Bhushan Punani
Nandini Rawal

Visual impairment handbook

Blind People's Association (India)

Vastrapur

Dedicated to

Shri Jagdish K. Patel
1928-1999

(Founder General Secretary: Blind People's Association)

Your Footprints will inspire posterity, your work and deeds will be ingrained in time....

ABOUT THE AUTHORS

Bhushan Punani is the Executive Director of the Blind People's Association, Ahmedabad and the Rehabilitation Consultant of the Sight Savers International (India). He is also a Member of the Rehabilitation Council of India Committee of Professionals in the Field of Visual Impairment, General Council of the National Institute for the Visually Handicapped, Dehradun, General Council of the Institute for the Physically Handicapped, New Delhi, Member of the Advisory Committee of the Sense International India and Member of the World Council of the Deafblind International.

He has been awarded Ph.D. by the Gujarat University during 1995. He completed an Advanced Vocational Rehabilitation Course from Haifa University, Israel during 1984.

Nandini Rawal is the Project Director of the Blind People's Association and Secretary of the Rural Activities Committee, National Association for the Blind. She is also Secretary of the International Council for the Education of the People with Visually Impairment. She is also Member of the CBR Forum.

Both the authors are Master in Business Administration and have been working in the field of development of innovations and administration of disability development programmes for the last 20 years. Their goal is to professionalize services for persons with disabilities and to promote comprehensive, need based and low cost services for persons with all categories of disabilities.

They have participated and presented papers in large number of seminars at the state, national and international on administration of services for persons with disabilities. They have published articles on employment, integrated education, community based rehabilitation, administration of disability strategies etc. in various Indian and foreign Journals and other publications.

They have coauthored the following books :

1. Manual : Social and Economic Rehabilitation of the Rural Blind
2. W. Stein and Integrated Education
3. Manual : Community Based Rehabilitation
4. Handbook : Visually Handicapped
5. Jagdish Patel - A Visionary

FOREWORD

I feel most privileged, happy for the opportunity to commend this precious publication. I have been closely associated with Bhushan and Nandini and the Blind Men's Association for the past 20 years. I have seen the changes in the BMA and have witnessed the effects of infusion of professional inputs in a traditional *"Blind School"*. The change of name from Blind Men's Association to Blind People's Association is in itself very significant. It reflects BPA's the dynamism and egalitarianism in the services offered to persons with disabilities. BPA has served as a laboratory for testing a wide range of innovative ideas by my two young friends. It is also their temple to worship God in various forms. They have tried to adapt traditional approaches to education and rehabilitation of persons with visual impairment. They have successfully introduced managerial aspects of commercial viability, accountability and overall performance in this field. This Handbook is a detailed outcome of the experience and expertise they have garnered over the past two decades.

I compliment the authors for making this document available at very reasonable price. Their selfless endeavour is to professionalise the field and raise its quality by enriching it with information which is crisp, concise, accurate and contemporary. The publication starts with the demographic details of visual impairment and goes on to give the legal and correct definitions of visual impairment. These two chapters should be useful not only for rehabilitational practitioners but also for medical professionals. The handbook deals with alternative systems of educating persons with visual impairment like special and integrated education as well as with different approaches to rehabilitation, including vocational counselling, assessment, vocational training, employment and income generating activities. The book documents of the various schemes and concessions available to persons with visual impairment and

a detailed note on the Persons with Disabilities Act. The publication presents information on braille, educational equipments and other rehabilitation tools.

I am sure that rehabilitation workers and/or special educators will find this Handbook eminently useful because of the simplicity of its language and production. It will also be useful to persons who require specific bits of information on various aspects of visual impairment at one place. The authors do not claim to provide solutions to all problems of rehabilitation and education but are confident that judicious application and understanding of concepts would yield tangible results.

I have no doubt that this Publication will serve for a long time as a valuable companion for all those who are concerned with health care and rehabilitation of the visually impaired.

Ahmedabad   **N.R. Sheth**

1 January, 2000

PREFACE

India has witnessed unprecedented changes in the field of rehabilitation in the past three decades. What began as a welfare activity is now considered a developmental activity. The concept of charity has been replaced by opportunity. The entire field has been presented with numerous challenges in the nature of politically correct language to be used in working with persons with disabilities; changes in the funding pattern by Governments and funding agencies, the changing face of the disabled population and most importantly their need to be involved in their own rehabilitation.

1995 saw the passing and enactment of the *"Persons with Disabilities [Equal Opportunities, Protection of Rights and Full Participation] Act, 1995"* and for the first time rehabilitation planners and persons with disabilities felt that they had a right to services rather than being passive recipients. The entire field is a different ball game altogether today. Rehabilitation workers, educators, teachers who began their work two decades ago will find that they need to rethink and replan their strategies.

My associates in the Blind People's Association (formerly known as Blind Men's Association), Dr. Bhushan Punani and Nandini Rawal started their careers after completing their Masters' in Business Management approximately 20 years ago. They have seen the ups and downs in the field, have seen the emerging of new concepts, new and unheard of disabilities, changing demographic patterns of disabilities amongst other things. They have been instrumental in planning all kinds of programmes - institutional and non-institutional and have helped in the setting up of self help groups of persons with disabilities and helped to professionalise the field and other organisations by conducting Human Resource Development Programmes.

The Handbook which is presented here is a complete analogy and spans all aspects of comprehensive rehabilitation including

prevention, education, demographic details self help skills. The Handbook is titled "HANDBOOK ON VISUAL IMPAIRMENT". The new definition of blindness and the new terms of visual impairment and low vision in place of partially blind, partially sighted, visually handicapped have been carefully explained and dealt with. There is also mention of visual impairment with additional disabilities, persons with deafblindness and persons with low vision.

If ever, one publication was to act as a sort of general guideline to a new entrant to the field of visual impairment, I would definitely vote for this publication.

Ahmedabad   Arvind N. Lalbhai

1 January, 2000   *President*

National Association for the Blind (India)

Blind People's Association Ahmedabad

Chairman
Arvind Mills Ltd.,

A C K N O W L E D G E M E N T S

Ahmedabad   **Bhushan Punani**
24 January, 2000   **Nandini Rawal**

CONTENT

GOVERNMENT OF INDIA

MINISTRY OF SOCIAL & WOMEN'S WELFARE

This National Award is given to

Blind Men's Association,

Ahmedabad (Gujarat)......

in public recognition of its outstanding

performance in the field of handicapped

welfare

New Delhi

Dated **13 May, 1985**

Secretary

to Government of India

CHAPTER I

DEFINITION : VISUAL IMPAIRMENT
(Expert comments: Ms. Karin van Dijk)
New Vision Consultant

1. Definition

In India, the broad definition of visual impairment as adopted in the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995 as well as under the National Programme for Control of Blindness (NPCB) is given below:

1.1 **Blindness :** refers to a condition where a person suffers from any of the following conditions, namely:

- Total absence of sight; or
- Visual acuity not exceeding 6/60 or 20/200 (Snellen) in the better eye even with correction lenses; or
- Limitation of the field of vision subtending an angle of 20 degree or worse.

For deciding the blindness, the visual acuity as well as field of vision have been considered.

1.2 Low Vision: The Persons with Disabilities Act, 1995 also recognizes low vision as a category of disability and defines it as follows:

"Person with low vision" means a person with impairment of visual functioning even after treatment or standard refractive

1

correction but who uses or is potentially capable of using vision for the planning or execution of a task with appropriate assistive device".

This definition is incomplete as it inadvertently omits quantification of the acuity as well as the field of vision as is done in the case of the WHO definition. It is desirable to modify this definition and the following quantification should be added:

> *"Low vision are those who suffer visual acuity between 20/200 to 70/200 (Snellen) or 6/18 to 6/60 in the better eye after the best possible correction or a Field of Vision between 20 to 30 degrees".*

The WHO working definition of Low Vision (WHO, 1992) is as follows:

> *"A person with low vision is one who has impairment of visual functioning even after treatment, and/ or standard refractive correction, and has a visual acuity of less than 6/18 to light perception or a visual field of less than 10 degrees from the point of fixation, but who uses, or is potentially able to use, vision for the planning and/or execution of a task".*

The points emphasized are that there is significantly reduced vision, visual performance is affected but that there still is vision that can be used. This last point is very important: if there is usable vision, training to use that vision might be possible. In addition, this person is not labelled blind.

Table 1.1

Categories of visual impairment

Category	Corrected VA-better eye	WHO Definition Standard*	Working#	Indian Definition
0	6/6-6/18	Normal	Normal	Normal
1	<6/18-6/60	Visual Impairment	Low Vision	Low Vision
2	<6/60-3/60	Severe Visual Impairment	Low Vision	Blind
3	<3/60-1/60	Blind	Low Vision	Blind
4	<1/60-PL	Blind	Low Vision	Blind
5	NPL	Blind	Total Blindness	Total Blindness

The standard WHO definition is used in medical reports and publications and is solely based on visual acuity and does not take into account functional vision.

 # The WHO working definition has been adopted since WHO Consultation in 1992. This working definition is solely used for reporting purposes and should not be used for eligibility of services.

The importance of the functional definition lies in the *'label'* people are given. Someone with a visual acuity of 2/60 can have useful vision, for example, for mobility. However, he or she will be labelled blind person. The consequence is this person

is than treated as if he/she is a blind. This ignores the usable vision. There should be a difference between legal blindness and functional blindness or low vision.

The WHO standard definition defines blindness as visual acuity of less than 3/60 in the better eye with the best possible correction as compared to that of 6/60 in India. The WHO functional definition, however, considers blindness starting at light perception or when a person has no usable vision. Similarly, a person with visual acuity better than 3/60 but equal or less than 6/60 is graded as "blind" in India, while WHO grades him as low vision.

In India a person with a VA < 6/60 is legally blind, which enables to receive certain services and financial benefits. However, a person who is legally blind can still have useful vision to do certain tasks, as can be seen in the working definition. This refers to the fact that they still have functional vision, which is the use of vision for a particular purpose.

For India or other developing countries, it is essential to maintain the legal definition of blindness at the level of visual acuity of 6/60 (20/200 Snellen) or less and field of vision of 20 degree or less. Already the travel concessions, scholarship and other benefits are very meagre, if *"perception of light"* to *"no perception of light"* is considered blindness, a large of persons who are at present availing these concessions would fall outside the eligibility criteria and thus remain bereft of these benefits. Alternatively, if these concessions are extended to all the persons with low vision in the acuity range of 6/18 to "perception of light" as defined by WHO, the appropriate Government may not be able to meet the demand due to financial constraints. For India and other developing countries, it is desirable to maintain the definition of blindness as adopted in the Persons

with Disability Act, 1995, i.e. visual acuity of 6/60 (20/200) or less and field of vision of 20 degree and less and to consider all the persons in the range of acuity of 6/18 to 6/60 (20/60 to 20/200) as persons with low vision.

Thus the recommended definition for low vision in Indian context should be *"Low vision are those who suffer visual acuity between 20/200 to 70/200 (Snellen) or 6/18 to 6/60 in the better eye after the best possible correction."*

1.3 One-Eyed Person: There is a controversy regarding the inclusion of one-eyed persons in the category of blindness. The definition of blindness adopted in India exclude people with impairment only in one eye from the purview of blindness. Even in medical parlance, disability is synonymous to the physical impairment and the level of such impairment has been prescribed for certifying a person to be disabled. Generally, the impairment of 40 percent or more is considered a handicap. As percentage of impairment in the case of a one-eyed person is only 30 percent, according to the approved definition in medical parlance, a person with one good eye is not a blind person. In short, a person with visual impairment of 40 per cent or more is considered a blind person.

The Committee of the Ministry of Social Justice and Emplowerment on Recommendation of Standard Definition of Disability recommended that one eye-eyed persons should be excluded from the other categories of visual impairment so that facilities and concessions available to severely and profoundly visually impaired persons are not eroded. The committee, however, felt that loss of one eye would not be considered as a disqualification on medical grounds unless a particular post is of such a technical nature that it requires of a person to have the coordinated use of both eyes or three dimensional vision.

1.4 Persons with Deafblindness

Deafblindness is a condition presenting other difficulties than those caused by deafness and blindness. It is an "umbrella" term which can include children and adults who may suffer from varying degrees of visual and hearing impairment, perhaps combined with learning difficulties and physical disabilities, which can cause:

- severe communication
- developmental, and
- educational problems.

It includes children and adults who are:

- blind and profoundly deaf
- blind and severely or partially hearing
- partially sighted and profoundly deaf
- partially sighted and severely or partially hearing

(Source : Contact (1993) A Resource for Staff Working with Children who are Deaf and Blind, Edinburgh: Moray House)

2. Explanation of Various Terms

In defining visual impairment, three aspects of vision namely visual acuity, field of vision and visual functioning are considered simultaneously. In a broad sense, visual defects result into loss of clear vision, central vision or peripheral vision.

All these losses are considered by measuring visual acuity, field of vision and level of visual functioning.

2.1 Visual Acuity : It refers to the ability of the eye to see details. The visual acuity for distance is measured as the maximum distance at which person can see a certain object, divided by the maximum distance at which a person with normal eyesight can see the same object. Thus a visual acuity of 6/60 means that the person examined cannot see, at a distance of 6 meters, the object which a person with normal eyesight would be able to see at 60 meters. If vision is so impaired that to see the biggest E of the E-chart, the person has to come within 6 meters or even nearer, he is considered blind. The simplest method of testing visual acuity is to see whether the person can count fingers at a distance of six meters.

6 Mts.
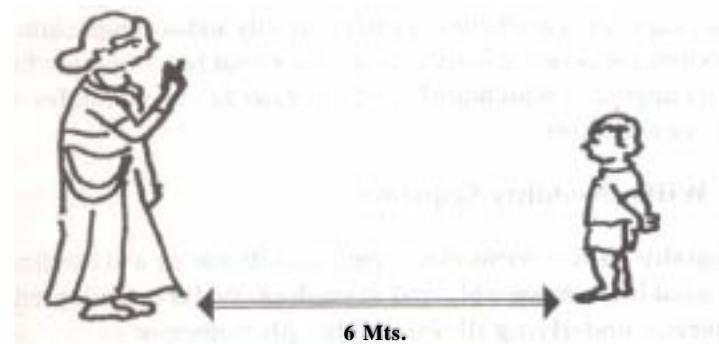
Fig. 1.1 : Finger Count

6 Mts.
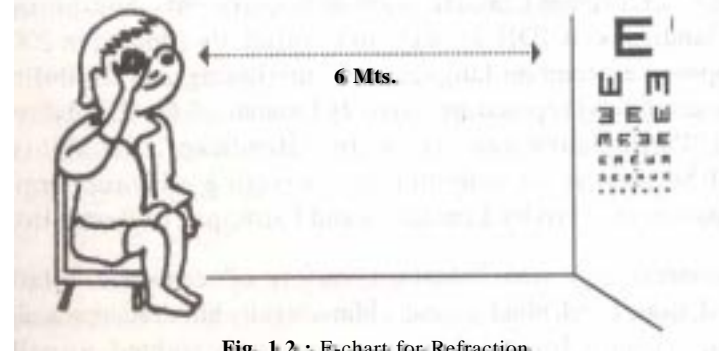
Fig. 1.2 : E-chart for Refraction

2.2 Field of Vision : It refers to the field which both the eyes can easily see in the front. The normal field of vision is 180 degrees in front of eye. It is determined by the Confrontation Test in which mapping is done on a chart having concentric circles marked upon it. The simplest method of testing is to bring snapping finger from the side of the ear to the front, move it up and down, and mark the position where the person can see the finger.

2.3 Visual Functioning : It relates in part to the condition of the eye. It is determined by the experience, motivation, needs and expectation of each individual in relation to whatever visual capacity is available to satisfy curiosity and accomplishment activities for personal satisfaction. The visual functioning refers to the degree to which/ability of a person to use vision for all (daily) activities.

3. WHO Disability Sequence

Generally various terms like impairment, disability and handicap are used interchangeably and at random. WHO has adopted a sequence underlying illness-related phenomenon as:

Disease ——> Impairment ——> Disability ——> Handicap

The International Classification of Impairments, Disabilities & Handicaps (ICIDH-2) likely to be officially adopted in 2001 proposes a common language of functioning and disability. The new terms proposed are "Activity Limitation" for "Disability"; and "Participation Restriction" for "Handicap". "Disability" will be used as an umbrella term covering all three terms: Impairment, Activity Limitation and Participative Restriction.

In context of vision defects, a variety of terms viz. totally blind, stone blind, blind, partially blind, legally blind, economically blind, visually limited, low vision, partially sighted, visually handicapped, visually impaired etc. are being used.

Table 1.2

Explanation of Various Terms as Adopted by WHO

Condition	Concerned with	Represents
Impairments	Abnormalities of body structure and appearances; organs or system functioning	Disturbances at organ level
Disabilites	Impairment in terms of functional performance and activities	Disturbances at personal level
Handicaps	Disadvantages resulted from impairment and disabilities	Interaction with and adaptation to individual's surroundings

Source: WHO Classification of Impairments, Disabilities & Handicaps

The visually impaired is an umbrella term, used widely and understood in an educational context. This term is used to describe the total group of persons whose vision is affected by impairments in seeing, irrespective of the nature or extent of these. The term refers to all the persons where vision disadvantage has resulted from impairment as well as disabilities.

In case of persons who are completely without vision, or who have light perception only, it is desirable to use the term *"blind"*. In all other cases of visual defects falling in the definition, the term *"visually impaired"* should preferably be used. For the persons who do not fall in the category of blindness as defined in the Act and whose visual acuity falls between 6/18 and 6/60 in the better eye after the best possible correction, the term *"low vision"* should be used.

In addition, the following should be done:

a. Use the term "blind" (VA 6/60 or lower) only for legal reasons or to get benefits.

b. For educational and rehabilitation purposes, all persons with a visual acuity <6/18 to light perception, who still have useful vision, should be labelled "low vision, not blind" so as to encourage the use of vision.

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CHAPTER II

CAUSES, PREVENTION AND CURE OF VISUAL IMPAIRMENT

[Expert comments: Dr. Vandana Nath, M. S. (Ophth.)]

1. Structure and Functions of the Eye

Each eyeball, about 2.5 cms. in diameter, is lodged within the socket called orbit. Between the orbital wall and the eyeball, there are several structures viz.

- *the voluntary muscles*
- *fat*
- *connective tissue*
- *lacrimal glands.*

All these structures are separated from the eyeball by a fascia called Buck's fascia. The voluntary muscles are concerned with the movement of the eyeballs. The lacrimal glands produce a fluid called tears.

The functions of tears are:
- *to maintain optical properties of the eye*
- *to wash away many irritants which may fall on the eyes*
- *to act as an disinfectant (as it contains lysozyme)*
- *to express emotions.*

Three coats of the eyeball are:
- *the outer coat, consisting of sclera and cornea*
- *the middle coat, called the uvea or vascular coat*
- *inner coat, called the retina.*

Sclera forms the outermost wall of the eyeball and is the white of the eyeball. It is composed of a dense, imperfectly elastic

supporting membrane. It helps to maintain the shape of the eye and supports the delicate structure within the eye

Conjunctiva is a thin clear mucous membrane which covers the front of the Sclera and is reflected from its surface on to the lids. It covers the interior surface of lids and joins them to the eye ball.

Cornea is the anterior part of the elastic supporting membrane of the globe which is transparent and clear. It is set into the sclera like a watch glass so that the latter overlaps the cornea all round the periphery. It is kept moist by a layer of tear film anteriorly and bathed on its posterior surface by aqueous humour. It permits light to pass through and helps focussing it on the retina along with the lens.
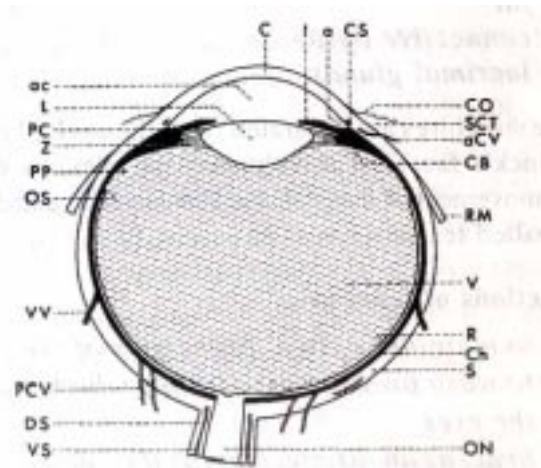
Source : Stephen J. H Miller (1990), Parsons' Diseases of the Eye, New York, Churchill Livingstone, P. 4

Fig. 2.1 : Diagram of a longitudinal section of the eyeball: a, angle of anterior chamber; ac, anterior chamber; aCV, anterior ciliary vessel; C, cornea; CB, ciliary body; Ch, choroid; CO, ocular conjunctiva; CS, canal of Schlemm; DS, dural sheath; I, iris; L, lens; ON, optic nerve; OS, ora serrata, PC, posterior chamber; PCV, posterior ciliary vessel; PP, pars plana; R, retina; RM, rectus muscle; S, sclera, SCT, sub-conjunctival tissue; V, vitreous; VS, vaginal sheath; VV, vortex vin; Z, zonule.

Uveal Tract: Lining the inner aspect of the sclera is a highly vascular middle layer of the eyeball, the uveal tract, concerned chiefly in the nutrition of the eye. It consists of three parts:

- *an anterior most part, the iris*
- *an intermediate part, the ciliary body,*
- *posterior most part, the choroid which accounts almost 2/3rd of the middle coat.*

Iris is the black disc beneath the cornea. The posterior surface of the iris is pigmented. The colour of the iris decides the colour of the eye. The muscles in the iris make the pupil larger or smaller.

Pupil is the black hole in the centre of the iris. The pupils look black due to the darkness of the interior of the eye. It controls the amount of light entering the eye. In bright light, the circular muscles of the iris contract and the pupils become smaller to reduce the amount of light that enters the eye. In the dark, the dilator muscles help the pupil to widen, allowing more light to enter the eye.
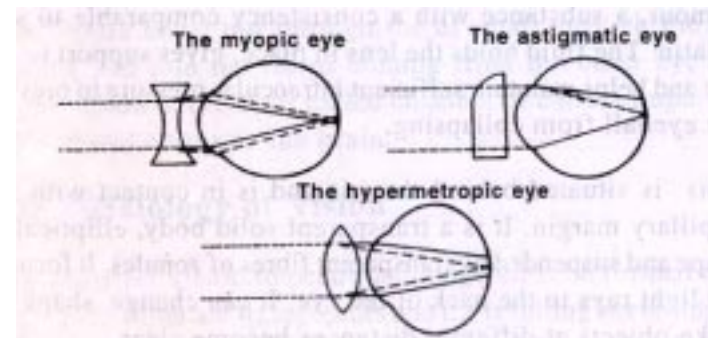
Source : Chapman and Stone's The Visually Handicapped Child in Your Classroom

Fig. 2.2 : Refractive Errors.

Cavity: The eyeball is not a solid sphere but contains a large interior cavity that is divided into two cavities, anterior and posterior. The anterior cavity has two subdivisions known as the anterior and posterior chambers.

Anterior Chamber is a space filled with fluid. It is bounded in front by the cornea, behind by the iris and part of the anterior surface of the lens which is exposed in the pupil. Its peripheral recess is known as the angle of anterior chamber which is concerned with the drainage of aqueous humour. The anterior chamber is 2.5 mm deep in the centre in the normal adults. It keeps the posterior surface of the cornea moist. It provides nutrition to the cornea and lens.

Posterior Chamber is the triangular space between the back of the iris and anterior surface of the lens and bounded on the outer side by ciliary body. It is filled with a jelloid substance, the aqueous humour which is clear and watery and often leaks out when the eye is injured.

Posterior cavity of the eye ball is considerably larger than the anterior, since it occupies all the space posterior to the lens, suspensory ligament and ciliary body. It contains vitreous humour, a substance with a consistency comparable to soft gelatin. The fluid holds the lens in place, gives support to the eye and helps maintain sufficient intraocular pressure to prevent the eyeball from collapsing.

Lens is situated behind the iris and is in contact with the pupillary margin. It is a transparent solid body, elliptical in shape and suspended by transparent fibres of zonules. It focuses the light rays to the back of the eye. It can change shape to make objects at different distances become clear.

Retina is the innermost coat of the eyeball. It is a nervous layer within uveal tract. It mainly consists of nervous tissues and three layers of neurons viz.

- *photoreceptor neurons*
- *bipolar neurons, and*
- *ganglion neurons.*

The distal ends of the dendrites of the photoreceptor neurons are called rods and cones, descriptive of their shapes. These nerve endings are concerned in the reception and transformation of the light stimuli into electrical impulses.

Macula is the most sensitive part of the retina. The cones and rods differ as to numbers, distribution and function. The cones are most densely concentrated in a specially differentiated spot, fovea centralis, found near the centre of the retina, It is surrounded by a small area, the macula lutea or yellow spot. It is used for activities that need fine vision like reading and writing. It contains the greatest concentration of cones and is, therefore, the point of clearest vision in good light. The cones become less and less dense from the fovea outward. Rods, on the other hand, are absent entirely from the fovea and macula and increase in density toward the periphery of retina.

Optic Nerves: The fine fibres arising from each nerve cell in the retina come out through the eye ball through the optic nerve and join the fibres coming from the other eye at an interaction in the skull called chiasma. It carries impulses to the visual cortex in the brain.

2. Physiology of Vision

In order for vision to occur, an image must be formed on the retina to stimulate its receptors and the resulting nerve impulses must be conducted to the visual area of the cerebral cortex.

2.1 Formation of Retinal Image : Four process are essential for forming a clear image on the retina:

- i. *Refraction of the light rays*
- ii. *Accommodation of the lens*
- iii. *Contraction of the pupil*
- iv. *Convergence of the eyes*

2.1.1 Refraction of the Light: It refers to deflection or bending of light rays. The refracting media of the eye are cornea, aqueous humour, lens and the vitreous humour. The light rays are reflected at the anterior surface of the cornea, at the anterior surface of the lens and the posterior surface of the lens.

Refraction in ophthalmology refers to measuring the refractive or light bending power of a person's eyes by various specially designed methods.

2.1.2 Accommodation of the Lens: If while looking at an object, situated at infinity, the gaze be transferred to an object near at hand, some readjustment of the power of the crystalline lens will have to occur, otherwise the image will fall behind the retina. This adjustment of the power of the lens is called accommodation. It requires three changes:

  i. *Increase in the curvature of the lens*
  ii. *Constriction of the pupils, and*
  iii. *Convergence of the two eyes*

During accommodation, the ciliary muscles contract and this causes relaxation of the suspensory ligament and thus the anterior surface of the lens bulges and its power increases. Through this mechanism, the images focus nearer so that it is on the retina.

2.1.3 Constriction of the Pupil: As a part of accommodation mechanism, the circular fibres of the iris contract and that constricts the pupil. This prevents divergent rays from the object from entering the eye through the periphery of the cornea and lens. Such peripheral rays could not be refracted sufficiently to be brought to a focus on the retina and, therefore, would cause a blurred image. The pupil constricts also in bright light to protect the retina from too intense or too sudden stimulation.

2.1.4 Convergence of the Eyes: Convergence is the movement of two eyeballs inward so that their visual axes come together or converge at the object viewed. The nearer the object, the greater the degree of convergence necessary to maintain single vision.

2.2 Stimulation of Retina : The rods are known to contain rhodopsin (visual purple), a pigmented compound. It is highly light sensitive, so that when light rays strike a rod, its rhodopsin rapidly breaks down. This chemical change initiates impulse conduction by the rod. Then, if the rod is exposed to darkness for a short time, rhodopsin reforms from the opsin and is ready to function again. For this reason, when we want to see an object clearly in the daytime, we look directly at it so as to focus the image on the fovea. But in dim light or darkness, we see an object better if we look slightly to the side of it, thereby focusing the image nearer the periphery of the retina, where rods are more plentiful.

2.3 Conduction to Visual Area : The visual pathways consist of optic nerve, optic chiasma, lateral geniculate body of thalamus, optic radiation (optic tract), and the visual cortex of occipital lobe. Fibres from nasal portion of retina that conduct impulses from the rods and cones to visual cortex cross over to opposite side at optic chiasma, hence terminate in lateral geniculate body of opposite side. Thus each optic tract contains fibres from both the retinas. The result is that some information from each eye in the normal vision system arrives on each side of the brain.

3. Refractive Errors

The normal eye is called emmetropic. When a person with emmetropic eye gazes at infinity (20 feet or more), the rays incident to the eye are parallel and after refraction those rays are focussed on retina, i.e. image is formed on retina. While the abnormal condition is called errors of refraction or ametropia.

Ametropia: The condition in which incident parallel rays of light do not come to a focus upon the light-sensitive layer of the retina, may be due to one or more of the following conditions:

- *Abnormal length of the globe - axial ametropia*
- *Abnormal curvature of refracting surfaces of cornea or lens - curvative ametropia*
- *Abnormal refractive indices of the media - index ametropia.*
- *Abnormal position of the lens.*

The defects may also arise due to weakening of the eye muscles. The uncoordinated action of the muscles causes the failure of the visual axes of the two eyes to meet at the objective point. This results into squint.

Due to refractive errors, the lenses do not focus the rays correctly on the retina. The lenses focus light rays either behind or in front of it. The common refractive error are:

- *Myopia (Short-sightedness)*
- *Hypermetropia (Far-sightedness)*
- *Astigmatism*
- *Presbyopia*

3.1 Myopia (Short-sightedness): It is that diopteric or dioptric condition of the eye in which, with the accommodation at rest, the incident parallel rays of light come to a focus anterior to the light sensitive layer of the retina. Thus the image formed is not sharp and distant objects appear blurred to the person.

a.   Causes
- *Anteroposterior diameter of the eye is longer than normal.*
- *Distance too great from the lens to the retina.*

b.   Symptoms
- *Person is near-sighted i.e. the person can see near things   clearly but has difficulty in seeing distant objects.*
c.   Signs
- *Squinting or narrowing of the eye-lids*
- *Sitting very close to black-board, television or other   visual objects*
- *Lack of interest in out-door activities*
- *Taking objects nearer to the eye.*
- *'Out of step' with the rest of the class*
e.   Risk
- *Further visual deterioration from muscular haemorrhage or retinal detachment.*
d.   Diagnosis
- *By a complete optometric examination*
- *Observant teachers and parents may discover it by observing the behaviour.*
e.   Correction
- *Needs a concave or minus corrective lens in glasses or contact lenses to help the eye to focus light rays on the retina.*
- *Visual training depends upon degree, type and vision problems associated with this condition.*
f.   Prevention
- *No certain prevention*
- *Best recommendation is observance of the rules of good health and regular optometric examination.*

3.2 Hypermetropia(Far-sightedness) : Hypermetropia is that diopteric or dioptric condition of the eye which, with the accommodation at rest, incident parallel rays come to a focus posterior to the light sensitive layer of the retina. Thus distant objects are seen clearly while near objects are not seen clearly.

a. *Causes:*
- *Antero-posterior diameter of the eye is shorter than normal.*
- *Distance too short from the lens to the retina.*

b. *Symptoms*

In the young children, the condition may cause no symptoms. When the following symptoms arise, the condition is often called accommodative asthenopia or eye-strain.

- *General fatigue after prolonged use of the eye*
- *Difficulty in concentrating & maintaining clear vision in reading.*
- *Burning eyes, headache*
- *Irritability or nervousness after sustained visual concentration and even nausea.*

c. *Signs*
- *In young children, hypermetropia, is a predisposing cause for convergent squint.*
- *Reading material is held at a further distance than usual in order to be seen clearly.*

c. *Detection*
- *By a complete optometric examination*
- *Observant teacher and parents are very important in early detection.*

d. *Correction*
- *Prescribing convex or plus corrective lenses in glasses or contact lenses to help to focus light rays on the retina.*
- *Visual training depending upon degree, type and vision problems associated with this condition.*

3.3 Astigmatism : In this condition, the eye has a misshapen curve referred as curvature ametropia. It produces a distorted image on the retina which causes another very troublesome refractive error called astigmation. In most of these cases, the cornea is at fault and the error is generally of such a nature that its surface is flatter from side to side than it is from above downwards. Thus the image formed on the retina is blurred.

a. *Symptoms*
- *Eyestrain*
- *Aching of the eyes, headache*
- *Eyes quickly become fatigued with reading*
- *Letters are described as running together*
- *Copying incorrectly.*
- *Failure to see all the lines of a diagram simultaneously*

b. *Treatment*
- *Full optical correction for constant use for both distant and near vision*
- *Glasses with cylindrical lenses*

3.4 Aphakia : This is the condition of the eye when the crystalline lens has been removed. The eye is extremely hypermetropic and all accommodation is lost.

a. *Correction*
- *Strong correcting lenses or contact lenses or intraocular lenses.*

3.5 Presbyopia : The crystalline lens at the age of 40 years and above becomes rigid, so that, during accommodation, even though the ciliary muscles are contracting, it is unable to change its shape to focus near objects. Light is formed behind the retina and the near point of the eye recedes.

a. *Symptoms*
- *Difficulty in reading, sewing or near work*
- *Cannot see printed words or small objects when held at 'usual' distance for reading*

b. Correction

- *Appropriate 'reading glasses', that is, convex lenses for doing near work.*

3.6 Refractive Errors of Normal Eyes : The errors of refraction described above are all examples of pathological conditions. Even in normal persons, following errors may be seen:

- *Spherical aberration, and*
- *Chromatic aberration*

3.6.1 Spherical Aberration: Even in a normal person, the power of lens at the extreme of periphery, is not identical with the power in its central part. Therefore, when the pupil is widely dilated - in darkness or after administration of atropine - some blurring of vision may occur and is called spherical aberration.

3.6.2 Chromatic Aberration: The rays of the different wave length are refracted differently at the periphery of the lens of the eyes, causing what is known as chromatic aberration. As red light is refracted least whereas the violet light the most and consequently on looking at a source of white light, the red light falls posterior to and the blue light anterior to the retina.

4. Major Causes of Visual Impairment

Many conditions can contribute to the impairments of the eye structures and tissue. Whether such impairment leads to limitations in visual functioning, however, depends upon such factors as:

- *Site, type, etiology and severity of tissue damage*
- *Age of individual at the time the problem occurred*
- *Nature and quality of treatment*
- *Extent of follow-up*

Site refers to location within the orbit or globe; type indicates the diagnosis; and etiology refers to the cause of eye affection. The figures in Table 2.1 point out the causes of blindness, based on definition of 6/60 (20/200 Snellen) or less in better eye after all correction.

4.1 NPCB - WHO Survey : Two major surveys have been conducted in India and they provide data on causes and prevalence of visual impairment in India: one by India Council of Medical Research in 1971 and second by WHO -NPCB in 1986. The first observation of these surveys is that the prevalence of blindness in India has increased from 1.38 percent in 1971 to 1.49 percent in 1986. Secondly, blindness due to cataract has increased from 55 percent in 1971 to 81 percent in 1986.

Table 2.1

Causes of Visual Impairment in India (NPCB - WHO survey)

S.N.	Causes of Blindness	ICMR Study (%)	WHO-NPCB Survey (%)
1.	Cataract	55.00	81.00
2.	Refractive Errors	-	7.00
3.	Corneal Opacity	-	3.00
4.	Glaucoma	0.50	2.00
5.	Trachoma	5.00	0.20
6.	Malnutrition	2.00	0.04
7.	Other Infections	15.00	-
8.	Small Pox (Old Cases)	3.00	-
9.	Injuries	1.50	-
10.	Others	18.30	6.76
	TOTAL	**100.00**	**100.00**

Source: NPCB Publications

The WHO - NPCB Survey 1981-86 also made the following projections.

ICMR STUDY 1971-74   **WHO-NBCB SURVEY 1981-86**
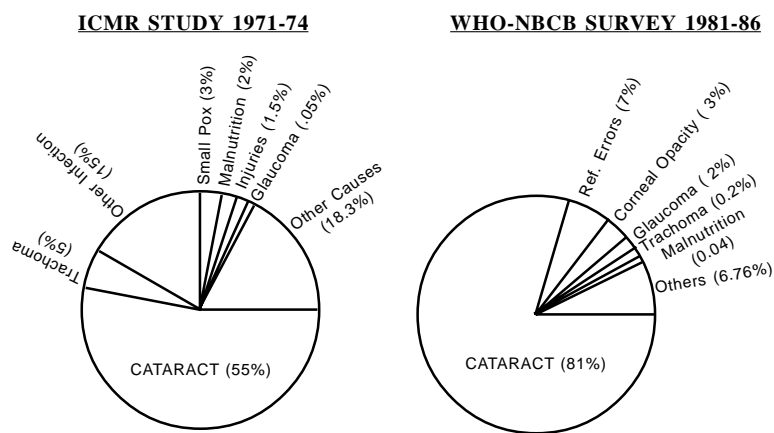
Fig. 2.3 : Causes of Visual Handicap

4.2 NSSO Survey : The NSSO Survey (1992) establishes that the old-age and cataract are the major causes of visual impairment.

Table 2.2

Major causes of visual impairment (NSSO survey)

(Distribution per 1,000)

S.N.	Cause of Visual Impairment	Distribution per 1,000 (Rural)	(Urban)
1.	Old age	273	214
2.	Cataract	236	280
3.	Other eye diseases	130	107
4.	Injuring other than burns	32	35
5.	Glaucoma	34	42
6.	Smallpox	29	35
7.	Severe diarrhoea	11	13
8.	Not known	161	130
9.	Others	94	144
	Total	**1000**	**1000**

The National Sample Survey reveals that old-age is the major cause of visual impairment in the rural areas which accounts for 27 percent visual impairment. Whereas cataract is its major cause the urban areas with 27 percent visual impairment. Almost 50 percent of visual impairment both in rural as well as urban areas is caused due to old-age and cataract. The survey could not establish any definite cause in case almost 25 percent and 27 percent for the rural and urban areas respectively.

The WHO- NPCB Survey establishes that cataract causes 81 percent of visual impairment in the country. Majority of cases which reported that the cause of visual impairment as old-age at the time of National Survey might have lost vision due to cataract. While both the National Sample Survey as well as WHO - NPCB establish cataract as one of the major causes, the findings of these surveys have shown lot of disparities as regard other causes of visual impairment.

4.3 NationalLoad : The National load for leading causes of blindness in India at the population level of 800 million is as given below:

Table 2.3

National Load

Cause of Blindness	National Load in Million
Cataract	25.76
Refractive Errors	2.24
Corneal Opacity	1.09
Glaucoma	0.63
Trachoma	0.08
Vitamin A Deficiency	0.01
Others	2.03
Total	**31.84**

Source : WHO - NPCB survey

4.4 Prevalence Rate of Blindness

Table 2.4

Prevalence Rate of Blindness

Eyes	Prevalence Rate	Estimated Numbers (at 800 million Pop.)
Both Eyes	1.49%	11.92 million
One Eye	0.92%	7.84 do
Eyes	1.99%	31.84 do

Source : WHO - NPCB Survey

4.5 Rural - Urban Distribution

Total of Economic Blindness : 1.49%
Rural : 1.62%
Urban : 1.03%

Incidence of blindness is higher in rural areas as compared to urban areas.

4.6 Curable and Incurable Blindness

Table 2.5

Extent of Curable Blindness

	Surgically Curable	Non-surgically Curable	Incurable	Uncertain Prognosis
National Projections	77.43%	10.63%	5.99%	5.99%
National Load in Million	17.0	2.35	1.32	1.32

Source : WHO - NPCB Survey

The backlog of curable blindness in the country at the population level of 800 million is 19.35 million i.e. these surgeries are pending and hence have resulted in the suffering persons becoming blind. The current estimated rate of cataract surgery per annum in the country is 1.2 million (1990 level, reported to be 2.7 million during 1998) only. Whereas incidence of cataract alone is between 2.97 million to 4.67 million. Thus only 40 per cent of the persons who suffer in any single year are covered. The remaining 60 per cent are added to the cataract backlog which stands at 19.35 million.

With increasing longevity, the incidence of eye diseases and disorders is on the rise, whereas increase in facilities for eye care and eye surgery have not kept pace with the increasing incidence. This has resulted into an increasing backlog of eye surgery, incidence of blindness as well as prevalence of blindness.

5. Classification of Causes of Visual Impairment

The simplest classification of causes of visual impairment is:

- *Ocular Diseases and Anomalies*
- *General and Systemic Diseases*
- *Injuries and Accidents*

5.1 Ocular Diseases and Anomalies:

a. Buphthalnos: It is infantile glaucoma, one of the rarest conditions in children. As infant's eye is elastic, increased eye-ball pressure causes the eye to enlarge. It occurs mostly due to failure of development of tissues in region of anterior chamber. It results into excessive watering, photophobia & cornea becomes cloudy. Due to altered shape of eye, refractive errors may occur.

b. Albinism: This is a hereditary condition involving defective development of pigment in hair, skin & eye. In 'ocular albinism', only eyes are affected. The amount of pigmentation may increase slightly with age up to adolescence and that results into improvement into visual acuity.

i. Signs
- *Associated with photophobia, decreased visual acuity, nystagmus and refractive errors.*
- *Difficult going outside on a bright day*
- *Any glare would cause difficulty*

ii. Precautions
- *Such children not to be seated near windows*
- *Level of lighting may be adapted*
- *Need glasses to help their distant vision*
- *Genetic counselling to the teen-agers*

c. Retinitis Pigmentosa: A hereditary slow degenerative disease of the retina. The condition affects the peripheral area of retina including rod cells. It may result into night blindness, tunnel vision and inability to see in dark. Though some children are born with poor vision, it begins in childhood. It is progressive and results into blindness in middle or advanced age. Visual acuity is often normal, the field of vision is so poor that the person falls in the category of blindness. It is also associated with other diseases including hearing loss.

Precautions
- *A close watch by parents and teachers to note any changes in the vision.*
- *Sympathetic and proper handling and understanding of socio-psychological and behaviour problems of the individual.*
- *Training in visual skills of scanning and reorientation.*
- *Training in orientation & mobility*
- *Genetic counselling of the individual.*

d. Retinoblastoma: This is malignant tumour of the retina. It is generally confined to infants, probably always congenital and some cases are heredity. It is often a bilateral condition and both the eye balls may have to be removed.

Treatment
- *Treated by radiation or photo-coagulation*
- *Generally surgery is necessary to remove the affected eye.*
- *Genetic counselling is desirable.*

e. Retrolental Fibroplasia: It is associated with pre-mature birth children who have been given high concentration of oxygen. It is caused due to formation of new vessels and proliferation of fibrous tissue in the retina. As it results into formation of a membrane in the back of the lens of the eye, vision is fragmented. It is usually a bilateral condition. There is a risk of further visual deterioration from retinal detachment or glaucoma.

f. Retinal Detachment: It refers to separation of the retina proper from its pigment epithelium layer. From the clinical point of view, it is divided into 2 classes:

i. Secondary detachment - due to an obvious mechanical cause, subsequent to other happenings in the eye
ii. Simple detachment - due to development of a hole in the retina.

It is caused by degenerative myopia, diabetes, diabetic retinopathy. It leads to painless loss of vision, appearance of flashing lights, visual field loss and decreased visual acuity. It is generally treated by laser surgery and cryosurgery.

g. Diabetes Mellitus: It is a hereditary disorder and affects retina. Also known as diabetic retinopathy and it is common

after the diabetes has lasted for 10 years. Due to this, senile cataract develops at an earlier age and more rapidly than usual. It leads to fluctuating vision, loss of colour vision, or visual field, refractive error, decreased visual acuity. It is treated medically, along with dietary control, spectacle correction and laser therapy for retinopathy.

h. Trachoma: It is a chronic contagious disease of the conjunctiva and cornea caused by an organism chlamydia. The primary infection affects conjunctiva and follicles and corneal involvement causes ulcers. As lid deformities cause misdirected eyelashes, further complications take place. It can be treated with medication & surgical correction of deformed lids.

i. Glaucoma: It is caused by an obstruction in aqueous outflow channels at angle of anterior chamber. It also results in the rise in intraocular pressure which is detrimental to the eye. It is usually a hereditary, symptomatic condition.

j. Cataract: In Latin, word 'cataract' means waterfall that explains appearance of the eye when lens becomes cloudy and opaque. It refers to loss of transparency of the lens due to altered physio-chemical processes within tissues. It is usually associated with advanced age. If present at birth, it is referred as congenital cataract. It may be associated with:

- *Oculardisease, e.g.complicated cataract*
- *Systemic disease, e.g. diabetes mellitus*
- *Radiant energy, e.g. infra-red or radiation cataract*
- *Injury.*

5.2 General and Systemic Diseases : Many general and systemic diseases that effect the vascular and metabolic systems put the eyes at risk. Major diseases which may result into visual impairment are:

a. Hypertension: Vascular retinopathy is associated with raised blood pressure along with pronounced degenerative changes in the retinal vessels. The circulatory changes lead to development of retinal edema.

b. Vitamin A Deficiency: Vitamin A is essential for the build up of the surface tissues in our body, including eye. Vitamin A deficiency may lead to corneal damage, ulceration and blindness, particularly in combination with measles or malnutrition.

It is also known as:
- *Xerophthalmia*
- *Blinding malnutrition*
- *Disease of darkness.*

Causes
- *Insufficient and unbalanced food intake by the mothers and the children*
- *Low absorption due to diarrhoea or malnutrition*
- *Increased demand of Vitamin A during and after measles infection*
- *Vitamin A deficiencies owing to interference with the reformation of the visual purple leads to:*
  * *Xerosis of the conjunctiva*
  * *Keratomalacia and*
  * *Night blindness*

d. Chronic Diarrhoea: It is a cause of blindness in rural areas. Generally loss of vitamin A leads to softening of cornea which results into Keratomalacia.

e. Multiple sclerosis, thyroid gland disorders, certain vitamin deficiencies,and other systemic diseases can lead to eye problems with vision loss.

5.3 Injuries and Accidents : Injuries, accidents and poisonings account for many known instances of visual impairment among school age groups. Actually, injuries and accidents are not considered a major cause of blindness since technically both eyes would have to be severally affected. The injuries are a major cause of preventable, curable and monocular visual impairment. Most common injuries and accidents are:

- *Traumatic and chemical injuries*
- *Lodging of foreign body in the eye*
- *Chemical burns*

6. Early Intervention

In case of visual impairment, early eye examination is of utmost importance. All eye surgeons have been exposed to the frustration of an adult when told that nothing can be done to improve vision in the lazy (amblyopic) eye. This can be prevented to a great extent in majority of cases if it can be detected around the age of 3-4 years.

It has been observed that 24 percent persons have refractive errors and many of these errors are present at birth and go un-noticed for a long time until the person is quite old. It happens more often when errors are more in one eye than the other.

Signs to watch for early detection: *(As adopted by UNICEF)*

General symptoms that may occur from birth:

- *The child squints or blinks when looking at something.*
- *The child's eyes are crossed.*
- *The child favours one eye more than the other when looking at an object.*
- *One or both of the child's eyes turn in or out.*
- *The child's pupils are hazy.*
- *The child's eyes are tearing excessively, are red, or the eye-lids are encrusted with matter.*
- *The child turns or tilts his head abnormally.*
- *The child has frequent or persistent sties.*

0-3 Months:
- *Infant does not follow an object in his visual field.*
- *Infant does not play with his hands.*

3-6 Months:
- *Baby does not reach for toys in his visual field.*
- *Baby does not make eye contact when being fed or cuddled.*
- *Baby does not visually inspect objects in his hand.*

6-9 Months:
- *The motor skills of a baby do not develop such as rolling over, sitting or crawling.*
- *Baby does not appear to discriminate between similar objects or people.*
- *Baby does not pick up small objects successfully.*

9-12 Months:
- *Baby shuts or covers one eye when focussing.*
- *Baby holds playthings very close to eyes.*
- *Baby bumps into large objects when crawling.*
- *Baby rubs his eyes excessively.*
- *Baby does not attempt to grasp spoon or cup when being fed.*
- *Baby does not appear to notice interesting or bright coloured objects that are at a short distance.*
- *Baby does not imitate simple motor play such as waving bye bye.*

1-2 Years:

- *Child's walking is delayed.*
- *Child bumps into large objects.*
- *Child is not interested in playing.*
- *Child is 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 is clumsy and awkward for his age.*

2-5 Years:

- *Child stumbles over small objects.*
- *Child bumps into large objects, is clumsy and awkward.*
- *Child is not interested in games involving catching, throwing, bouncing or tagging.*
- *Child is not interested in tasks that require sustained visual concentration.*
- *Child is not interested in books.*
- *Child complains of: headaches, nausea, dizziness, burning or itching of eyes, blurring of vision.*
- *Child can not see distant things clearly.*
- *Child places head close to the tasks he is doing.*
- *Child does not notice colour differences.*

School Age:

Teacher or parent may observe:

- *Child's body is rigid while looking at distant or near objects.*
- *Child has short attention span and daydreams.*
- *Child places head close to book or desk when colouring, reading or writing.*
- *Child uses unusual or fisted pencil grasp, frequently breaking pencil.*
- *Child has a spidery, excessively sloppy, or very hard to read handwriting.*
- *Child closes or covers one eye.*
- *Child dislikes tasks requiring sustained visual concentration; is nervous, irritable, restless or unusually fatigued after maintaining visual concentration.*
- *Child loses place while reading and uses the finger or marker to guide the eyes.*
- *Child has difficulty in remembering what is read.*
- *Child skips words and re-reads.*
- *Child has difficulty remembering, identifying, and reproducing basic geometric forms.*
- *Child has difficulty in sequential concepts.*
- *Child has poor eye-hand co-ordination and unusual awkwardness including difficulty with stairs, throwing and catching ball, buttoning and unbuttoning and tying.*
- *Child is easily frustrated, is withdrawn and has difficulty getting along with children.*

7. Prevention and Cure of Visual Impairment

As xerophthalmia, cataract, trachoma, glaucoma and diabetic retinopathy are the most common causes of visual impairment, important steps to be taken to help prevent the same are mentioned below:

7.1 Prevention and Cure of Xerophthalmia :

a. *Complaint*
- *The patient is usually a pre- school child, who may be sick, specially with diarrhoea or measles*
- *Poor vision*
- *Night blindness*
- *Difficulty seeing in dim light*
- *Eyes become sensitive to bright light*

Source :Ophthalmology Section, Directorate General of Health Services (1996), National Programme for Control of Blindness, P. 14.

Fig. 2.4 : Vitamin A Defficiency (Xerophthalmia)

b. *Signs*
- *A line or spot on the conjunctiva*
- *Thick white spots on both sides of the cornea*
- *Conjunctiva becomes wrinkled*
- *Cornea erupts*
- *Scar forms over cornea*
- *Scar is opaque and impairs vision while the eyeball shrinks causing complete blindness*

c. *Examination and findings*
- *Cornea appears dry, rough and cloudy*
- *The child may be poorly nourished and sick*
- *See if the child can fix and follow an object such as your hand*

d. *Action to be taken*
- *Immediately- give oral 200,000 IU vitamin A*
- *Apply antibiotic ointment (twice daily)*
- *Apply a protective eye shield*
- *Refer for further medical treatment the same day*
- *If referral not possible: next day give a further dose of oral vitamin A, 200,000 IU, and again two weeks later (same dose)*

e. *Important points to prevent Xerophthalmia*
- *Breast-feed vitamin A rich colostrum (the first breastmilk) to the new born baby*
- *Breast-feed infants for at least one year*
- *Start at 3-6 months to feed infants locally available leafy green vegetables rich in vitamin A, well-cooked finely chopped, and mixed with other food,if possible, to make them more acceptable*
- *Include dark green leafy vegetables or fruits in the feeding of pre-school children every day*
- *Include yellow-orange fruits rich in Vitamin A (i.e. papaya and mango) in the child's diet*
- *Include fat in the child's diet, with dark green leafy vegetables, fruit and other sources of vegetables*
- *Pregnant and lactating women should eat food rich in vitamin A every day*
- *Administer vitamin A 200,000 IU in oil by mouth to mothers after the birth of the child or within one month after birth*
- *Educate families that night blindness is an early warning sign of xerophthalmia and can be treated by feeding vitamin A in oil by mouth*
- *Teach school children to detect and report night blindness in younger children*

- *Learn how to recognize, treat and prevent xerophthalmia.*

7.2 Prevention and Cure of Cataract : Cataract is termed as cloudy lens inside the eye.

a. *Complaint*
   - *Gradual loss of vision over a long period of time*
   - *Lens often changes from being clear to a milky white colour*
   - *Feels as if looking through a dirty window*

Source :Ophthalmology Section, Directorate General of Health Services (1996), National Programme for Control of Blindness, P. 14.

Fig. 2.5 : Cataract eye

b. *Examination and findings*
   - *Gray or white pupils*
   - *Usually both eyes are affected*
   - *Usually found in old people*
   - *Measure the vision*

c. *Action to be taken :* Refer for further examination and possible operation if:
   - *patient can not perform daily activities*
   - *mobility of the patient is restricted*
   - *vision is worse than 6/60 or finger counting at 6 meters in both eyes*

7.2.1 Important Points for Prevention of Cataract: Although there is no medicine to prevent cataracts, an operation can be performed to help restore vision. The following precautions may help prevention of cataract:

- *Take a good and nourishing diet rich in protein and vitamin, such as milk, papaya, mango, carrot, spinach, egg and fish*
- *Protect the eyes from excessive exposure to sun rays, intensive heat, X-rays and injuries*
- *Treat diseases like diabetes and syphilis effectively*
- *Can not be cured by application of any medicine to the eye or by taking any medicine orally*
- *In the beginning eye-sight can be improved with glasses*
- *Obtain suitable glasses after gettingthe eyes tested*
- *Power of glasses changes with the progress of cataract*
- *After maturity of cataract, surgery is needed to restore vision*

7.2.2 Organizing Eye Camps: The Camp approach has become very popular for the prevention of visual impairement and cure of cataract, glaucoma etc. Following steps may be taken for organizing the eye camps:

- Collaborate with an eye hospital or blindness prevention organization
- Identify the persons having eye troubles and who need immediate eye check-up
- Avail financial assistance from any one of the following agencies:

a. National Programme for Prevention and Control of Blindness
Directorate General Of Health Services
Nirman Bhawan, New Delhi 110 011

b. Sight Savers International
A 3, Shivdham, New Link Road
Malad (W), Mumbai 400 064

c. Christoffel Blindenmission
South Asia Regional Office (North)
YMCA Cultural Central Building
1, Jaisingh Road
New Delhi - 110 001

d. Christoffel Blindenmission
South Asia Regional Office (South)
559, 11th Main Road
Hall II Stage, Indiranagar
Bangalore - 560 008

e. DANIDA
A-148, Safdarjung Enclave
New Delhi - 110 029

f. OXFAM (INDIA)
C6/59, Safdarjung Development Area
New Delhi - 110 016

g. Helpage India
TRDC, C-14, Qutab Institutional Area
India Habitat Centre
Zone -V, II Floor, Lodhi Road
New Delhi - 110 016

h. Shri Manav Kalyan Trust
II floor, Swapna Complex
Jawaharnagar Chowk
Maninagar, Ahmedabad 380 008

i. Local Lions, Lioness and Leo Clubs

j. Local Rotary, Rotaract and Inner Wheel Clubs

k. Local Eye Hospitals

l. State Department of Public Health

m. District Blindness Control Societies

- Create public awareness using pamphlets in the local language and other suitable means e.g. beating of drums, puppet shows etc.
- Organize eye check up camps with the involvement of the local eye hospital or the local Ophthalmic Surgeons
- Provide treatment, medicines, eye drops to the patients not requiring eye surgeries
- Organize eye camp in the central village with the involvement of the village Panchayat, youth club or any other local organization
- Arrange the follow up of the cases who have been operated in the camp
- Arrange for the eye check up of all these cases and provide suitable glasses or eye drops etc.

7.2.3 Hospital Based Surgery

7.2.3.1 Limitations of Camp Approach: While the camp approach enables en-masse eye surgeries in the remote areas, it has the following limitations:

- Does not assist in the planned development of permanent intervention strategies.
- Due to temporary structures and poor quality of infrastructure, its difficult to maintain acceptable standards of quality of services.

- Due to large expenditure on creating make-shift facilities, the unit cost of surgeries may be exorbitant, particularly when the number of surgeries performed in one camp are lesser.
- Not within the distance a service provide can reach regularly as and when required
- Not available at the time when the patient requires it the most and can manage it.
- Non-existent, irregular or many-a-times no follow up services.

7.2.3.2 Alternatives to Camp Approach: Due to these limitations, a tremendous shift from the provision of cataract surgeries performed in one-time eye camp to establishment of permanent eye care facilities which operate throughout the year is essential. The following alternatives in this respect are available:

a. Supporting, as an interim measure, eye care activity outside the eye hospitals by establishing eye units in the General Hospitals.
b. Promoting outreach screening or diagnostic camps where patients identified for eye surgeries are transported to a hospital for eye surgeries, treatment and post operative care.
c. Establishing satellite hospitals in the rural areas which perform refraction, eye screening, eye check-up, treatment, simple surgeries, follow up and public awareness etc. All those persons who require further diagnostic or surgery etc. are referred to base eye hospital. The satellite hospital coordinates transporting these patients, post-operative follow up, refraction and other support services for these patients.

d. Promoting establishment of Rural Eye Hospital with optimum capacity of 20 beds or less for performing refraction, eye screening, diagnostic, treatment and eye surgeries etc. These hospitals may refer complicated cases to a cluster level or district level speciality eye hospitals.

Eye care needs to be tackled as strategy which focuses on development of appropriate physical facilities and equipment, development and upgradation of human resources and higher quality of planning.

7.2.3.3 Objectives of the National Programme: The National Programme for the Control of Blindness, Ministry of Health & Family Welfare, Government of India aims at strengthening India's capacity to provide high volume, high quality and low cost eye care by upgrading health and management skills for eye care personnel and to improve the service delivery. It aims at promoting mobile eye care as well as fixed facilities in service delivery.

The National Programme desires to promote a three tiers service delivery model for diagnosis and treatment of patients:

a. Primary care at block and village levels by Medical Officers, Ophthalmic Assistance, Health Assistants and Health Workers;
b. Secondary care including cataract operations at District Hospitals, Sub-district Hospitals/Community Health Centres (where Ophthalmic surgeons posted) and through mobile camps; and
c. Tertiary care in Regional Institutes of Ophthalmology and Medical College Hospitals.

The National Programme desires the medical colleges to emerge as referral centres for tertiary ophthalmic care in the region, to train ophthalmic personnel and to monitor activities under the national programme. It desires the District Hospitals to provide secondary eye care services, trained personnel and medical officers. Similarly, it desires to upgrade sub-district hospitals as well as community health centres as permanent eye camp sites for Government, Non-Government as well as private ophthalmologist engaged on service contract basis.

Thus the main objective of the National Programme would be to improve the quality of cataract surgeries and reduce prevalence of blindness by reducing the cataract backlog through multipronged strategy.

7.2.4 Type of Cataract Surgery : There is no preventive or medical cure known for cataract. It can occur at any age but is most commonly seen as aging process in adults of 45-50 years or more. It gradually leads to progressive diminution of vision in both eyes and ultimately blindness and is associated with eye problems. However, if cataract is removed surgically, complete eye sight can be restored.

7.2.4.1 Simple surgery: Cataract can be cured by a surgical operation in which the opaque lens is removed which allows the light to reach the retina. Spectacles, contact lens or intraocular lens may then be provided to compensate for the power that is lost after the removal of lens.

7.2.4.2 IOL (Intraocular Lens) Implant: These are made of an inert plastic material called polymethylmethacrylate (PMMA). The IOL lens is permanently implanted in the eye at the time of cataract removal. It usually does not require to be renewed anytime in life thereafter.

Advantages of IOL

(a) Person achieves workable vision within one or two weeks as compared to three months in case of simple surgery.
(b) Person may not require glasses for distant vision but for near vision, glasses are required.
(c) Excellent mode of treatment for unilateral cataract, particularly in children who develop cataract due to trauma.
(d) Excellent quality of vision, almost near to normal.
(e) The field of vision is near normal.
(f) Disturbing optical aberrations as seen with glasses are completely eliminated.

Limitations: IOL implant is a specialized surgery to be performed by the trained Ophthalmologists only. It requires increased manipulation during surgery with the possibility of greater complications. It also requires sophisticated instruments e.g. microscope etc. It is more expansive as compared to simple cataract surgery.

7.2.4.3 Phaco technique : a. Beginning - Dr. Charles Kelman of New York performed the first human phacoemulsification operation. Though accepted with great enthusiasm initially, phacoemulsification had to be abandoned by many surgeons because it was difficult to perform. Moreover, the large size of IOLs available at that time required that a very large wound be made to accommodate the lens. Enthusiasm for phacoemulsification resurfaced in early 1990s, with the development of small incision IOLs, improved phacoemulsifiers and highly effective viscoelastics.

b. Procedure : "In the bag" or "in-situ" phacoemulsification in the posterior chamber is the currently practiced and generally accepted technique. In this technique, immediately before proceeding to emulsify the nucleus, visco-elastic is injected

into the anterior chamber. Most of the nucleus is then emulsified in the capsular bag, using the phaco probe. The the epinucleus is removed and the cortex evacuated.

c. Advantages : Phacoemulsification surgery performed through a small incision has several advantages:

- less induced systemic and ocular complications
- much reduced post operative astigmatism
- more rapid and complete visual and systemic rehabilitation

d. Limitations : The limitations of this procedure include:

- its enormous costs
- the long and difficult learning curve
- severity of complications in the absence of high technological back-up

At present, the cost of this technique is exorbitant. Its success would depend upon cost effectiveness of the procedure.

7.3 Prevention and Cure of Trachoma

a. Causes
- *Caused by an organism chlamydia trachomatis.*
- *1/5 of the inhabitants of the world are effected by this disease.*
- *It is the single largest cause of blindness.*
- *Spreads by contact from one person to another through dirty hands, contaminated towel, and the like*
- *Flourishes among people whose surroundings are unhygienic and whoare crowded together in an unhealthy environment where there is:*

*   * lot of dust*
*   * scarcity of water*
*   * poor sanitation*
*   * many flies*
*   * open and dirty latrines*
*   * open drainage and the like.*

Fig. 2.6(a) : Mild Red Watery Eyes

It is contagious in its acute stages, being spread by the transference of conjunctival secretion by fingers or towels, by flies etc.

7.3.1   Primary infection is epithelial and involves both conjunctiva and cornea.

a. Symptoms
- *Redness*
- *Itching*
- *Tearing*
- *Irritations*

b. Signs : Diffused conjunctival inflammation characterized by congestion, formation of follicles on the inner aspect of the upper lid. At a later stage, a trachometous pains or vascularisation of the upper margin of cornea takes place. Corneal ulcers are commonest at the advancing edge of the pumas.

c. *Treatment*
- *Clean the eyes if there is discharge*
- *Sulphacetamide eye drops 10% or 20% to be instilled at least 4 times a day for 6 weeks.*
- *Advise on personal hygiene and daily washing of face.*
- Check other members of the family for trachoma
- Never use medicines containing steroids.

7.3.1. Trichiasis : Apart from the results of pumas and corneal ulceration, the most malign effects of trachoma are caused by distortions of the lids. There is always some scarring and the shape of lids, especially upper lid, is altered and may be turned inwards, leading to entropion. This causes the lids to rub against the cornea. The condition of misdirected eyelashes is called trichiasis.

Photo : John DC Anderson

Source :Ophthalmology Section, Directorate General of Health Services (1996), National Programme for Control of Blindness, P. 14.

Fig. 2.6(b) : Follicles on Eye

a. *Symptoms*
- *Irritation*
- *Photophobia*
- *Tearing*
- *Poor vision*

b. *Signs*
- *Thickening or distortion of upper lid*
- *Eyelashes rubbing on cornea*
- *Cloudy appearance of cornea*

d. *Treatment*
- *Remove misdirected eyelashes*
- *Use of drugs - Tetracycline, Erythromycin, Rifampicin and Sulfonamides are effective when given systematically but have many side-effects.*

Topical treatment with Erythromycin ointment, Tetracycline or Rifampicin is far more effective than Sulfonamides. This treatment must be persistent for 5 consecutive days a month for 12 months. Oral Doxycycline 5mg/kg body weight one per month is easy to administer and is as effective as topical Tetracycline.

Further treatment may be required in the form of surgical correction of lid deformity.

7.4 Prevention and Cure of Glaucoma : Glaucoma, popularly known as Kala Motia or Neela Motia is a serious killer of eyesight. Nearly one in 10 persons in the world is visually impaired due to Glaucoma. As per Dr. N. N. Sood, nearly 100-150 million Indians over the age of 40 years are in the vulnerable age-group and it is likely that nearly three million either have Glaucoma or are potential candidates.

a. *Complaint*

i. *Acute glaucoma strikes suddenly with intense pain, nausea and blurred vision*

ii. *Chronic glaucoma*
   - *often called the 'sneakthiefof sight'*

- *works slowly and progressively and can destroy vision almost without warning*

b. *Signs*
- *An occasional vague headache or aching about the eyes*
- *An occasional blurring or cloudiness of vision*
- *An occasional watering of eyes*
- *Frequent and unsatisfactory changes of glasses*
- *Haloes (rainbow rings around bulbs and headlight of vehicles) appear towards evening or when the individual is disturbed*
- *Diminished side vision*
- *Occasionally difficulty in night vision*
- *May produce a permanent loss of vision within a few hours to weeks and needs emergency treatment.*

c. *Causes*
- *A nearly constant fluid level is maintained inside the eye*
- *Due to disturbance in the drainage system, fluid can no longer drain away as fast as it is produced*
- *Pressure builds up and eyeball tends to get harder*
- *Pressure pushing against the optic nerve destroys these nerve fibres slowly producing a hollow space called 'cupping of the disc' and it destroys sight.*

d. *Detection*
- *Everyone over 35 should visit an eye doctor for an eye check-up*
- *The most common method of checking for glaucoma is with a tonometer*

e. *Treatment*
- *Glaucoma is a treatable condition*
- *Treatment is aimed at lowering the internal pressure in the eye*
- *Special eye drops used regularly would maintain the internal pressure at the proper level*
- *In some instances, surgery may be required*

f. *Points to remember*
(a) *Glaucoma can be halted but not cured and continuing treatment is necessary.*
(b) *It can destroy sight with little or no early warning.*
(c) *Doctor can usually detect glaucoma before any sight is lost.*
(d) *Vision lost because of glaucoma can never be restored*
(e) *Since it is life long problem, periodic visits to specialists are essential*

g. *Beware, if you*
- *are over 35 years of age*
- *have blood relatives who have Glaucoma*
- *have diabetes*
- *asthmatic and patient of arthritis on long term oral "Corticosteroids"*
- *use cortisone medication*
- *have rainbow rings around bulbs, lights or candles*
- *pain or blurring of sight in the evenings*
- *children with large eyes.*

7.5 Prevention and Cure of Diabetic Retinopathy : Diabetic retinopathy has been a leading cause of blindness and is gaining unprecedented proportions in the developing countries. Just three decades ago it was considered 'not preventable' and

'relatively untreatable'. The timely application of laser photocoagulation could reduce visual loss from diabetic macular oedema.

a. *Occurrence :* Diabetic macular oedema occurs in approximately 10 percent of all diabetics. In patients with diabetes for 20 or more years, incidence increases to 25 percent.

b. *Definition :* Macular oedema is defined as any retinal thickening of or deposition of hard exudates within one disc diameter of the centre of the macula. It is termed significant if any of the following three characteristics are present:

● *Thickening of the retina at or within 500 u of the centre of fovea*

● *Deposition of hard exudates associated with the area of adjacent retinal thickening at or within 500 u of the foveal centre*

● *Development of a zone of retinal thickening one disc diameter or larger.*

c. *Detection*
  ● *Through the use of slit beam with a fundus contact lens.*
  ● *Subtle amounts retinal thickening can be distinguished, and presence of hard exudate deposits can be easily identified.*
  ● *Leakage responsible for retinal thickening can be confirmed angiographically.*

d. *Treatment :* The decision to treat diabetic macular oedema is based entirely on clinical and angiographic findings, independent of patient's visual acuity.

● Focal treatment consists of directing only green argon photocoagulation to all leaking microaneurysms.
● Grid photocoagulation treatment of diffuse leakage is based upon the identification of leakage in the mid-and-late frames of the angiogram, unrelated to focal sites of leakage identified in the early frames.

Only 15 percent patients actually improve in measurable acuity. The goal of treatment, rather, is to preserve the patient's current visual performance. A period of 1-6 months is required for maximum reabsorption of fluid and complete healing.

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CHAPTER III

DEMOGRAPHIC DETAILS OF THE VISUALLY IMPAIRED

[Expert comments: Dr. S. R. Shukla, Director, National Institute for the Visually Handicapped, Dehradun]

1. Population of the Visually Impaired in India with Reference to the World Situation

There are several estimates about the size of the disabled population in India with reference to the world situation.

1.1 The United Nations has estimated that there are:

- 500 million disabled in the world
- 400 million disabled in the developing countries
- 42 million visually impaired in the world
- 9 million visually impaired in India
- 80 percent of them live in remote and isolated villages

1.2 The World Health Organization Expert Committee on Disability Prevention reviewed the available information on the prevalence of disability in the world. The committee broadly estimated that about 10 percent of the world population is disabled.

1.3 The UNICEF document 53/54 published in 1981 mentions that the prevalence rate of disability in Latin America is 11.06 percent of the population including 2 percent for visual impairment.

1.4 The Indian Council of Medical Research collaborative study conducted in 1972-73 estimated 9 million blind and 45 million visually impaired population based on the 1971 census figures in India.

1.5 The National Sample Survey of India: The NSSO conducted the 47th round of a nation-wide comprehensive survey of disabled persons during July-December 1991. The survey arrived at an estimate of 16.15 million persons having at least one or the other disability, which constituted 1.9 percent of the total population of 850 million. The survey revealed that population of the visually impaired in India at 850 million level of population is 4 million as per the following distribution:

Table 3.1

Estimated population of the visually impaired (1991) (Thousands)

Sex	Rural (%)	Urban (%)	Total (%)
Male	1539 (38.42)	308 (7.69)	1847 (46.11)
Female	1796 (44.84)	362 (9.03)	2158 (53.88)
Total	**3335 (83.27)**	**670 (16.72)**	**4005 (100.00)**

Source: Survey of Disabled Persons, NSSO, 1991

RURAL MALES
RURAL FEMALES
URBAN FEMALES
URBAN MALES
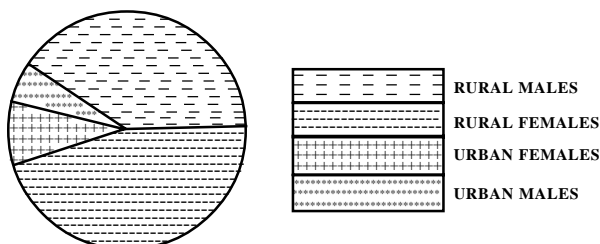
1.6 The National Programme on Control of Blindness conducted a survey, popularly known as WHO - NPCB Survey 1981-86 on various causes of blindness in India. The Survey revealed the following:

Table 3.2

Prevalence of visual impairment (6/60 Acuity Level) (Millions)

Category	Prevalence Rate	Estimated Numbers at 800 Million Population	Curable (88.06%)	Incurable (11.94%)
Both Eyes	1.49	11.92 M	10.49 M	1.43 M
One Eye	0.92	7.84 M	6.57 M	1.27 M
Eyes	1.99	31.84 M	28.02 M	3.82 M

Source: WHO - NPCB Survey, 1981-86

Note: The first category refers to persons with vision loss in both eyes; the second category refers to persons with vision loss in one eye only; whereas the third category refers to number of eyes having loss of vision irrespective of number of persons.

The population of the visually impaired in India according to various estimates is as given below:

Table 3.3

Population of the visually impaired (Millions)

S.N.	Agency\Source	Year	No. of Blind (Millions)	%to Population
a.	Bhore Committee	1944	2.00	0.57%
b.	Health Ministry	1963	4.50	1.00%
c.	ICMR Study	1971-74	9.00	1.40%
d.	NSSO Survey	1981	3.47	0.50%
e.	WHO-NPCB Survey	1986	12.00	1.49%
f.	NSSO Survey	1991	4.00	0.47%

Source: WHO - NPCB Survey, 1981-86
Survey of Disabled Persons, NSSO, 1991

Thus the population of the visually impaired according to various estimates varies from 0.47 percent to 1.49 percent of the total population at the time of respective estimate or survey. So far, the ICMR Study estimate (1971-74) of 9 million population has been widely accepted and quoted. The door to door survey of the Rural Activities Committee of the National Association for the Blind at 108 project locations in rural areas across the country also establishes that the population of the visually impaired as 0.5 percent of the total population. The findings of the Rural Activities Committee corresponds with that of the National Sample Surveys conducted during 1981 as well as 1991.

Thus the National Sample Survey provides the most conservative but probably the most realistic estimate of population of the visually impaired in the country.

Total Population of the Visually Impaired in India = 40,05,000

The population of the visually impaired according to urban & rural distribution is:

Rural	33,35,000
Urban	6,70,000
Total	**40,05,000**

The population of the visually impaired according to sex is :

Males	18,47,000
Females	21,58,000

2. Demographic Pattern: Country Profile of Persons with Disabilities

The National Sample Survey (1991) has established the following demographic profile of persons with disability in India:

a.   *The number of physically disabled persons in India was 16.15 million and they formed about 1.9 percent of the total population.*

b.   *74.3 percent persons with disabilities live in rural areas. The prevalence of physical disability is reported to be 2 percent in rural areas and 1.6 percent in urban areas. Similarly, Incidence Rate is reported to be 90 per 1,00,000 in rural areas which is higher than that of 83 in urban areas.*

c.   *Between the two sexes, prevalence as well as incidence are reported to be marginally higher among males than among females.*

c.   *About 12.4 percent of these persons suffered from more than one type of physical disabilities.*

d.   *The persons with locomotor disability are largest in number (7.6 million); followed by those with speech and/or hearing impairment (4.5 million) and then those with visual impairment (4 million).*

e.   *About 9 and 7 percent households in rural and urban India respectively have at least one disabled person in the household.*

f.   *Among these households, about 92 percent had one disabled person, about 7 percent had 2 disabled persons and less than 1 percent reported 3 or more disabled persons, both in rural and urban sectors.*

g.   *About 25 percent in rural areas and 20 percent in urban areas are reported to be severely disabled as they could not function even with aids and appliances.*

h. *About 70 percent of disabled persons are found to be illiterate in rural areas as against 46 percent in urban areas. Only 4 percent persons with disability in rural India have an educational level "secondary and above" as against 12 percent in urban areas.*

i. *Only 29 percent and 25 percent persons with disability are employed in rural and urban India respectively. Out of these, 60 percent were self employed, 7 percent regular employees and remaining 33 percent as casual labourers.*

3. On-set of Visual Impairment

3.1 Congenital Visual Impairment : The NSSO Survey establishes that:

- *majority of blindness is acquired*
- *only 44 out of 1,000 blind persons (4.4 %) of all age groups acquired blindness during 0-4 years of age.*
- *congenital blindness is almost negligible*

3.2 Acquired Visual Impairment : The NSSO survey attempts to establish the extent of on-set of visual impairment by analyzing the age of on-set in the age-group 60 years and above as well as persons of all ages.

3.2.1 Age Group 60 Years and Above: The on-set of visual impairment can be established by studying the distribution per 1,000 persons of 60 years of age as well persons of all age-groups.

Table 3.4

Per 1,000 distribution of persons of 60 years and above with visual impairment by age at the on-set of impairment

S.N.	Age Group	No. of Visually Impaired (Distribution per 1,000)	
		Rural	**Urban**
1	00-04	08	12
2	05-09	08	15
3	10-14	09	07
4	15-19	02	03
5	20-24	03	06
6	25-29	03	05
7	30-34	04	05
8	35-44	18	18
9	45-59	255	236
10	60 & Above	689	690

Source : Survey of Disabled Persons, NSSO, 1991

Majority of visually impaired persons,that is 69 percent of them, acquired their impairment at the age of 60 years and above. The next important age-group was 45-59 years as 24-26 percent acquired visual impairment in this age group. Both in the rural and urban sectors, the percentages are marginally higher in the first three age-groups viz. 0-4, 5-9 & 10-14 years than that in the next 4 age-groups.

Thus the on-set of visual impairment takes place predominantly after the age of 45 years

3.2.2 All Age Groups: Distribution of On-set of Visual impairment in All Age Groups by Age

Table 3.5

On-set of visual impairment in all age-groups

S.N.	Age Group	No. of Visually Impaired (Distribution per 1,000)
1	00-04	44
2	05-09	31
3	10-14	21
4	15-19	10
5	20-24	12
6	25-29	13
7	30-34	16
8	35-44	64
9	45-59	285
10	60 & Above	494

Source: Survey of Disabled Persons, NSSO, 1991

Only in 4.4 percent of the cases, the on-set of visual impairment is among the age group 0-4 years. In more than 77 percent of the cases, visual impairment occurs at the age of more than 45. In about 50 percent cases, the on-set of visual impairment is after the age of 60 & Above.

4. Prevalence of Visual Impairment

Prevalence means number of persons born with visual impairment or became visually impaired per 1,00,000 population in the country till the date of survey.

Table 3.6

Prevalence rate of visual impairment

S.N.	Age Group	Rural	Urban
1	0-4	34	30
2	5-09	85	47
3	10-14	85	62
4	15-19	89	74
5	20-24	82	72
6	25-29	121	56
7	30-34	143	98
8	35-39	185	112
9	40-44	275	152
10	45-49	391	273
11	50-54	826	514
12	55-59	1236	788
13	60 & Above	5060	3253
	All	**525**	**302**

Source: Survey of Disabled Persons, NSSO, 1991

Prevalence rate:

- *is highest in the age group 60 & above, 5060 and 3253 for rural and urban areas respectively, followed by age group 55-59 with 1236 and 788 for rural and urban areas respectively.*

- *is lowest in the age group 0-4 years, 34 and 30 for rural and urban areas respectively.*

- *rises steadily with the increasing age both in the rural as   well as urban areas. The prominent increase is, however, from   the age of 50 years onwards.*

- *is higher in the rural as compared to urban areas for all the age groups.*

It is also found that in the community based rehabilitation programmes implemented at 104 locations in India, 84 percent of the visually impaired identified in the project areas were of the age of 45 years and above. Thus the majority of visual impairment occurs in the age of 45 and above.

5. Incidence of Visual Impairment

Incidence means the number of persons born with visual impairment or who acquired impairment per 1,00,000 population in the country within a specified period of 365 days preceding the survey.

The Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1996 desires Appropriate Governments and Local Authorities to take certain steps for the prevention of occurance of disability.

Table 3.7

Incidence rate of visual impairment

S.N.	Age Group	Rural	Urban
1	0-4	7	9
2	5-09	3	2
3	10-14	4	2
4	15-19	1	1
5	20-24	2	3
6	25-29	3	2
7	30-34	2	2
8	35-39	4	2
9	40-44	17	5
10	45-49	27	17
11	50-54	36	50
12	55-59	106	71
13	60 & Above	225	221
	All	**25**	**20**

Source: Survey of Disabled Persons, NSSO, 1991

Incidence rate is:

- *lowest in the age group of 5 to 39 as it is reported to be only between 4 and 1 in the rural as well as urban areas respectively.*

- *low in the age group 0-4 as it is reported to be 7 and 9 for the rural and urban areas respectively.*

- *highest in the age group of 60 & above, 225 and 221 for the rural and urban areas respectively, and followed by age group 55-59 with 106 and 71 for the rural and urban areas respectively.*

- *comparatively higher in the age groups 0-4, 22-24 and 50-54 in the urban areas as compared to rural areas. When all the age groups are considered simultaneously, it is higher in rural areas (25) as compared to urban areas (20)*

- *almost consistent with minor fluctuations in the age groups 5-44, rises steadily with the increasing age in the age groups 44 & above both in the rural as well as urban areas. The prominent increase is, however, from the age of 55 onwards.*

While Prevalence Rate is higher in rural areas as compared to urban areas, the Incidence Rate in few cases is higher in the urban areas. When all the age-groups are considered simultaneously, both Prevalence Rate as well as Incidence Rates are higher in the rural areas. While the Prevalence Rate rises steadily with the increasing age, the Incidence Rate is consistent till 44 years of age and rises significantly thereafter.

Table 3.8

Comparative Prevalence and Incidence Rates of visual impairment

Sector	36th round (July -December, 1981)			47th round (July -December ,1991)		
	Male	Female	Persons	Male	Female	Persons
1	2	3	4	5	6	7
Prevalence Rate						
Rural	444	670	553	471	548	525
Urban	294	425	356	263	346	302
Incidence Rate						
Rural	32	45	38	22	28	25
Urban	23	38	30	15	25	20

Source: Survey of Disabled Persons, NSSO, 1981 & 1991

Both Prevalence Rate and Incidence Rate have declined in the urban as well as rural areas over the period 1981 to 1991. The Prevalence Rate has recorded a marginal decline from 553 to 525 and from 356 to 302 in the rural and urban areas respectively. The decline of 15.16 percent in the urban areas is more significant as compared to that of only 5.06 percent for rural areas. The Prevalence Rate among males in the rural area, however, increased from 444 to 471 during the same period.

The Incidence Rate of 25 and 20 for the rural and urban areas respectively during 1991 has recorded a sharp decline as compared to that of 38 and 30 for these areas during 1981. As Incidence Rate has registered a decline of 21 percent and 20 percent for the rural and urban areas respectively, urban areas have not reflected any comparatively better performance.

6. Gender-wise Distribution

6.1 Gender-wise Comparative Prevalence

Table 3.9

Male - female population

Population	Male (%)	Female (%)
Visually Impaired	46.11	53.89*
Total Population	50.50	49.50#

Source: * *Survey of Disabled Persons, NSSO, 1991*
         # *General Population Survey, 1991*

The Females constitute 54 percent of the population of the persons with visual impairment, whereas in the general population, females constitute only 49.5 percent. Similarly, both the Incidence Rate as well as Prevalence Rate of visual impairment are reported to be higher in females as compared to males.

6.2 Gender-wise Prevalence and Incidence

Table 3.10

Gender-wise prevalence & incidence of visual impairment

Location	Incidence	Prevalence
Male	22	471
Female	28	584

Source: *Survey of Disabled Persons, NSSO, 1991*

It is interesting to note that the prevalence of disability is more among males (57 percent) than females (43 percent) when all disabilities are considered together.

6.3 Gender-wise Distribution

Table 3.11

Comparative male - female population of the visually impaired

Population	Male (%)	Female (%)
36th Round (July-Dec,81)	41.53	58.46*
47th Round (July-Dec,91)	46.11	53.89#

Source: * *Survey of Disabled Persons, NSSO, 1981# & 1991*

The 1981 Survey established that the females constituted 58.46 percent population of the visually impaired. The 1991 Survey, however, establishes a marked improvement in this regard. The percentage of females has declined to 53.89 percent during this period. Consequently, the proportion of the male population has increased from 41.53 percent to 46.11 percent during the same period.

7. Extent of Visual Impairment

The NSSO survey establishes that a large percentage of the visually impaired have light perception.

Table 3.14

**Degree of visual impairment
(Distribution per 1,000)**

Degree of Impairment	Rural	Urban
No light perception	342	312
Light perception on using spectacles	174	292
Light perception not using spectacles	480	387
Total (including n.r.)	**1,000**	**1,000**

Source: *Survey of Disabled Persons, NSSO, 1991*

Only one-third of the visually impaired persons have no light perception. Whereas the remaining two-thirds have light perception with or without the use of spectacles. The percentage of persons having light perception on using spectacles is comparatively higher in the urban areas at 29.2 percent as compared to 17.4 percent in the rural areas.

The proportion of persons with no light perception varies from state to state. Interestingly, in each sector, it was lowest in Orissa in rural areas with 22 percent and Assam for urban areas with 18 percent where the prevalence of visual impairment was reported to be highest. Uttar Pradesh recorded highest percentage (45.4 %) of persons having no light perception followed by Bihar (45.2%) in case of rural areas; whereas Gujarat recorded highest percentage (53.3%) followed by Rajasthan (39.5%) for urban areas in this respect.

8. Location of Visually Impaired Population

8.1 Rural - Urban Distribution

Table 3.12

Rural - urban population

Population	Rural (%)	Urban (%)
Visually Impaired	83.27	16.73*
Total Population	**80.00**	**20.00#**

Source: *   *Survey of Disabled Persons, NSSO, 1991*
             #   *General Population Survey, 1991*

The population of the visually impaired of 83.27 percent as compared to that of 80 percent that of the general population in the rural areas establishes that incidence of visual impairment is relatively more in the rural areas. Thus the population of the blind is predominantly rural.

8.2 Prevalence & Incidence of Visual Impairment

Table 3.13

Prevalence & incidence of visual impairment

Location	Incidence	Prevalence
Rural	25	525
Urban	20	302

Source: *Survey of Disabled Persons, NSSO, 1991*

According to the National Sample Survey of Disabled Persons (1991), for the country as a whole, the Incidence Rate of visual impairment is estimated at 25 and 20 persons in rural and urban India respectively. Similarly the Prevalence Rate of visual impairment is estimated at 525 and 302 in rural and urban India respectively. Thus the incidence as well as prevalence of the visually impairment is comparatively higher in the rural areas than in the urban areas.

8.3 State-wise Distribution : The NSSO Survey establishes that the prevalence and incidence of blindness varies from State to State.

8.3.1   State-wise Prevalence: Number of persons born with visual impairment or became visually impaired per one lakh population in the country till the day preceding the date of survey also varies from state to state.

Table 3.15

State-wise prevalence of visual impairment

S.N.	Category	Prevalence Rate		States	(Rural, Urban)
		Rural	**Urban**		
1.	Highest	820	444	Rural: Orissa	
		382	451	Urban: Assam	
2.	High	>500	>300	Andhra Pradesh	(860, 385)
				Himachal Pradesh	(629, 319)
				Tamil Nadu	(625, 377)
				Haryana	(621, 364)
				Punjab	(599, 301)
				Karnataka	(562, 338)
				Uttar Pradesh	(518, 310)
3.	Moderate	300-499	200-299	Maharashtra	(549, 264)
				Madhya Pradesh	(529, 239)
				Rajasthan	(435, 253)
				Kerala	(418, 388)
				West Bengal	(395, 321)
				Gujarat	(373, 266)
				Bihar	(341, 225)
4.	Low	< 300	<200	Chandigarh, DN Haveli, Delhi, Manipur, Meghalaya, Mizoram, Nagaland - as per NSSO (1985) as these States not covered in NSSO (1991)	

Source: Survey of Disabled Persons, NSSO, 1981 & 1991

Among the States, highest Prevalence Rate in the rural sector was reported by Orissa (820) followed by Andhra Pradesh (806) and Himachal Pradesh (629). In the urban sector also, the rate was quite high for Orissa (444). Only Assam (451) reported a high Prevalence Rate. Bihar, on the other hand, reported the lowest Prevalence Rate in both the sectors. The rates were 341 and 225 respectively in the rural and urban sectors.

8.3.2   **State-wise Incidence:** Number of persons born with visual impairment or became visually impaired per one lakh population in the country within a specified period of 365 days preceding the date of survey also varies from state to state.

Table 3.16

State-wise incidence of visual impairment

S.N.	Category	Incidence Rate		States	(Rural, Urban)
		Rural	**Urban**		
1.	Highest	55	19	Rural: Andhra Pradesh	
		53	50	Urban: Tamilnadu	
2.	High	>25	>20	Punjab	(37, 23)
				Karnataka	(37, 16)
				Haryana	(37, 7)
				Kerala	(23, 31)
				Madhya Pradesh	(26, 12)
				Orissa	(25, 41)
				Assam	(55, 19)
3.	Moderate	15-24	10-19	Maharashtra	(23, 19)
				Gujarat	(19, 15)
				Bihar	(15, 16)
				Rajasthan	(15, 9)
				West Bengal	(15, 11)
4.	Low	10-14	5-9	Uttar Pradesh	(14, 15)
5.	Very Low	<10	<5	Himachal Pradesh	(7, 22)

Source: Survey of Disabled Persons, NSSO, 1991

The Incidence Rate at 55 was found highest in the rural areas of Andhra Pradesh. Whereas Tamil Nadu reported highest Incidence Rate of 50 for the urban areas. When both the rural and urban sectors are considered simultaneously, Tamil Nadu reported a Incidence Rate of 47 which is highest for the country.

When the Prevalence Rate and Incidence Rate are considered simultaneously, the States of Andhra Pradesh, Tamil Nadu, Haryana, Punjab, Orissa, Karnataka and Assam turned out to be most vulnerable states as far as extent of visual impairment is concerned. Both these rates are reported in the highest or high categories of visual impairment. Orissa where the Prevalence Rate was highest for the rural areas at 820, the Incidence Rate was lower as compared to 7 other states as listed above. Likewise, Assam which reported the highest Prevalence Rate in urban sector, the Incidence Rate was only 23, only marginally higher than that in urban India (20).

Uttar Pradesh which reported very high Prevalence Rate of 518 and 310 for the rural and urban areas respectively reported a low Incidence Rate of 14 and 15 respectively. Himachal Pradesh which reported a high Prevalence Rate of 629 and 319 for the rural and urban areas respectively, emerged in a very low category of Incidence Rate of 7 and 22 respectively. There seems to be significant improvement in the rural areas of Uttar Pradesh and Himachal Pradesh.

Kerala and Madhya Pradesh which were reported in the Moderate category in respect of prevalence of visual impairment, have reported its high incidence. Kerala reported Incidence Rate of 31 for urban areas only next to Uttar Pradesh and Tamil Nadu. It may be mainly due to increasing urbanization of population in Kerala and paucity of ophthalmic services.

When the Prevalence Rate and Incidence Rate are considered simultaneously, the States of Maharashtra, Rajasthan, West Bengal, Gujarat and Bihar turned out to be less vulnerable

State-wise Prevalence of Visual Impairment

INDIA

Highest	■	: Orissa, Assam
High	▤	: Andhra Pradesh, Himachal Pradesh, Tamil Nadu, Haryana, Punjab, Karnataka, Uttar Pradesh
Moderate	▦	: Maharashtra, Madhya Pradesh, Rajasthan, Kerala, West Bengal, Gujarat Bihar
Low	▦	: Chandigarh, DN Haveli, Delhi, Manipur, Meghalaya, Mizoram, Nagaland,
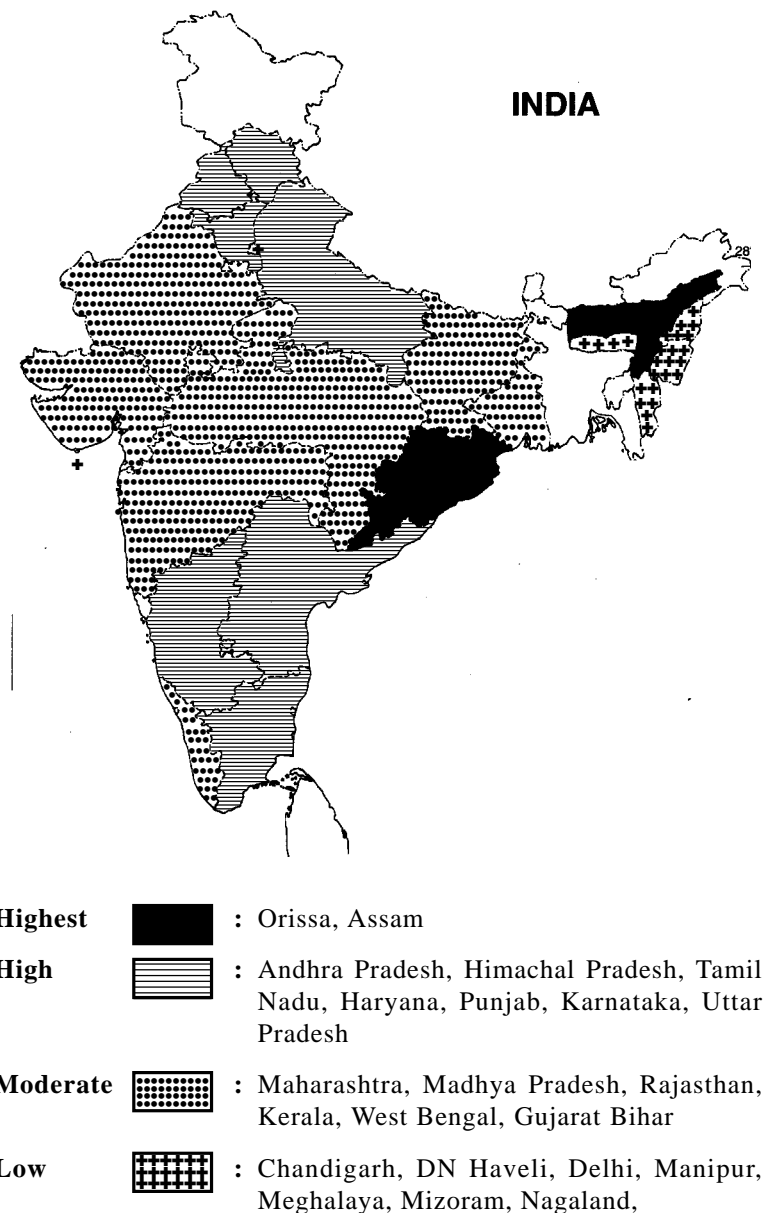
states as far as extend of visual impairment is concerned. Both these rates are reported in the moderate categories of visual impairment.

The areas of Chandigarh, Dadra-Nagar-Haveli, Delhi, Manipur, Meghalaya, Mizoram, Nagaland had reported very low prevalence of visual impairment during 1981 survey. Thus most of the areas India have reported low prevalence of visual impairment. This may be due to lower occurrence of cataract due to cold climate of these areas. The exceptions, however, are Himachal Pradesh and Assam. Himachal Pradesh reported moderate prevalence of visual impairment during 1981 Survey, it, escalated to high category during 1991 Survey. Similarly, Assam which reported the lowest prevalence of visual impairment during 1981, emerged with highest prevalence in its urban areas as per 1991 Survey. It, however, recorded the lowest prevalenceof only 7 for its rural areas during 1991 Survey.

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CHAPTER IV

ORIENTATION AND MOBILITY AND ITS IMPORTANCE

1 Definitions

1.1 Mobility

Mobility is defined as physical "movement" and the negotiation of any obstacles and hazards. It is the aim of obtaining freedom of movement without coming to any harm, safety in travelling as well as minimizing the level of stress placed upon a visually impaired person. While Braille gives intellectual independence, a well-developed sense of mobility facilitates independent movement. It enables the person to detect hazards associated with travelling and to take evasive action.

Mobility refers to total physical movement which involves a change in spatial location accomplished in an upright position under one's own power. It describes all situations ranging from moving around within a single room, in a house to travelling from one town to another or even between countries.

It is the action of travelling, of going from one place to another. To be mobile, a person should be able to gather and use sufficient information from the environment to avoid hazards and to reach his destination safely. Thus it is the ability to move in the environment in relation to oneself from one place to another. In order to do this, a visually impaired person may use a long cane, a guide cane or just a bamboo stick. A locomotor handicapped person may use crutches, elbow crutches, calipers, tricycle, wheelchair, rollators or ground mobility device etc. Both these groups may take the help of a human guide or an escort.

1.2 Orientation

Orientation is the ability to locate oneself in one's environment. It is a skill that is related to the use of the remaining senses of a person to establish one's position in, and in relation to significant objects in the environment.

Orientation involves having an awareness of space and an understanding of the situation of the body within it (Stone, 1995). The process of using the available environmental information to select and follow the correct path is called orientation. It has been established that when vision of a person is completely or partially impaired, he has to depend upon his remaining senses to be able to move around freely. The senses of hearing, touch, smell, kinesthetic and taste can all be used to help him to recognize his position in relation to the obstacles and landmarks around, in the environment.

The training that teaches the visually impaired persons to move around the environment freely and independently is popularly known as "Orientation and Mobility" (O & M).

2. Milestones in the Development of O&M Services in India

1629: Richadsons engravings made by Dutch artist Vanden Enden showing blind people with breast height staffs, now retained in the Library of the Perkins School for the Blind.

17th & 18th Century : John Metaclfe of Kanes Borough, a blind traveller travelled through the North England with the aid of a staff.

1748 : Hanks Levy introduced systematic cane travel

1930 : The Lions Club of Pretoria, Illionois, USA lobbied for White Cane Law.

1931 : The Lions Club of Pretoria adopted a National White Cane programme and distributed 1,000 white canes.

1935 : In Queensland, Australia, the use of the White Cane was stressed as a mark of identification for the blind.

The Senator Schall, a blind person, of the USA died in a car accident when crossing a road. After that a bulletin was issued in the USA for strictly following the White Cane Laws and the White Cane was accepted as a symbol for the blind.

1945 : Dr. Richard E. Hoover, an Ophtalmologist and Incharge of Valley Forge Army General Hospital, Pannysylvania, USA designed a longer and light weight canes and a set of techniques for using the same.

1946: The long cane system was evolved in the U.S.A. in 1946 and introduced by a visiting USA team to Britain in 1966.

1947: Formal and specific training in mobility techniques began in the USA soon after the Second World War. There were many adventitiously blinded soldiers coming forward for rehabilitation. Through their work with these soldiers, a team of professionals devised a programme of training which included the techniques which are in use today - search techniques, the most appropriate way to use a sighted guide, and the use of long cane to facilitate independent travel. Subsequently the Royal National Institute for the Blind formalized the mobility instructor's course. As a result, Mobility Research Unit was established at Nottingham University. Similarly the National Mobility Training Centre was established at Birmingham.

A Mobility Training Manual was published in the USA.

1952 : The Veteran Administration, USA produced a training film "The Long Cane" of 30 minutes duration.

1953 : The blind soldiers from Korean War introduced a new mobility cane.

1957: Lt. Col. Nardekar of the National Association for the Blind, Mumbai (NAB) received training in the use of long cane at the Industrial Home for the Blind, Brooklyn, USA.

1958: National Association for the Blind, Mumbai (NAB) introduced the concept of O & M for the first time in India.

The Lions Club of Bombay initiated the White Cane Movement, distributed white canes and the leaflets.

The NSD Industrial Home for the Blind, Mumbai included mobility services in the course curricula of its Rehabilitation Unit.

1959: Mr. S. H. Kazmi, Senior Teacher of Dehradun underwent training in the use of long cane at Perkins, USA.

1960 : First Graduate Programme in O&M was introduced at Boston, USA for 8 students. Second Graduate Programme in O&M was introduced at Michigaon, USA for 12 students.

Darkell of Britain introduced a cane which was light, thin, strong and longer than the ordinary 36" cane.

1964: The NAB Delegation attended the World Council on O&M in the USA and requested the concerned authorities to start O & M programmes in India. The delegation also collected US$ 10,000 for this purpose.

1965: The NAB appointed an O&M-cum-Physical Training Instructor at NAB Worli Workshop for the Blind.

Blind Welfare, a publication of the NAB, published the first article on O&M written by U.S. expert, Mr. Robert Lessnein.

Dr. E. J. Venn and Dr. D. Devote conducted RNIB survey into comparative virtues of long cane and short cane techniques. St. Dunstan carried out another assessment in this regard. At the end of this assessment, the RNIB considerd that long cane technique enhanced the mobility of all the trainees, improvind their confidence, safety and appearance.

1966: Major D. R. Bridges, Director, American Foundation for the Overseas Blind (now known as Helen Keller International) and Mr. Robert C. Jaekle conducted an international programme on Application of Skill Development Test in Malaysia under the auspices of the American Foundation for the Blind. Late Mr. Jagdish K. Patel and Mr. Oliver from the Blind People's Association (BPA) participated in this programme.

The NAB P & N M Rehabilitation Centre, Mount Abu introduced use of O & M and appointed a full time O&M Instructor.

1967: Major D. R. Bridges visited Mount Abu and interviewed Mr. Y. J. Choksi for imparting him training as O & M Instructor at Kualalumpur.

1968: 3 people from India including late Mr. Manhar Patel from BPA, Ahmedabad and Mr. Y. J. Choksi from the PNM NAB P & N M Centre at Mount Abu participated in the O & M training conducted under the auspices of the American Foundation for the Blind at Kualalumpur.

1969: Two more specialists from Delhi, one from Dr. Rajendra Prasad Ophthalmic Institute, All India Institute of Medical Sciences and the other from the Blind Relief Association received training in O&M.

Delegates from Japan, Philippines, Hong Kong, Malaysia and India attended the First International Workshop for Asia on O&M held at India International Centre, New Delhi. It was sponsored by the American Foundation for the Overseas Blind, Far Eastern Regional Office, Kualalumpur and conducted by AFOB Mobility Consultant, Mr. Robert C. Jaekle.

1970: The Lions Club of Abu introduced the use of long cane and installed public awareness hoardings at public places.

Two more Instructors from India, one each from Calcutta and Ahmedabad received training in O&M at Kualalumpur.

Dr. Richard Hoover of the USA, inventor of long cane techniques visited Mumbai and Delhi.

The National Association of the Instructors of the Blind appointed Mobility Specialists in Mumbai for giving domicilary services.

1971: The Govt. of India invited Mr. Robert C. Jaekle, expert from the Helen Keller International to establish National Programme to train O & M Instructors at the National Centre for the Blind (now known as National Institute for the Visually Handicapped), Dehradun. Subsequently such programmes were started by the National Association for the Blind in Mumbai and Banglore.

1972: Mr. Jaekle addressed the social and professional workers for the visually impaired in a talk arranged by the National Association of the Instructors of the Blind in Mumbai and removed misconceptions about the Long Cane and its use.

The Lions Club of Abu organized a National Workshop on O&M at Mount Abu. The participating O&M Instructors gave live demonstration with the use of tactile maps on the streets of Abu.

1973: National Training Programme for the O&M Instructors was shifted from Dehradun to the Blind Relief Association, Delhi and Mr. Y. J. Choksi appointed as Incharge.

A resolution was passed at the 4th Asian Conference held in Mumbai to include O&M training in the school curriculum.

1974: First O&M Instructors for Karnataka trained from Divine Light School for the Blind, Whitefield. Father Cutinha, Director of the School, arranged a lecture for the members of the Lions Clubs.

Late Mrs. Ratna Atmaram Rao, President of the NAB Karnataka Branch arranged a talk of Mr. Keith Hodswort, Director, National Guide Dog and Mobility Training Centre, Kew Metoure, Australia for the social workers and an interview with the Deccan Herald about O&M.

1975: Mr. Y. J. Choksi presented a paper on *"Importance of Mobility Services in the Schools for the Blind"* at the National Convention of Instructions of the Blind at Ahmedabad. A resolution was passed in this convention to include O&M in the school curriculum and to create posts in all the schools for the visually impaired.

1976: The Christoffel Blindenmission, South Asia Regional Office started a Training Programme for the O&M Instructors at Tiruchirapalli.

1977: The National Association for the Blind organized a national level programme for the training of school teachers, instructors and other workers of the visually impaired in O&M on the occasion of celebrations of its Silver Jubilee. This programme was conducted by Australian team of O&M Specialist and Indian Instructors. Dr. B. K. Panchal from BPA also attended the course. The focus of this programme was to sensitize and motivate teachers of the blind regarding the need for imparting training in O&M to blind students.

1978: The YMCA College of Physical Education, Chennai initiated the Project *"Physical Education for the Blind"* in partnership with the Christoffel Blindenmission.

The NAB, Department of Rehabilitation, Worli, Mumbai appointed two Mobility Officers.

The WCWB Committee on Asian Affairs convened a conference in Hong Kong in which Mr. Don Westaway and Mr. V. Devdas presented papers on O&M. The conference resolved to promote O&M services in Asia.

1979: All India Occupational Therapists Association conducted a workshop in Mumbai on *"Role of O&M in the Rehabilitation*

of the Blind" with the assistance of Australian and Indian experts.

A similar workshop was conducted by the Department of Rehabilitation under the Leadership of Mr. Hans Peter, specialist from Australia for medical and para medical staff at the all India Institute for Physical Medicine and Rehabilitation, Mumbai.

1980: Mr. Don Westaway, Blind Rehabilitation Consultant and Jane Archibald, O&M Specialist conducted workshops and did some research work with blind clients in collaboration with Vijaya Hospital.

The WCWB Committee on Asian Affairs constituted a O&M Sub-group for Asian region with Mr. Y. J. Choksi and Mrs. Leena Chaudhary of the NAB as Members for promoting O&M services.

The first Refresher Course on O&M for practicing instructors, sponsored by UNICEF, was conducted at the National Institute for Visually Handicapped, Dehradun.

1981: The NAB Department of Rehabilitation and the WCWB Asian Affairs Committee on O&M conducted a course for O&M Instructors and blind persons of Nepal. A video film on O&M was prepared by Mr. Y. J. Choksi in Nepal.

1982: The NAB Karnataka Branch established the Mobility Training Centre for blind persons as well as for O&M Instructors with the financial assistance from NAB and with technical support of Mr. Don Westaway.

The YMCA College of Physical Education, Chennai introduced a Diploma Course in O&M.

1983: A post of Mobility Training Instructor was created at the NIVH. The institute included O&M component in the course curriculum of different training programmes. It imparted short term training in O&M to the voluntary as well as professional workers.

1984: The participants of the National Workshop on O&M, sponsored by the NIVH and conducted by the NAB in Mumbai made the following recommendations:

- Nine months Diploma Course for O&M Specialists.
- All India Reference Course in O&M in all parts of India.
- Quarterly Newsletter on O&M.
- Evaluation committee for canes.
- Preparation of documentaries, video films, slides and pamphlets - Mobility Teachers in school and Mobility Officers for adults.
- Six weeks training programme for blind persons.
- National Workshop to Standardize Syllabus for O&M Course.
- Evaluation of canes by the institution.
- Hand Book on O&M.
- All India Association for O&M Specialists.

1985: The NIVH organized a Refresher Course on O&M for Vocational Rehabilitation Centres Officers Trained in O&M, Professors and Lectures from different Universities.

1986: The Rehabilitation Council of India approved the O&M Instructors Training syllabus proposed by the NIVH.

1987: The YMCA College of Physical Education organized a National Workshop on O&M at Chennai. Two pioneers of O&M in India, Mr. Kulundai Raj as the first O&M Instructor and Mr. Y. J. Choksi as the First Indian Master Trainer were honoured in the Workshop.

Dr. Bhushan Punani and Mrs. Nandini Rawal prepared a Manual on *"Guidelines for Social and Economic Rehabilitation of the Rural Blind"* published by the NAB. The Manual listed a variety of services in O&M to be provided to visually impaired persons in rural areas. The Manual was revised and updated during 1997.

1988: First course of six weeks duration, approved by the Rehabilitation Council of India, was started on 16 May at the NIVH, Dehradun.

The YMCA College of Physical Education, Chennai upgraded its Diploma Programme to the Degree of Bachelor of Mobility for the Disabled.

1992: The Blind People's Association and the NIVH organized a Refresher Workshop for the Inservice Mobility Instructors and the Supervisors of the CBR projects at Mount Abu from 20 to 31 July at the NAB-PNM Rehabilitation Centre for the Blind, Mount Abu, Rajasthan.

2-5 August, 1992: 9th Quinquennial Conference of the International Council for Education of the Visually Handicapped included 5 papers on O & M.

1993: Mr. Robert C. Jaekle, truly the Father of O&M, authored a book *"Mobility Skills for Blind People - A guide for use in rural areas"*, published by the Christoffel Blindenmission and the Sight Savers International.

1994: Dr. Bhushan Punani and Mrs. Nandini Rawal published a book "Handbook: Visual Handicap" in which a chapter was devoted to O&M.

1996: Dr. Bhushan Punani and Mrs. Nandini Rawal prepared a Manual on *"Community Based Rehabilitation (Visually Impaired)"* published by the NAB. The Manual listed a variety of services in O&M to be provided to visually impaired persons in the rural areas.

1999: The Rehabilitation Council of India is planning to review the existing O&M Instructors Training Course. It may upgrade it to a duration of one year from its existing duration of six weeks.

3. Importance of Orientation and Mobility

The ability to move in and around the environment is critical and many a times inability to do so affects the individual psychologically, socially, emotionally, economically and physically. (Stone, 1995). One of the main effects or impacts of blindness is in the ability to move around.

3.1 Personal Development

A restricted movement of individuals may influence their development, understanding of concepts and quality of life considerably. It would also restrict their exposure to the environment and the knowledge of the world around them would be limited. Training in O&M would enable them to avail a variety of real experiences and enhance their understanding of the concepts, give them more confidence and all these would result into personal development.

3.2 Independence in Movement

The loss of power to move about freely and safely is arguably the greatest deprivation inflicted by blindness (Koestler, 1976). As being able to travel freely is very important for the sense of independence, O&M training is an important pre-requisite for the integration of visually impaired persons into the community and working life. It enables them to become more independent in indoor as well as outdoor mobility. It allows them more freedom and makes them less dependent on family and friends.

It sharpens remaining senses through sensory training, develops coordination of movement and improves posture. That results into better acceptance of the individual in the community and by the peer group.

3.3 Social Integration

Mobility enables an individual to perform daily activities like going to a grocery shop, temple, common place, venues of social activities, houses of relatives, neighbours and friends etc. Through such movement, individual is able to interact with others and to develop inter-personal relations. It would enhance the quality and quantity of social contacts and integration in community. The extent of social interaction would be enhanced further if the individual is able to use the public transport and go to far off places and other towns.

3.4 Self Confidence

When an individual is not able to travel around freely, it has devastating effect on his/her self concept (Stone, 1995), self confidence and desire to compete and progress. Most people with visual impairment remain confined to their homes, live a solitary life and accept visual impairment as *fate accompli*. Such individuals have to depend upon others even while moving in a familiar environment. They have to depend upon the convenience of others for their movement, daily activities and participating in social activities. While independence in movement would develop self confidence and enable them to perform these activities at their own convenience and pleasure. It would enhance their movement outside home and encourage community participation.

3.5 Safety of the Individual

It enhances the safety of the individual and his fellow beings. It is essential for correcting gait and postural defects. It is not just an overcoming of practical difficulties, but it is also a step towards developing and maintaining one's own self-image. Mobility education will also be one way to get young people fit and the improved fitness will lead to an ability to undertake more intensive training (Stone, 1995)

3.6 Comprehensive Rehabilitation

To be able to move independently within environment is one of the pre-requisites for employment (Hill,1986), gainful occupation, economic rehabilitation or income generation. It is a step toward comprehensive rehabilitation, self confidence and liberation from the solitary home confinement of a person. The success of the vocational training as well as community based rehabilitation programmes also further proves the importance and necessity of independent travel. It also helps in changing public attitudes towards visual impairment.

3.7 Mobility and Sports

There is close inter-action between mobility and sports. Training in O&M is a pre-requisite for promoting sports among the visually impaired. At the same time, participation in sports enhances understanding of the environment, enables a person to overcome fear of movement in the unknown space and improves concentration which in turn results into better mobility.

4. Mobility Techniques

To travel safely in relation to the environment, a visually impaired person can use one of the following techniques or a combination thereof:

4.1 Sighted Guide

4.1.1 While Approaching Narrow Spaces
4.1.2 Ascending and Descending Stairs
4.1.3 Being Helped to a Chair
4.1.4 Passing Through Doorways

4.2 Walking Alone

4.2.1 Trailing
4.2.2 Protective Techniques
    4.2.2.1 Upper Arm and Forearm Techniques
    4.2.2.2 Lower Hand and Forearm Technique
4.2.3 Locating Dropped Articles
4.2.4 Using Landmarks Indoor
4.2.5 Direction Taking

4.1 Sighted Guide

While the principal objective of O&M training is attaining freedom in movement, help of another person is essential under certain circumstances. A visually impaired may require assistance of a sighted guide while crossing a busy road, moving in a less familiar environment, searching a visual sign or moving in a crowded place.

Salient Features

a. It is the skill of travelling with a sighted companion.
b. Training has to be imparted to the visually impaired as well as the sighted person.
c. The sighted person should know how to guide a companion in various circumstances.
d. All the members of the family of the visually impaired should know how to use the sighted-guide techniques correctly.
e. A type of non-verbal communication exists between the visually impaired person and the guide and the latter does not have to tell the former every time regarding the change in direction and other walking situations.

Basic Technique

a. The guide should stand next to the visually impaired person and face in the same direction.
b. To let him know where the guide is standing, the latter should touch the back of the former's hand.

Guide touching the back of visually impaired person's hand

Holding the elbow

c. He should be trained to move his hand up to find the elbow of the guide.

d. He should hold the guide slightly above the elbow with a firm, but relaxed grip in such a position so that his thumb is on the outside of the elbow.

e. He should hold his elbow close to his body and should always be half a step behind the guide with his shoulders directly in line and behind.

f. He can be either on the left or right side of the guide depending on which side he feels more comfortable.

4.1.1 While approaching narrow spaces, the guide should:

● *move his guiding elbow towards the mid line of his back;*

● extend his arm and move side-ways so that the visually impaired person is directly behind the guide.

After the narrow space is over, both should return to the normal sighted-guide technique.

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4.1.2 *When both approach the stairs*, the guide should:

● announce the change is about to occur;
● stop right in front of the stairs so that visually impaired person is one-half step behind;
● climb the steps in the normal way with visually impaired person following a step behind;
● both should shift their weight forward by leaning forward;
● If there is a railing or banister, visually impaired person can be made to follow it.

Similarly *while descending*, the same procedure should be followed. However, both should shift their weight backward by leaning back a bit.

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4.1.3 *To guide a visually impaired person to sit in a chair*, the guide should:

- bring visually impaired person to the chair;
- place his hand of the guiding arm on the back of the chair - and tell him which way the chair is facing;

The visually impaired person should:

- move his freehand to follow the back of the chair down to the seat, if the chair is empty;
- move unaided around to the front while holding the back of the chair;
- turn around so that his legs are touching the front of the chair and then sit down.

4.1.4 *When approaching a doorway*, the guide should:

- tell the visually impaired person which way the door opens;
  (As the correct side for the visually impaired person is the same side as the hinges of the door, he should be on the opposite side of the side on which the door opens)
- open the door with his freehand and transfer the handle to the hand of the guiding arm;
- transfer the handle to visually impaired person who in turn pulls it open to enable the guide to proceed;
- take hold of the handle on the opposite side of the door to enable visually impaired person to pass through;
- pull it to close behind him.

Cautions

a. The sighted person must always remember that visually impaired person is following him.

b. Visually impaired person must never be pushed from the back or just pulled by the arms.

c. Curbs or steps should be approached straight on. If approached from the side, visually impaired person may receive the wrong cues.

d. Whenever there are pits, dug-holes or any other obstructions which necessitate taking a short jump, the guide must announce it and also indicate the rough width or depth.

e. The guide should leave him only at safe places and should inform him while leaving. Preferably, he should be left near an object that he can touch, like a pole, table, wall, chair, cot etc.

f. Visually impaired person should always be behind the guide.

g. He must not walk directly behind the guide with both his hands on the guide's shoulders as it will be more difficult for him to feel the movement when the guide turns left or right or around.

h. While going up or down the stairs, he should be on the railing side.

i. He should tell an inexperienced sighted person what steps to follow as a guide.

j. If an inexperienced guide allows him to bump into objects, he should protect himself by pushing the guide out in front of him.

k. The sighted guide must remember that visually impaired person is not hearing impaired, so he should use his normal tone of speech.

4.2 Walking Alone

Importance: For visually impaired persons, walking alone:

- is very useful in a familiar environment;
- protects them from hitting objects and hurting himself;
- enables them to walk alone, independently and unaided;
- is particularly useful for performing their activities of daily living and personal grooming;
- increases their spatial perception;
- allows them to remain a master of their own will and prevents dependence on others; and
- can be used in conjunction with other techniques;

Basic Technique

4.2.1 Trailing : It is essential to impart training to visually impaired persons as it:

- helps them to walk straightand provides them with tactual information; and
- enables them to detect landmarks or find doorways.

Procedure

Trailing

a. Back of the hand should be used to follow a wall, edge of a table, or other similar objects.
b. Stand next to the object he wants to follow.
c. Extend the arm that is closer to the object and back of his fingers should touch the object.
d. Walk by trailing fingers along the surface towards his destination.

Cautions

a. Only the back of the fingers should touch the object to be trailed because the inside of the fingers are too delicate and may be hurt while trailing a rough object.
b. While trailing, the arm and hand should not drop too close to the body as the person may not find time to stop when there is an obstruction.
c. He should protect his head using his other arm.

4.2.2 Protective Techniques

4.2.2.1 *Upper Arm and Forearm Technique* : This technique generally:

● protects the upper body around the chest and head;
● can be used for protection from low tree branches, open doors, sharp wall curves, corners of walls, cupboards or other such obstacles which may be vertically placed in the path.

Basic Technique

a. The first step in the technique is that a person should raise either the left or right arm to shoulder height.
b. Then the person should bend elbow to form an angle of 120 degrees and fore-arm is held across in front of the face.
c. Hand is turned so that the palm faces away from the person and the fingers are slightly bent back towards the body.

d.   Person moves in this position in the direction desired.

4.2.2.2 Lower Hand and Forearm Technique : This technique:

- protects the lower part of the body near the waist level; and
- can be used to protect against or locate chairs, tables, cots, wash basins, kitchen platform, dressing table or other such low obstructions.

Basic Technique

a.   The first step in this technique is that a person should fully extend either the left or right arm and move the same to the middle of the body.

b.   The persons should bend the fingers slightly with the palm facing the body.

c.   The arm should be held about 10-20 centimeters in front of the body

d.   While bending over, the hand with fingers outstretched, should be held at 20-25 centimeters in front of the face and should precede the face as it moves forward.

4.2.3 Locating Dropped Articles :This technique:

- protects head when bending down to locate a dropped object;
- enables to locate dropped articles in unfamiliar surroundings;
- enables to make a systematic search of articles; and
- saves time.

Circular Movement   *Prepedicular Movement*

Locating Dropped Articls

Basic Technique

a   First stop whatsoever the person is doing.

b   Listen to the dropped object until it stops moving.

c   Face in that direction.

d   Approach close to the area and kneel down using upper-hand and forearm technique or keep head and body straight and place palm down.

e   Begin a systematic search in the following pattern:

  i.   Circular : move hand in ever increasing circles or

  ii.   Perpendicular : follow a square pattern making a series of horizontal movements each separated by one hand's width

f   If object is not found in front, check the left or the right side before moving forward

In the beginning, this procedure can be tried using articles on a table, then on an unobstructed floor area, and then in a room with other articles, furniture etc., and finally in a public place or pavement etc. The visually impaired person should develop a sense of direction as well as distance through sensory training and systematic practice.

4.2.4 Using Landmarks Indoors : This technique:

- enhances indoor safety;
- improves understanding of the relative environment;
- enables independent indoor mobility; and
- is essential for activities of daily living.

Basic Technique

a   The shoulders, back, lower legs, heels, elbow, lower arm and hands should be used to "square off" against furniture articles, wall, door or any like straight object.

b   After squaring off, a straight line should be maintained towards the destination.

c   Straight surfaces and objects whose projections into space act as direction indicators can be used as landmarks.

4.2.5 Squaring Off : It is the technique whereby both the shoulders or other body parts are in alignment to the edge of the road or shoreline. If person does not square off, he may not walk in a straight direction.

4.2.6 Direction Taking : The technique is useful for locating an object which is directly in front of or behind or in line with another object

Basic Technique

a   Stand in front of the object to be used to get the line of direction

b   Touch the object to be used directly with the back part of her legs

c   Should walk straight ahead till he reaches the object to be located.

4.3 Cane Techniques

4.3.1 Pre-cane Devices : These devices originally developed by Dr. Evereft Hill at Vanderbilt University are useful for pre-school children. These resemble the mobility devices used by seeing toddlers when they start walking with the help of a support. These devices are suitable for visually impaired children to use as soon as they start walking with confidence.

Material: These devices may be made from:

- Bamboo
- Wood
- PVC pipe
- Plastic moulded pipe
- Aluminium rod
- Tree twigs
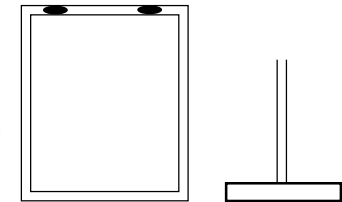
Design

The size of device will depend upon age and height of the child. Beginning may be made with a simple rectangle shape pipe structure with a provision for a hand grip. As the child gains confidence, device may modified to the shape of an "inverted T". Subsequently, castor wheels may also be added to enable the child to roll it on the ground.

Advantages: This device would:

a   Enable the child to gain confidence in movement.
b   Provide safety from the obstructions on the floor.
c   Be a fun to experience independent movement.
d   Lay the foundation for the use of mobility cane when the child grows.

To make it more interesting, small bells or other auditory material may be added. For children with low vision, bright colours may be used. Using soft material at the hand grip would encourage correct hand positioning and proper propelling.

4.3.2 Use of a Long Cane

a.   Traditionally, the white cane:
- is used primarily as an extension of the fore finger to help in locating obstacles along the route and provide with information about the environment;
- is accepted as a symbol of the visually impaired;
- is regarded as the proven mobility aid- is inexpensive, handy and has adjustable length;
- plays a vital role in the education, social integration and comprehensive rehabilitation of the visually impaired.

b.   The white cane techniques are:
- simple
- universal, and
- can be applied even in a relatively unknown environment.

c.   Using the white cane correctly, person can walk safely and independently.

d.   As the cane techniques can be modified in order to suit prevailing conditions, specific requirements or individual needs, thus persons with varying physical capabilities can be trained.

Crossing the road using a white cane

e.   By providing a means of getting to and from work, it enables them to seek a variety of jobs and expedites their economic rehabilitation.

f.   The collapsible white cane can be folded and put in a hand bag while travelling in public transport or while at work.

g.   The white cane system has given a new lease of life and a new dimension of independence to a large number of visually impaired persons.

4.3.3 The Right Type of White Cane

4.3.3.1 The following types of white canes are available:

  i. Symbol Cane
  ii. Mobility Cane
      * Long Cane
      * Folding Cane
      * Electronic Cane
      * Lezer Cane

4.3.3.2 The length of the cane is:

- determined by the height of the user;
- generally 90 centimeters;
- should reach the breastbone when held vertically; and
- should touch the ground about one meter in front when a person holds it.

4.3.3.3 The most popular cane is made of aluminum tubing of about 12 mm outer diameter. It has a grip at the top and a nylon tip at the bottom.

4.3.3.4 In rural India, people generally use a stick or staff for keeping off stray animals. The bamboo stick or conventional and indigenous canes which are ordinary sticks made from a tree branch and not specifically designed for mobility are still in vogue. The length, however, should be adjusted as mentioned earlier.

4.3.4 Qualities of a Good Cane

- good conductivity
- durability
- light weight

- low cost
- strength and resilience
- cosmetic and elegant appearance
- easy availability
- easy reparability
- meeting the specific length requirements

4.3.5 Holding the Cane

a.   Person can hold the cane in either hand.

b.   Grip: While holding the cane
- thumb should be on the front of the top;
- forefinger should be fully extended;
- second finger is curled behind to support the cane;

- other fingers should be kept relaxed;
- elbow should be slightly bent near the body.

c. Hand Position: The hand holding the cane should always be in line with the middle of the body and in front of the navel.

4.3.6 Using the Cane

a. Wrist Movement: The cane is moved from side to side by the flexion and extension of the wrist with the tip touching the ground lightly at each movement. The arm should not be moved.

b. Arc: The cane tip should touch the ground a little wider than the width of the person's body.

c. Instep: Simultaneously with the extension of one foot foward, the cane should move in the reverse. For example, as the left foot steps forward, the cane moves to the right and as the right foot comes forward, the cane goes to the left.

d. Rhythm: The cane tip is lifted just clear of the ground as it traverses between two points of contact. The cane should be moved back and forth at a steady speed as the visually impaired person walks.

4.3.7 Adaptation of the Cane Technique

a. The cane technique can be modified according to:
   ● traffic conditions,
   ● surface,
   ● rural or urban conditions, etc.

b. The following modifications are advisable:

   i   In an urban area, it is advisable to walk in the middle of the pavement to avoid the hazards found at the pavement boundaries.

   ii   In a busy and congested area, it is advisable to reduce effective length by holding the grip lower down to reduce contact with other persons.

   iii In rural areas where the pavements are not properly laid, the effective length as well as sweep may be increased to cover a wider area.

   iv   In muddy conditions, the effective length as well as sweep may be reduced.

4.3.8 Shorelining : The technique of following a fence, wall or side of a pavement with a cane is called shorelining. The person should:

   ●   swing the cane to touch the wall;
   ●   swing it back to the other side; and
   ●   as the person walks, the cane should hit the wall lightly on one side of the arc and ground on the other.

4.3.9   General Cantions

a. If the visually impaired person wants to identify an object that his cane has located, he should use the free hand and not the cane.

b. Avoid swinging the cane only on one side as it is dangerous.

c. In case of any obstruction or ditch located by the cane, the area should be carefully explored and checked before proceeding.

d. The cane should always be held in a correct downward position and one should avoid waving the cane in front.

e. In case of confusion about the direction or location of the person, assistance of any sighted person in the vicinity should be sought.

f. The cane must not be used as a support or for scaring away animals.

g. It is essential to use cane of proper length which depends upon the height of the individual.

4.4   The Guide Dog

Using trained guide dogs for mobility is popular in Europe, South Africa, Australia and America. This technique has not been adopted in the developing countries due to the following reasons:

- Lack of training facilities for training the guide dogs
- Very high cost of maintaining such dogs
- Crowded places and lack of traffic regulations
- Risk from stray dogs and other wild animals
- Religious considerations of not allowing dogs into the kitchen, bed rooms or many a times into the house etc.
- Guide-dog technique, generally, cannot be used to the exclusion of other techniques.

As the guide dog technique is of not of much relevance in India, it has been discussed in brief only.

Basic Technique

a. Usually, the dog is controlled by the left hand and the right hand is used for the long cane technique.

b. The dog is trained to follow commands generally given by raising the harness or operating the lead.

c. The visually impaired person should also understand the cues provided by the dog e.g. stopping at an entrance, deliberately going round an obstacle.

d. Generally the dog precedes the person. However, while leaving the bus, the dog should follow and while climbing down the stairs, the dog should walk along with the person.

e. The person must have complete control of the dog since it cannot be expected to perform certain functions such as identifying the type and the speed of approaching vehicle etc.

f. It must be realized that the Guide Dog is a mere animal and cannot be expected to perform miracles.

5. Using other Senses for Orientation

It is a wrong belief that lack of vision is compensated by the extraordinary development of other senses. In reality, acquired blindness results into shattered confidence. However, through appropriate training and practice, one can develop skills of understanding the environment through the cumulative use of the other senses.

A visually impaired person attains independence in travel if trained in the effective and proper use of the remaining senses. Sensory stimuli termed as 'Clues' generally enable him to determine his position or direction in respect of the environment. Sensory training should generally be provided in the following areas:

5.1 Hearing

Hearing plays a very important part in the orientation process. Auditory clues help to compensate the hardship caused due to lack of visual perception. To gain maximum advantage, the person must use it in a number of ways:

5.1.1 Sound Discrimination: refers to selecting those sounds which are useful for orientation. For example, in a background of a variety of noises in a farm, he may want to separate noise of a bullock cart to get an indication of pavement direction.

5.1.2 Sound Localization: refers to locating the sound in terms of its direction, distance, source quality, variety, angle and whether the sound is moving or not. Once the position of the sound is established, he may decide to move towards or away from it. For example, on locating a sound an of engine of a tractor, he may move away from it for the reasons of safety; or move towards it for approaching the pavement.

The sound discrimination and sound localization help the visually impaired in the following ways:

- Identify objects from their sound
- Relate the sounds to their sources
- Discriminate between simultaneous sounds
- Establish direction and source, whether moving or not, of the sound
- Localize sounds for understanding spatial concepts
- Get an understanding of spaces, places, terrains by sound discrimination.

5.1.3 Mapping of Sound : Whenever sound is perceived in the hearing system, mind of an individual tends to create a map in the mind depending upon direction, distance, agnle,

quality, variety and pitch of the sound. Individual's mind tends to recognize the source and location of the source depending upon these facters and relating the same to past experience as regard nature of sound. A visually impaired person also experiences the seme process. She requires inputs terms of recognition of these sounds and relating the same to the source.

A visually impaired should :

- be encouraged to retrieve maps of sound generator in brain;
- relate quality of sound with the source;
- locats objects using this precess.
- experience and remember variety of sounds;

5.1.3 Echo Location: refers to detecting obstacles through the noises which are generated by an individual and reflected back from the obstacles. It has been established that most congenitally visually impaired people are able to detect obstacles through echo location whereas adventitiously visually impaired people can be trained to do so.

Limitations

- echo location ability deteriorates with age; and
- echo location is difficult:
  * in noisy conditions;
  * when there is strong wind; and
  * when the obstacle is very thin.

It is thus essential that every visually impaired person should be imparted adequate and appropriate training in the proper use of the sense of hearing. It is desirable to use an auditory map for orientation of the environment.

5.2 Touch

A visually impaired person can gain a great deal of information by his sense of touch. Touch is essential for concept clarity and determination of the nature of the object. He can use his tactile sense to explore the environment in the following ways:

5.2.1 Hands can be used to:

● understand spatial quality, surface texture, resilience, temperature, pliability and weight;
● establish the position and then identify objects;
● trail along any object for maintaining contact for mobility;
● avail information about the layout of the environment through tactile maps, models, embossed diagrams and relief maps; and
● understand the diversity of various objects.

5.2.2 Feet can be used to:

● understand the position of various landmarks on the pathways;
● understand the relative position of buildings and the direction and lengths of connecting roads;
● feel changes in surface texture, slope etc.; and
● understand terrain and geographical conditions.

Touch may pose a limitation as large objects and the environment in general are invariably beyond tactile exploration.

5.3 Smell

Smell is useful for orientation, both in the house and the outside, in the following ways:

a. Particular shops, factories or establishments can be identified by odour.
b. Smell from kitchen, store or dining room can be useful as a cue for direction.
c. Through smell, one can establish presence of particular animals in the vicinity.
d. Typical odour from sewers or open drains in the rural areas can be used as landmarks.
e. Sense of smell is useful for understanding one's relative position in an agricultural or a dairy farm or a garden.
f. To relate or associate different items from their smell.

Limitations

a. Sense of smells may change with time and with change in circumstances.
b. Difficult to differentiate smells in crowded places.
c. The same smell may be coming from different directions and locations.
d. Difficult to use this sense in isolation, thus to be used in combination with other senses.

5.4 Temperature

Changes of temperature on the face or body can be used to provide orientation information. For example, it is possible to recognize position of the sun by the part of the face which feels hot. The relative position can be understood by a change from the shade to the sun.

The response of the body to external stimuli, termed as kinesthetic sense enables a person to avail environmental information like heat, cold, rain and breeze etc.

5.5 KinestheticSense

The receptors in the joints, muscles and tendons give information to the brain about the physical position of the individual in the environment. This mode of information is termed as the kinesthetic sense. Through this information, a visually impaired person comes to know the type of ground or surface i.e. grass, road, mud he is walking.

It is possible to remember and repeat particular body movements. Taking meals involves a number of sequential body activities which can be remembered and repeated when required. With practice, particular muscular movements can be produced automatically in a similar situation. It is possible to replicate the extensive body movements involved in walking from one place to another. Getting into a bus, going up the stairs or opening the door generally involves particular muscular movement which can be repeated time and again in a similar manner.

5.6 Taste

It has limited utility for sensory training in orientation and mobility as it does not provide any information about the relative environment. This sense, however, needs to be nurtured for its utility. It helps a visually impaired person to associate names of the particular substances with their particular taste:

- sweet with sugar, candy, sweets
- sour with citrus fruits, juices
- bitter with medicines, herbs, plants
- hot with tea, coffee, milk
- cold with ice-cream, ice, cold water etc.

The sense of taste is particularly useful for identifying the ingredients of food items, drinks, dietary substances and like items.

6. Orientation and Mobility Training in Indian Conditions

6.1 Adaptation of Techniques

More than 83 percent of the visually impaired persons in India reside in the rural areas. Most of these persons are bereft of any rehabilitation services. They face the following problems:

a. Road conditions in the rural areas are unsafe - approach roads to most of the villages and streets in the villages are not well planned and are unmetalled

b. Education as well as training opportunities, particularly for those who acquire visual impairment at later age are grossly inadequate.

c. Appropriat mobility devices are not easily available

d. Whatsoever devices are available, these have not been suitably adapted to suit the local conditions.

While adapting the mobility techniques for the rural blind, the following factors should be kept in mind:

a. Techniques should be easy to perform with the least possible physical strain.

b. Cost of mobility appliances should be within the reach of everyone.

c. Ensure maximum safety in local conditions.

d. Their appearance should be in consonance with the surroundings.

e. Easy to repair and maintain.

f. Easily available.

g. Culturally appropriate.

h. User freindly.

6.2 Individual Need Based Training

The individual felt needs and a environment of a visually impaired person must be considered while evolving the O&M training strategy. The training should be provided with the active involvement of the family members and community. The age and physical capacity are also of utmost importance while planning the nature of O&M training. While it is advisable to evolve and initiate individualized O&M training, the following guidelines which have been listed according to the age group may be useful.

6.2.1 Age Group : 0-16 Years

6.2.1.1 Orientation : Orientation training in respect of the following objects, articles and items should be provided:

a. Household (by hearing, movement and touch)

- location of the house, various rooms in the house
- neighbourhood and houses in the vicinity
- streets leading to the house and common landmarks around
- household articles like utensils, beds, cupboards, racks, furniture and other like articles

b. Clothes (by hearing and touch)

- clothes of either sex and of different age groups and various local fashions
- dressing styles and popular costumes
- folding and stacking away clothes
- identification of clothes

c. Food Ingredients (by touch, smell and taste)

- grains and pulses
- fruits and vegetables
- edible roots, leaves and plants
- fodders, feeds, oil-cakes, husk and straw
- spices, vegetable oil and other cooking items
- sugar, jaggery and salt.

d. Kitchen Material (by touch and smell): Specially for blind girls

- fuel, firewood, soft coal, coal, dung cake, cooking gas
- cooking gas cylinder, cooking stove
- stove, *angithi* (fire place), gas stove
- match box, gas lighter etc.
- method of lighting and putting off fire

e. Home Economics (by touch)

- currency notes, coins
- envelopes, inland letters, postcards
- brooms, mops
- soap, washing powder, scrubber
- hair-oil, cosmetics, make-up articles
- comb, hair pins, purse, belt

f. School Articles (by touch)

- books, note-books
- school bag, water bag
- pen, pencil, eraser, sharpener
- toys, kites, marbles
- strings, crackers

- Braille slate, inter-point Braille frame, stylus
- Braille paper
- abacus, geometry box, foot ruler
- sketching device
- felt pens
- large print

g. Economy (by touch, explanation)

- car, bus, truck, auto-rickshaw, scooter, train
- bullock cart, camel cart, cycles, rickshaw
- agriculture operations, rural trades, occupations and crafts prevalent in the area
- milch animals like buffaloes, cows, goat, sheep
- festivals, fairs and other celebrations
- common animals and birds
- plants, trees and shrubs

h. Landmarks (by touch, hearing)

- post office, bank, school
- temple, *panchayat* or municipality office
- river, pond, water supply point
- bus stop, rickshaw stand, railway station
- market place, business centre

i. Concept Clarity (by touch, hearing)

- different shapes, sizes and measures
- volume, numerical and weights
- sounds, colours and textures
- surfaces
- auditory maps for understanding the relative environment
- tactile maps

6.2.1.2 Mobility Training : Mobility training in respect of the following aspects should be provided:

a. Sighted Guide Technique of

- ascending and descending stairs
- passing through doorways, narrow passages
- being helped to a chair, cot or plateform
- getting into a car, bullock cart, bus, train, auto-rickshaw

b. Protective Technique of

- trailing
- upper hand and forearm
- lower hand and forearm
- locating lost objects
- direction taking
- using landmarks indoor

c. Sensory Training in

- sound location
- sound localization
- discrimination
- alignment
- echo
- shadow perception
- sensory facial perception

d. Cane Technique

- pre cane techniques
- holding the long cane
- using the long cane: grip, hand position, wrist movement, arc, keeping in step, rhythm.

- adaptations of the cane techniques
- crossing the road and the using public transport
- shoreline movement, drag and glide, touch and drag
- understanding parts of cane and benefits of using cane

e. General Mobility

- crossing of roads
- encountering of animals, bullock carts, cycles, auto-rickshaw and other automobiles
- climbing and descending from various vehicles
- training in running, jumping, climbing, crawling, throwing, catching
- moving across the fields using walk-ways

f. General Familiarity with

- neighbourhood
- local administration office
- bus stop, rickshaw stand, railway station
- school, play grounds, children's park
- temple and other public places
- ponds, rivers, wells, water supply works
- dispersary, hospital, healthcare centre
- milk collection centres

g. General Knowledge about

- art of seeking help from sighted guide and strangers
- safety rules and traffic rules
- system of traffic lights and zebra crossings

- different mobility aids and use thereof
- location of disability development centres.
- location of social development offices

6.2.2 Working Age Group 17 - 60 Years : The visually impaired persons of the working age group are in the prime of their life. They are expected to maintain their family or, at least, contribute towards the family income. They need to be economically rehabilitated. Hence, the O&M training must aim at enhancing their economic activity and their integration in the society.

The O&M training which is provided to persons in the age group 0-16 years, as listed earlier, must also be provided to the persons in this age group with the exception of orientation of school articles.

The additional aspects of O&M training for this age group are listed below:

6.2.2.1 Orientation

a. Additional Landmarks: (by touch and hearing)

- co-operative society, training centre, employment exchange,
- youth clubs, tailoring shop, betel shop, grocery shop
- farm machinery service centre, seed and fertilizer agency
- farm produce marketing yard, shopping centres

b. Economy (by touch and hearing)

- own farm, roads leading to farm
- place of work and convenient route
- farm implements, stationary machinery and

equipment

- special employment aids, measuring devices and adaptations.
- breeds of cattle, buffalo, sheep, goat, camel.
- popular trades, crafts and domicilliary occupations prevalent in the area and their economic viability
- schemes of subsidy, soft loan and financial assistance
- concessions and facilities available to them and the procedure thereof
- understanding of the local administration, election process and role of the local administration
- general developments and progress in the area and the country as a whole.

6.2.2.2 Mobility

- travel independently to the farm, place of work
- travel independently to the co-operative society, farm produce marketing yard, shopping areas or other marketing areas
- use of advanced mobility aids viz. electronic cane, tactile maps, auditory maps etc.
- crossing of roads where there is no street light
- travel to the bank and operate account independently
- travel independently in the public transport

6.2.3 Age Group 60 Years and Above : The persons in this age group are generally referred to as Senior Citizens. As they generally suffer from physical degeneration, geriatric

disorders and diseases and have physical limitations, most of them can not undertake laborious work. Thus it is not desirable to plan for their economic rehabilitation. However, it it expedient to encourage their social integration. It will necessitate active involvement of the family members in the rehabilitation process. But for such involvement, the aged persons may express their unwillingness to avail such training.

The orientation as well as mobility training as listed for age groups 0 - 16 and 17 - 60 years may also be provided to this age group on selective basis and as per individual needs with the exception of school articles and kitchen articles. However, the aged persons may be provided following additional training:

6.2.3.1 Orientation

- items used for prayer like incense sticks, lamp.
- location of place of worship
- nearby places of pilgrimage and religious discourses
- village square or a place where the aged people meet regularly
- nearby dispensary, health centre or the family physician
- location of the pension or social development office
- location of an entertainment centre

6.2.3.2 Mobility

- travel to the place of worship independently or with a sighted guide
- travel to place of pilgrimage using the public transport or any other conventional mode of transport
- mobility to the meeting place and other public places
- in-door mobility for personal care and activities

of daily living

7. Training of O&M Personnel

7.1 Degree of Bachelor of Mobility

The YMCA College of Physical Education, Chennai initiated the Project *"Physical Education for the Blind"* in partnership with CBM during 1978. It developed a programme of physical education for visually impaired which included:

- a varietyof physical activities,
- adapted games,
- an appropriate class management, and
- a physical fitness test to evaluate their physical fitness

Seeing the success of the Physical Education Programme, the first Diploma Course in Orientation and Mobility was conducted in 1982. It was subsequently upgraded as Degree of Bachelor of Mobility for the Disabled.

7.1.1 Group Method of Teaching: The college introduced the group method of teaching O & M, where one O&M teacher can concentrate on three to five students at a time, thus doing away with the standard 1:1 system of teaching O&M. It has the following advantages (Jaimitra, 1995, P. 198):

a. The teacher can concentrate on the weaker student while the others are practicing a skill within the field of vision of the teacher.

b. There will be cooperation and encouragement among the group.

c. Lead up activities and recreational activities can be introduced to relieve the tedious practice.

d. Positive competition will be present among the group and so the weak student will try to come up to the level of the others.

Lesson plans are the basic foundations in any teaching programme and the project has introduced the module lesson plan.

The project has been constructive in designing and introducing the Bachelor of Mobility Science Degree course recognized by the Madras University.

7.1.2 The Mobility Course consists the following curriculum:

Part I: Theory

First Semester

Paper-1: Introduction to Movement Education and Mobility Science and Psychology, Counselling and Guidance.

Paper-2: Organization and Administration of Mobility Science, Methods and Materials for Teaching and Evaluation of Mobility Science.

Paper-3: Techniques and Aids for Mobility Science and Braille

Second Semester

Paper-4: Physical Education, Applied Physical Fitness and Recreation.

Paper-5: Introduction to Physiology, Opthalmology and Audiology

Paper-6: Health Education and Nutrition and Safety Education, First Aid and Physiotherapy.

Part II: Practice Teaching (First and Second Semesters)

It consists of observation classes and school visits to handle classes in the school situation. Each candidate should maintain a work book which shall contain records of atleast 20 lessons supervised by qualified O & M and physical education personnel. Of these, atleast 15 lessons shall be from O&M and 5 lessons

from physical activities.

The practice teaching at schools shall be conducted for a period of 5 weeks in a year of which 3 shall be continuous.

Part III: Practical Works (First & Second Semesters):

Participation in learning skills under blind-fold teaching methods and techniques of the following activities:

- Pre-cane Skills
- Cane Skills: indoor, outdoor, unknown building
- Travel Skills: road crossing, unknown residential area, shopping centre, transportation skills, city travel and rural travel.
- Conditioning Exercise: (general and specific exercises) - Major games: cricket, volley ball, soft ball, *kabaddi* and table tennis
- Minor Games, Track and Field events, Swimming.
- Gymnastics and Tumbling
- Indigenous Activities: *asnas*, *dhands*, *bhaitaks*, *malkhamb* and *lazium*
- Marching and Clisthencies
- Light Apparatus: clubs, dumb bells, pole and hoops
- Physical fitness
- Recreational Activities: (creative recreation, productive recreation) daily living, sensory training, teaching aids.

7.2 Training of CBR Workers

The National Association for the Blind, Rural Activities Committee has evolved a course curricula of 6 weeks duration for imparting training to CBR Field Workers. The curricula includes 12 hours of theory and 90 hours of practical in O & M.

a. Definitions
- Orientation
- Mobility

b. Importance of O & M
- Safety of the individual
- Financial independence
- Step to comprehensive rehabilitation
- Mobility and sports

c. Techniques, methods and process of O & M
- Sighted guide techniques
- While approaching narrow ways
  * Ascending and descending stairs
  * Being helped to a chair
  * Passing through doorways
- Walking along
  * Trailing
  * Protective techniques
- Upper arm and forearm techniques
- Lower hand and forearm techniques
  * Locating dropped articles
  * Using landmarks indoor
  * Direction taking

- Pre-cane Skills
- Long cane

  * Importance

  * Right type of cane

  * Qualities of cane'

  * Techniques of holding the cane

  * Grip

  * Hand position

  * Wrist movement

  * Arc

  * Rhythm

  * Using the cane

  * Adaptation of cane techniques for rural areas

  * Shore-lining

  * Guide dogs

- Introduction of basic techniques
- Limitation in Indian conditions
- Specific mobility techniques for rural areas

b. Using other senses for orientation

- Hearing
- Touch
- Smell
- Temperature
- Kinesthetic Sense
- Taste

c. Orientation and mobility training in Indian conditions

- Adaptation of techniques
- Individual need-based training

d. Sound localization

- Significance of distance
- Quality of sound
- Direction of sound
- Mapping of sound

7.3 Orientation & Mobility Training Course

The Rehabilitation Council of India has evolved this course for training the O&M instructors. This course is being run at the National Institute for the Visually Handicapped, Dehradun and the Blind Relief Association, New Delhi.

Paper I : Foundations of O & M.

- Foundations
- Basic Techniques
- Sensory training
- Sense of hearing
- Sense of Touch
- Olfactory Sense
- Kinesthetic Sense

Paper II: Anatomy and Physiology of the Eye and Ear

- Opthalmology
- Audiology
- Audiogram

Paper III: Learning Process

- Learning

- Mental Process
- Motivation
- Learning and Teaching

Paper IV: Rehabilitation of the Visually Impaired

- Rehabilitation and its components
- Rehabilitation Services
- Responsibilities of a Mobility Instructor

Practical I: O & M Techniques

- Sighted guide techniques
- Other useful techniques
- Room familiarization
- Recognition and use of landmarks
- Long cane techniques
- Application of cane techniques in different conditions

Practical II: Braille

- Mastery over English and regional Braille codes
- Orientation to Braille numerals

Practical III: Sensory Training and Daily Living Skills

10 activities should be suggested for developing the abilities of the senses in a visually impaired child. (Sense of touch, hearing, smell, taste and kinesthesis).

The trainee should undergo blindfold experience in practicing daily living skills such as washing, bathing, dressing, shopping, drawing house hold activities and personal grooming etc.

Practical IV: Teaching Practice

- Internal (During the basic course)
- External (100 hours teaching practice in the school)

Practical V: Field visits

Practical VI: Project work for case study

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The Persons with Disabilities Act, 1995 makes the following provisions as regard orientation & mobility of the visually impaired persons :

Section 45: The appropriate Governments and local authorities shall, within the limits of their economic capacity and development, provide for :

(a) installation of auditory signals at red lights in the public roads for the benefit of persons with visual handicap;
(b) causing curb cuts and slopes to be made in pavements for the easy access of wheel chair user;
(c) engraving on the surface of the zebra crossing for the blind or for persons with low vision;
(d) engraving on the edges of railway platforms for the blind or for persons with low vision'
(e) devising appropriate symbols of disability;
(f) warning signals at appropriate place.

Chapter V

Activities of Daily Living and Home Economics

1. Introduction

Activities of Daily Living (ADL) comprise everything entailed in human life and relationships. These are the basic activities necessary during an ordinary day. There are hundreds of activities which a person performs from the moment he wakes up in the morning till he goes to sleep at night.

Sighted persons normally learn to perform these activities by themselves by observing other persons. A large part of daily living activities are learnt by observation and imitation. As visual discrimination is involved in these activities, a visually impaired person cannot learn the same on his own. Through his other senses, he may get an idea of what is going on but he cannot learn the exact procedure.

It has been observed that loss of confidence associated with the loss of vision retards the daily living skills of such a person. At the same time, lack of opportunity and environment are also the major causes of restricted performance of such activities. Thus the major objectives of imparting training in daily living skills should be to:

- enable him to carry out his day to day activities with the least possible external assistance and with safety;
- help him to be self-sufficient in all functional activities;
- instill confidence to enable him to be socially integrated;

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- develop healthy personal and family relationships;
- learn scientific management of self and home;
- become aware of safety precautions to be taken in the home;
- become a well groomed person;
- reduce dependence upon the care-takers;
- expedite comprehensive rehabilitation including economic independence; and
- develop a positive self image.

Thus activities of daily living include all those activities which people do everyday. Training a visually impaired person in these activities would enable him to become self-reliant, independent and more confident in his routine activities. Although these activities are not an end in itself, these certainly are a very essential means toward complete, meaningful and comprehensive rehabilitation.

2. Training Strategy

Due to lack of visual perception as well as discrimination, it is difficult for a visually impaired person to learn daily living skills on his own. As most skills are of a routine nature, he does not need to learn any special techniques for performing these skills. However, it is essential to train him for the particular procedures involved in performing the activity. In swimming, for example, he has to follow the same steps as a sighted person but may need to be given special training in safety matters.

Many times, special techniques or special equipment or adaptations may help him to perform certain activities more proficiently. These techniques or adaptations make use of other senses of touch, hearing, taste etc. for his convenience. By using a Talking Clock, for example, he may know the time, day and date as conveniently as a sighted person.

2.1 Procedure for Designing the Daily Living Skills

a. Observe daily living skills of sighted persons of different age groups.

b. Identify the difficulties faced by a visually impaired person in performing such activities and learning the skills.

c. Develop specific procedures for each skill with suitable modifications.

d. Consider the following aspects concerning visually impaired persons while evolving the training schedule:

- individual felt needs
- physical potentials
- age
- age at the on-set of visual impairment
- familybackground, economic status and occupation
- environment, and
- past experience

e. Explain the procedure followed by sighted persons in performing a particular activity to visually impaired persons.

f. Impart relevant training in orientation and mobility associated with the effective performing of a particular activity.

g. Supplement the skills with appropriate assistive devices and adaptations.

h. Incorporate an in-built system of monitoring and evaluation of the training programme.

i. Adopt a system of follow-up for sustaining the abilities to perform the activities.

2.2 Specific Rules for Teaching Daily Living Skills

a. Gather the relevant and needed following items before initiating the training:

- All materials
- Equipment
- Special assistive devices and adaptations
- Embossed diagrams and tactile adaptations

b. Perform task analysis for

- evolving the proper sequence;
- deciding the procedure of performing the activity; and
- finalizing the lay-out and positioning of the material and equipment.

c. Orient the person regarding

- location of the materials;
- procedure of taking and replacing the same;
- hand co-ordination;
- sequence of various operations;
- safety measures;
- use of equipment and adaptations; and
- safety measures.

d. Ensure

- appropriate use;
- safety of the individual;
- no damage to equipment; and
- least possible wastage.

e. Supervise during the performance of the procedure and provide instructions whenever essential.

f. Follow-up, evaluate and appreciate good performance.

2.3 Example: Preparing a Cup of Tea

Step 1. Collecting the Material and Equipment

a. Material

- milk
- sugar
- water
- tea leaves

b. Equipment

- stove/cooking gas
- kettle/utensil, cup, strainer, table spoon

c. Adaptations (optional) for:

- measuring volume
  * listed in the chapter on Assistive Devices
  * can be easily developed locally
  * kitchen utensils can be used
- indicating boiling liquid
  * can be developed on the lines of pressure milk boiling pot
  * by sound
- sugar measure
  * commonly used spoon in the house

Preparing a Cup of Tea

Measuring devices are available abroad but are very expensive and not advisable for developing countries. It is best to teach how to use utensils and other Items which are used by the general population. Thus adapting techniques to suit visually impaired person would be necessary.

Most adapted material like measuring and pouring devices (to name a few) are generally expensive and not easily available, the majority of visually impaired persons would have to learn to utilize the existing and available equipment after careful sensory training.

Step 2. Task Analysis for Evolving the Procedure

On task analysis, the activity of preparing a cup of tea can be divided into following tasks:

Pouring Water

1. Lift and scrub kettle/utensil
2. Fetch water
3. Measure water
4. Pour water into kettle/utensil

Making Fire

5. Locate stove/gas stove
6. Lift match box/gas lighter with one hand
7. Hold match box/gas lighter in one hand
8. Pour kerosene by pressure in case of stove or switch on gas stove
9. Strike match or press lighter
10. Make fire by holding match or lighter near the stove/gas stove

Lighting a Match Stick

Boiling

11. Lift kettle/utensil
12. Position the kettle/utensil on stove/gas stove
13. Cover the kettle/utensil with the lid

Adding Tea Leaves

14. Lift the container containing tea leaves
15. Open the lid
16. Fill a spoon with tea leaves
17. Remove the lid when water is boiling and add tea leaves
18. Replace the container back to its original position

Adding Sugar

19. Lift sugar measure
19a. If it is not available, lift the sugar container
  b. Fill a spoon with sugar
20. Add sugar by tilting the measure (or from the spoon)
21. Replace the sugar measure (or sugar container) to its original place

Adding Milk

22. Take milk pot
23. Measure the desired quantity using a measure or a cup
24. Pour milk into the utensil/kettle
25. Cover the utensil/kettle
26. Replace the milk pot to its original position

Pouring Tea

27. Wait for the tea to boil
28. Switch off the stove/gas stove to put off fire
29. Wait for two minutes
30. Bring tea-pot near the stove
31. Remove lid of the tea-pot
32. Lift strainer and place it on the tea-pot
33. Remove lid of the kettle/utensil
34. Lift the kettle/utensil off the stove/gas stove using cloth or clamp
35. Pour tea into the tea-pot through the strainer
36. Cover tea-pot with lid
37. Place the kettle/utensil, strainer and clamp in the sink for washing
38. TEA is READY for serving.
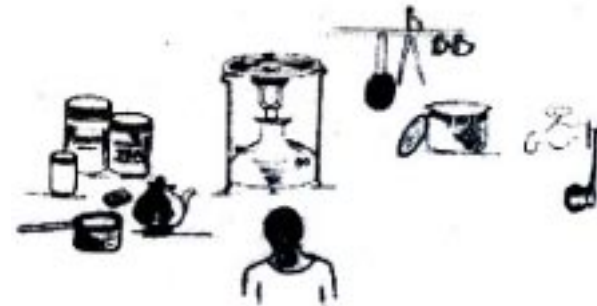
Location of Materials and Equipment for Preparing Tea

Serving Tea

39. Hold handle of the tea-pot in the right hand
40. Touch the cup with left hand and keep first finger on outer side of the top of the cup
41. Lift tea-pot with right hand and bring the pouring point over the cup.
42. Start pouring till first finger of the left hand feels hot.
43. Leave the tea-pot back with right hand, lift cup with right hand itself and drink tea.

Step 3. Time Study for Deciding Location of Various Materials and Equipment

Consider the following pre-requisites of efficient production performance while evolving the most appropriate location pattern:

a. All materials and equipment should be within arm's length

b. Left hand should move clockwise and right hand anti-clockwise while lifting materials and equipment etc. and in the reverse direction while keeping it back

c. Positioning should be according to sequence of the tasks to be performed. The kettle/utensil, for example, as required first should be at the left extreme; and water as required next should be on the right extreme

d. Safety of the person should be ensured while performing the activity

e. Overlapping and cris-crossing of materials and equipment should be avoided.

Based on time study, task analysis and other principles of production and operations management, the location pattern as given in the figure may be evolved.

Step 4.   Orientation

● explain location of materials and equipment to a visually impaired person
● enable him to touch all these things
● explain him the relative positioning of these things in the context of the entire room and his own self.

Step 5. Explaining the Procedure

● explain all 43 tasks involved in the process
● explain the sequence of the tasks
● explain the need for following the sequence correctly, safety measures and likely eventualities.
● explain the procedure for measuring water, sugar and tea-leaves
● explain the procedure of pouring hot liquid

Step 6. Performing the Activity

● supervise while a person is performing the tasks
● instruct him as and when required
● advise him to repeat the task whenever correct sequence is not understood or being followed
● follow-up the process.

Hand Movement: The hand coordination based upon the above noted task analysis, positioning of equipment and materials and sequence of tasks in case of preparing a cup of tea is as listed below:

Task No.	Hand	Activity
1.	Left	Lift the kettle/utensil
2.	Both	Measure and pour water
3.	Left	Lift match box/gas lighter
4.	Both	Light the stove/gas stove
5.	Left	Lift the lid and cover kettle/utensil
6.	Right	Lift tea-leaves container
7.	Both	Add tea leaves to kettle/utensil
8.	Right	Lift stirring spoon
9.	Left	Lift sugar measure/container
10.	Right	Add sugar to kettle/utensil
11.	Right	Measure and pour milk
12.	Left	Lift tea-pot
13.	Right	Lift strainer
14.	Both	Position tea-pot with strainer on top

Task No.	Hand	Activity
15.	Right	Lift kettle/utensil
16.	Both	Pour tea into the tea-pot
17.	Right	Place kettle/utensil, strainer in the wash basin
18.	Left	Lift tea-pot
19.	Right	Pour tea
20.	Right	Returning tea-pot to its position
21.	Right	Lift cup and DRINK tea.

Step 7. Follow-up and evaluation in terms of

- correct sequence
- convenience in handling equipment and materials
- pouring of tea leaves, sugar, milk or tea etc.
- correct measurement of materials
- speed of handling the tasks
- confidence while performing tasks
- any unnecessary delays, confusion, criss-crossing,
- over lapping of tasks and collision of equipment
- uniformity in operations and sequence when the same activity is repeated

By following this procedure, activities of daily living, self care skills and systems of home economics can be modified suitably to enable a person to perform the same independently.

3. Training Content

To enable a visually impaired person to be independent in the activities of daily living and home economics, training should be imparted in the aspects described below. The activities may be adapted to suit the needs of visually impaired persons of rural and urban areas. The principles are the same but minor modifications may be necessary.

Training in ironing of clothes

3.1 Personal Care

a. Hygiene

- bathing
- care of hands and feet
- cleaning of ears
- nail cutting
- oral hygiene: manage toothpaste, brush teeth
- personal hygiene

b. Grooming

- combing and care of hair
- dressing and undressing
- shaving, using facial cream
- skin care, applying cosmetics
- female grooming and hygiene
- using hair oil, cosmetics

c. Social Graces

- social manners, etiquette , courtesy
- table manners, eating habits with fingers, spoon etc.
- style and mode of dressing
- postures while sitting, standing and talking
- gestures
- gait
- socializing, art of conversation

d. Toilet Activities

3.2 Cooking Skills

a. Orientation of

- kitchen equipment, utensils, knives
- weights and measures and modifications in techniques
- special adaptations
- grains, pulses, vegetables, flour, spices and provisions
- different parts of stove, fuel, fire place
- gas lighter, match box

b. Preparatory Operations

- cutting, slicing, peeling, pouring
- grinding, mixing, kneading, grating
- washing, cleaning, soaking, scrubbing
- seiving, filtering, straining

- rolling bread and roasting (*chapati* making)
- boiling, frying, baking
- making fire, lighting stove or cooking gas
- operation and care of stove/gas stove
- setting curd, preparing butter milk
- steaming and pressure cooking

c. Serving Food

- taking out food in serving bowls
- setting dining table or arranging on floor
- putting food on dining table/floor
- following clock-wise method of putting food in plates
- serving water
- removing bowls, plates and cleaning table

3.3 House Keeping Skills

a. Cleaning

- sweeping, dusting
- washing, scrubbing, mopping floor

b. Care of Furniture

- dusting
- washing of upholstery
- wiping of table tops
- keeping furniture at fixed locations
- hanging curtains

c. Laundry

Ironing clothes

- sorting, washing, drying
- folding, ironing, proper stacking
- mending, stitching, buttoning, darning

d. Washing Utensils

- sequence in scrubbing and washing
- use of cleaning powder and scrubber
- disposing off waste
- drying utensils
- replacing utensils at pre-determined locations
- special care of crockery

e. Bed-making

- location of cots
- adjusting of mattresses
- spreading of bed spreads
- positioning of pillows, blankets and bed-sheets

3.4 Home Economics

a. Money Management

- currency identification, coin counting
- safe keeping of money
- budgeting for the month
- simple account keeping
- savings and investment
- maintaining and operating a bank or post office account
- depositing or withdrawing money
- signing of cheques
- knowledge about interest

b. Time and Energy Management

- time and routine activity planning
- leisure time planning

- work simplification techniques
- process of cooking, heating water and lighting for energy conservation

c. Furnishing the Home

- selection and arrangement of furniture, furnishings and decoration articles
- proper lighting and ventilation
- proper placing of calendars, pictures, idols and other decorative articles
- positioning of wall clock and alarm clock

d. Shopping Techniques

- quality of products
- types of shops and their location
- system, period and frequency of buying
- benefits of bulk buying
- awareness of mal-practices in faulty weights and measures; deceptive packaging and adulteration
- consumer rights and responsibilities
- method of using shopping bags
- sequence in stacking of items in the bag

e. Using Appliances

- electric switches, plugs, fan regulators
- telephone
- call bell

- oven, refrigerator, toaster, mixer, geyser, pressure cooker
- cassette player, radio, television
- shaver

f. Care of the Home

- sweeping and mopping floors
- repair & maintenance of doors, windows, furniture & fixtures
- proper placing of furniture, TV, other appliances etc.
- keeping doors and windows properly closed or opened to avoid protruding shutters
- white-wash, painting of walls etc.
- polishing, painting of doors, windows, furniture & fixtures
- proper arrangement and parking of vehicles
- keeping movement areas free of obstructions.

4. Training in Individual Activities

4.1 Bathing techniques are the same for both sighted and the visually impaired. However, training in following aspects should be provided:

- orientationof the bathroom or bathing place, hanging clothes and towel, place for keeping soap, bucket, tumbler etc.
- method of fetching water and its source
- safety precautions
- steps to be followed.

4.2 Brushing Teeth techniques are the same for both sighted and the visually impaired. The main difficulty may be applying tooth paste on the tooth brush. The following steps may be followed for this purpose:

- Hold brush in the left hand with bristles upward between the thumb and the forefingers.
- Open the lid of the tooth paste with the thumb and the first finger while holding the same in the right hand
- Hold tooth paste tube in right hand and place the opening at end of the bristle
- Squeeze the tube so that tooth paste comes out and move it along the bristles taking care that the tooth paste does not fall on clothes or the ground.
- Replace the cap while holding the tube in right hand and replace the tooth paste to its original position.
- Shift the brush to the right hand and rinse the bristles with water
- Brush the teeth by moving the bristles up and down over the teeth and gums
- Wash the brush while holding the same in right hand and replace it to its original position
- Use left hand for taking water to the mouth for gargling and repeat it twice.

4.3 Shaving technique is the same for both sighted and the visually impaired. However, the latter should be slow, more careful and observe the following precautions:

- Double-edged safety razor is more safe
- Downward movement of razor is advisable and the same pattern to be followed every time
- Check with the hand if all areas of the face have been shaved properly
- Electric shaver is safe and convenient but very expensive

4.4 Washing Clothes

- Gather material: soap, detergent, tub, brush, dirty clothes etc.
- Organize the material
  * place tub in the centre
  * dirty clothes on the left hand side
  * soap, detergent on the right hand side
  * source of water supply should be above the tub or nearby

- Apply soap on clothes, rub gently and soak in the tub
- Remove soap by rinsing clothes in water
- Squeeze and wring the clothes to remove water
- Clothes should be dried by spreading on a clean place or by hanging on a clothes-line

Folding clothes

4.5 Identifying Clothes

- By the material they are made of
- By design, tailoring style, pattern etc.
- By special markings in braille or otherwise which can be identified by touch
- By stacking at a particular place in a particular pattern

4.6 Money Identification

4.6.1 Coins

Coin Paise	Identification
5	square
10	round with deep scallops on sides
20	hexagonal
25	round, very thin, one centimeter diameter
50	perfect circle with plain circular boundary
One Rupee	perfect circle, bigger and thicker than the 50 paise coin, circular boundary has a all central round groove

New One same size as 50 paise coin but with a central Rupee all round groove on boundary

4.6.2 Currency Notes: It is generally difficult for a visually impaired person to identify the currency notes. In India, currency notes of one, two, five, ten, twenty, fifty and hundred are common. The rupee one and two notes are almost of the same size. Other currency notes are bigger. These notes can be identified by using the following methods:

Identification of currency notes

a. Notex: is a device developed by the NAB-Louis Braille Memorial Research Centre. It holds the currency notes in two flaps and the same is identified by the notches on the upper flap.

b. Folding Around the Wrist: This method is advocated by the officials of the National Association for the Blind, Rural Activities Committee. The visually impaired person can be trained to identify a currency note by folding it around his wrist and then determining the denomination by the extra length after the first fold. The width of the note is also considered.

c. Spreading Along the Palm: In this method the currency note is spread on the palm of the left hand from the wrist downward. The denomination of the note is determined by the point on the fingers at which the other end touches. The width of the note is also considered.

d. Thickness of the Note: may also enable a person to identify the currency notes. The crispness is also considered. In case of old currency notes, this method may be misleading.

4.6.3 Special Dot on Rs. 500 Note: The Rs. 500 currency note introduced during 1999 carries a round embosse dot at the periphery on the lower side of smaller arm. A visually impaired person can identify Rs. 500 note by locating this dot through finger movement on the outer side.

A visually impaired person has to develop his own individualized sense of recognition based on the above. No blanket approach is viable or advisable.

4.7 Pouring Liquids

Pouring liquids requires good eye-hand coordination. A visually impaired person needs proper training to overcome the limitation imposed by blindness.

a. Cold Liquids

- Hold the tumbler near the tip of the jug containing cold liquid
- Place index finger inside the tumbler
- Pour liquid slowly till it touches the finger

b. Hot Liquids

- Hold the cup near the tip of the tea-pot containing tea
- Place index finger on the rim of the cup
- Pour liquid slowly till it is sensed that the cupis full:
    * by feeling the steam on the index finger
    * by realizing that the outside of the cup is hot
    * by feeling the difference in the weight of the cup
    * by hearing the change in sound associated with filling of the cup to the brim

The volume measuring device explained in the chapter on Aids and Appliances may also be used for measuring the volume in case of hot liquids.

4.8 Making Open Fire

Making fire

In rural areas, the most common mode of making fire is an *Angithi, Chullah* or open space covered by bricks and mud.

- Clean the open space
- Pour kerosene on cow-dung cake or a dry wood
- Stack small wood pieces over and around the cow-dung cake with air gaps
- Light a kerosene lamp - the lamp generally has a metal or glass bottle for storing kerosene and lid into which a wick is embedded. One end of the wick protrudes outside and the other is soaked in the kerosene.
- Make fire by taking burning wick of the kerosene lamp near the stacked wood and cow-dung cake which has been sprinkled with kerosene
- Remove wood pieces or other like objects from near the fire place
- Keep on adding wood or cow dung cake as required
- After cooking, put off fire using water
- Check by moving hand close to ash that no live coal or burning wood is left.
- As far as possible, no inflammable material should be kept near the fire place

4.9 Lighting a Stove
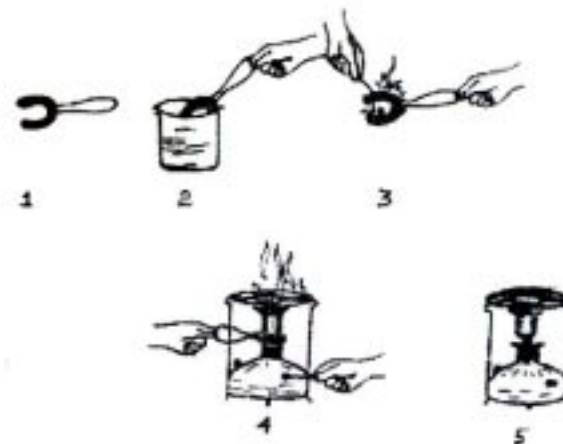
Lighting a Stove

- Pour kerosene using a funnel and a standard bottle for measurement.
- Difference in sound or weight would in dicate when the stove is almost full.
- Wipe away any spilled oil to make the stove safer.
- Clean the burner nozzle using the stove pin.
- Pour kerosene in the cup below the burner.
- Use a safety match for lighting.
- Use stove lighting ring, which is easily available in the market, for lighting the stove.
- Operate the pump two minutes after lighting the ring to vaporize the kerosene and activate the burner.
- Sound of the burner indicates intensity of fire.
- Release pressure to reduce intensity of the fire or to putit off.

4.10 Lighting Gas Stove

For safety, the gas regulator which is mounted on the cooking gas cylinder should always be switched off. The knob of the regulator should be turned anti-clockwise till it touches the lower circle of the regulator.

The following procedure is recommended while lighting the cooking gas stove:

- Check that the knob of the regulator is in off position
- Check that the rubber tube is well connected at both the ends, i.e. regulator as well as gas stove ends.
- Check that the knob of the gas stove is in off position.
- First of all, twist the knob of the regulator clockwise till there is click sound.
- Hold the gas lighter in right hand, keep its front part on the gas burner and keep the thumb on the lighter knob
- With the help of left hand, move the knob of the gas stove clock-wise, only one step to slow position, to start the flow of the gas.
- Simultaneously, ignite the lighter by pushing its knob by the use of thumb of the right hand.
- Move the left hand little above the gas burner to ascertain where the gas starts burning.
- There is *"Bhuup"* sound when the gas is lighted.

Precautions:

- Always keep the lighter on the right side of the gas stove, preferably stuck to the wall at a arm's distance.

- Keep the regulator in switched off condition when gas stove is not in use.
- If there is a foul smell which indicates gas leakage, move the knob of the gas stove anti-clockwise and close the regulator also.
- Do not make fire till the smell persists.
- While lighting the stove, the knob of the gas stove as well as lighter should be operated simultaneously to prevent flow of unburnt gas.

Switching off the Gas Stove : The following procedure is recommended for this purpose:

- Move knob of the gas stove with the right hand anti-clockwise till the lower end.
- Take left hand on the burner to ensure that fire has completely disappeared.
- Move the knob of the regulator anti-clockwise till there is click sound and upper ring of the regulator moves downward.

The leading cooking gas marketing companies viz. Indian Oil, Hindustan Petroleum, Gujarat Gas, Reliance Gas issue instructions in the newspapers as regards various precautions to be taken. It is advisable to understand and follow these instructions strictly. The Braille Presses may produce these warnings in Braille and distribute the same among visually impaired persons. Similary, the cassette book libraries should record such precautionary measures on the audio cassettes and distribute the same among visually impaired persons.

4.11 Eating
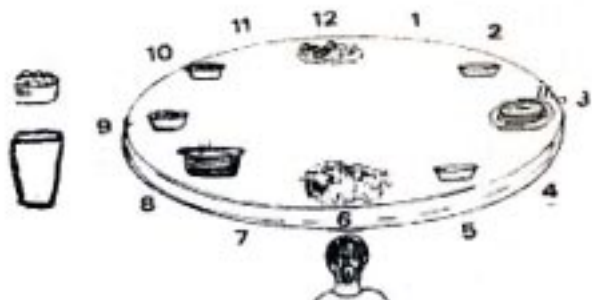
- Avoid serving food by keeping the meals plate on the ground, if possible
- If dining table is not available, use a stool or a raised wooden platform *(chowki)*
- It is easier for the visually impaired person to locate food if it is always placed at the same spot and served in familiar utensils
- It is more convenient and desirable to prepare the plate with vegetables, rice, *chapati* etc.
- Serve food according to the dial of a clock as indicated below:

The following hours of the clock positioning of various items of standard Indian meals is recommended. It may be suitably modified according to the menu and the individual needs:

- Water glass should be on the left hand side outside the plate.
- Vegetable bowl should be on the left side outside the plate.
- It is easy for a person to feel what food he is eating and how much, if he eats food with his fingers.

Clock Position	Item
1-2 O'clock	Sweet/dessert
3 "	*Chapati* (bread)
4 "	Curd
5 "	Gravy
6 " & Centre	Rice
7-8 "	Pulses
9-10 "	Vegetables
11 "	Pickles
12 "	Salad

- The proper way to hold and use a spoon and a fork is the same for both the sighted and the visually impaired. *Generally the fork is held in the left hand and spoon in the right.*
- The system of coordination of fingers is the same for both the sighted and the visually impaired.
- It is essential to maintain a proper posture while eating.
- The local manners and customs which are to be observed while eating must be taught to the visually impaired.

4.12 First Aid

a. *Definition*: It is the first help given to an injured person or to those taken suddenly ill before taking them to a health centre or hospital.

b. *Objectives* :

- to save life
- to prevent injuries becoming worse
- to help recovery

c. *Importance*: Many a times, while performing activities of daily living, travelling, moving around or in the course of employment, a visually impaired person may injure himself. Particularly when moving in an unknown environment, he may bump into some obstructions, walls, household articles, parked vehicles etc. At such time, immediate medical care may not be available. If he is trained in First Aid, he will be able to take immediate measures and prevent injuries from becoming worse.

d. *First Aid Kit*: should contain the following:

- Bandage
- Cotton swab
- Scissors
- Antiseptic material like dettol, safeguard etc.
- Band-aid
- Burnol
- Simple medicine like Analgine, Metacin etc.

e. *Illustration*: First Aid in case of bleeding

- Apply steady and very firm pressure directly over the bleeding
- Make the injured person lie down
- Lift up the injured organ
- When the bleeding slows, apply a pressure bandage over a pad

f. *Training*: During training in Activities of Daily Living, 2-3 lectures on First Aid should also be included. A local physician, or qualified health worker or the officials of the Red Cross may be invited for this purpose. The field staff in turn should train the visually impaired person in First Aid. He should be encouraged to keep a First Aid Kit in the house or at the place of work.

5. Nature of Training in Activities of Daily Living in Indian Conditions

Irrespective of the age of the person or the different customs or the different economic strata a person may come from, there are certain common basic daily activities for everyone. It is possible to do classification according to age groups for providing training in the activities of daily living.

It is, however, essential to consider the following aspects while planning training in activities of daily living:

- Specific felt needs
- Family back-ground
- Past experience
- Physical potentials, and
- Educational background of the individuals.

It has been observed that it is essential:

- to provide training in natural settings as simulating conditions may not be result oriented;
- to support such training with relevant training in orientation and mobility and sensory perceptions;
- the training should be considered an integral part of all subjects taught to the visually impaired; and

- in case of a visually impaired child, it is essential to train the parents in basic skills so that they may in turn teach these skills to the child when he is at home.

The training needs can be classified according to age groups.

5.1 Age Group 0-16 Years

a. Personal Hygiene

- bathing
- toilet training
- oral hygiene: dental care, brushing teeth, keeping brush at proper place
- nail cutting
- cleaning ears

b. Grooming

- care of hair
- shaving
- putting on clothes, buttoning them properly
- wearing footwear

c. Social Graces

- holding of meals plate, eating without spilling food
- positioning of glass, drinking cold and hot liquids
- use of spoon, if applicable
- table manners, proper posture and gait

d. Cooking Activities

- lighting of stove, making fire
- general cooking skills, cooking vegetables, pulses
- preparing tea, coffee and boiling milk
- rolling and roasting *chapati*
- using frying pan, kettle, utensils
- boiling of rice

e. Preparatory Kitchen Activities

- washing and cutting of vegetables
- kneading dough
- setting curd and preparing butter milk
- preparing salad

f. House-Keeping Skills

- scrubbing and cleaning utensils
- drying and stacking utensils
- cleaning, dusting and mopping floor
- washing clothes in the house, at the pond and the canal
- adjusting house-hold things
- making and folding bed and bed linen
- positioning and removing cots

g. Home Economics

- currency identification
- counting of coins and currency notes
- safe keeping of money, maintaining accounts
- understanding barter system
- preservation of grains etc.

h. School Activities

- understanding and proper upkeep of the school uniform
- maintaining proper posture in the school
- playing common games: stick walking, carom, chess, playing cards
- keeping pocket money carefully
- proper handling of school bag, books and stationery
- memorizing poems, songs and lessons

5.2 Working Age Group 17-60 Years

The visually impaired persons of this age group are in the prime of their life. They are expected to be the earning members of the family. They must be economically rehabilitated. Hence, the training in activities of daily living must focus at enhancing their earning capacity and their integration into the mainstream of society.

The training in activities of daily living which is provided to visually impaired persons in the age group 0-16, as listed earlier, should be provided to the persons in this age group also with the exception of training in school activities.

The additional components of training for this age group are listed below

i. Social Graces

- social manner, etiquette and graces
- posture while at work and while talking
- polishing and maintaining of shoes

- sense of dressing according to the occasion
- skills of developing inter-personal relations

j. House Keeping Skills

- washing floor, covering it with cow-dung and mud
- pounding and grinding grains and spices
- cooking handling, proper keeping and preservation of food articles, pickles, spices and like materials
- fetching water from the well and storing the same in pots
- making open fire
- boiling pulses in earthen pots
- washing utensils at the pond
- taking care of the children and the elderly
- threading needle, elementary darning and mending of clothes; stitching of mattresses, quilts, pillows

Threading needle

k. Shopping Techniques

- purchasing vegetables and provisions from a nearby market or the weekly rural market
- verifying quality of vegetablesand fruits
- safe keeping of money at proper place in the house

l. Economic Activities

- going to farm independently
- learning to perform economic activity in terms of local crafts, trades or agriculture operations
- buying of raw materials and selling of finished products
- performing of social obligations
- taking care of domestic animals
- feeding, grooming, milking and grazing of milch animals

5.3 Age Group: 60 Years and Above

Due to physical constraints, most of the persons in this age group can not undertake laborious work. Thus the economic and production activities have a very limited scope. It is, however, desirable to plan for their social integration. It is essential to actively involve the family members in the training process as their assistance would be of utmost importance later on.

The training components as listed for age groups 0-16 and 17-60 years may also be provided to this age group also with the exception of school activities, house keeping and kitchen activities. The persons of age group 60 years and above should be provided additional training as regard:

- method of offering prayer, performing worship at the local temple;
- meeting other aged persons at public places and exchanging views;
- special aspects of toilet training;
- taking medicines whenever required;
- taking care of children and ailing family members;
- assisting in the family occupation;
- becoming active member of the senior citizen club;
- assisting other family members in house keeping, home economics and other daily activities; and
- training children in personal hygiene, social graces, school activities and home economics.

6. Special Tips For The Rehabilitation Functionaries

a. It is necessary to explain the causes of visual impairment to visually impaired person and community to eliminate prevailing superstitions. If the visual impairment is incurable, the person must be informed accordingly. He must be convinced to accept his visual impairment.

b. Win his confidence, motivate him to take personal and keen interest in the training programme.

c. Plan training in orientation and mobility and activities of daily living according to :

- felt needs of the individual;
- his interests and aspirations;
- his physical potentials and educational background;

- past experience, age at on-set of visual handicapand existing level of performing these activities; and
- in consonance with his family background, occupation and economic status.

d.   Have patience and help the visually impaired person to:

- touch the materials and equipment;
- understand procedures and implications of each task; and
- permit him to touch the body of the field staff to understand motion of performing the activity.

e.   Demonstrate to him a particular activity, wearing a blind fold, to convince him regarding:

- usefulness of activity;
- ease of performance; and
- possibility of performing activity in the absence of sight.

f.   Counsel the family in the following respects:

- He is normal otherwise
- Lend him assistance in performing these activities
- Active participation in the training process.
- He is not a burden and through proper training he may become independent and contribute towards family earning
- His social integration and economic rehabilitation is essential

g.   Encourage fellow students to

- accept the visually impaired child;
- help him in studies and daily routine;
- not patronize or overprotect him;
- encourage him to perform daily activities independently; and
- participate in school functions and social get-togethers.

h.   Convince the school teacher to

- pay personal attention to such a student;
- make him sit in the front row;
- speak out whatsoever is being written on the black board;
- encourage his acceptance among fellow students;
- involve him in all class-room, sport and other co-curricular activities;
- make adjustments, be patient, and not get irritated;
- give him plenty of opportunity to repeat what he has learnt; and
- encourage him to modify these techniques or activities to suit his requirement.

i.   Consistent follow-up and evaluation is essential for enabling him to internalize the activity in his daily routine.

j.   **Most Important**: The list of activities of daily living provided earlier must not be considered an exhaustive one. It merely provides guidelines to enable the field functionaries to think of many more such activities depending upon the individuals, their needs and the environment.

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1. **Horton, Kirk J** (1986): Ibid

2. **Lawton, Edith B** (1956): *Activities of Daily Living: Testing, Training and Equipment,* New York: The Institute of Physical Medicine and Rehabilitation, P. 58

3. **Lowenfeld, Berthold** (1956): *Our Blind Children,* Illinois: Charles C. Thomas Publisher, P. 201

4. **Mctamney, Moya** (1986): *Learning First Aid*, Geneva: Red Cross and Crescent Societies, P. 118

5. **Mukhopadhaya, Sudesh and Others** (1987): Ibid

6. *Syllabus for Training Blind in Home Management,* Dehradun: National Institute for the Visually Handicapped (Unpublished), P. 9

7. **Tonkovic, Dr. Franjo:** *Learning to be Independent*, Our Blind Child, Paris: Secretariat of the European Regional Committee of the WCWB, P. 42

The Persons with Disabilities Act, 1995 makes the following provisions as regared special support to visually impaired persons :

Section 31: All educational institutions shall provide or cause to be provided amanuensis to blind students and students with low vision.

Section 43(c): The appropriate Government and local authorities shall by notification frome schemes in fevour of persons with disabilities, for the preferential allotment of land at concessional rates for establishment of special schools.

BRAILLE
(Expert Comments: Mr. Harshad U. Joshi)

"The significance of Braille's contribution is critical: without a system of effective communication through reading and writing, the education of blind children would undoubtedly have remained as it had been through the Middle Ages" - Lowenfeld, 1975

1. Introduction

1.1 Inventor : The name 'Braille' of the embossed script for the blind has been derived from the inventor of this six dot system - Mr. Louis Braille of Couprey near Paris in France:

Louis Braille   :   Born : 4 January, 1809
                        Death: 6 January, 1852

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Louis Braille devised the embossed six dot system based on a twelve dot secret code-system prepared by a Frenchman Charles Barbier for the use of the French Intelligence.

1.2 System : Braille is a tactile approach to reading and writing. The basic Braille symbol is called the Braille cell. It consists of six dots arranged in the formation of a rectangle, three dots high and two dots wide or arranged in two columns and three rows. Each dot has a assigned number between one and six.

Braille is a system of embossed "signs" which are formed by using combinations of six dots arranged and numbered thus:

1 O   O 4

2 O   O 5

3 O   O 6

These cells can be arranged in 63 combinations each representing a different character as illustrated in the Standard English Braille Chart.

ENGLISH BRAILLE

	A	B	C	D	E	F	G	H	I	J
1st Line										

	K	L	M	N	O	P	Q	R	S	T
2nd Line										

	U	V	X	Y	Z	and	for	of	the	with
3rd Line										

	ch	gh	sh	th	wh	ed	er	ou	ow	w
4th Line										

	,	; be	: con	. dis		! en	( ) ff	" gg	?	'' in	J
5th Line ea	bb	cc	dd							

	st	ing	Numeral Sign ble	Poetry sign ar	Apostrophe	hyphen com
6th Line						

	Accent sign	Italic sign	Letter sign	Capital sign
7th Line				

Used in forming Contractions :

	Square Brackets		Inner	quotes
Compound Signs	*	Dash	[ ]	' '

The beauty of Braille is that it is based on phonetics. Thus be it any language, Hindi, Japanese, German or Chinese, the same sounding letters will have the same Braillle sign. For example, "ba" in Hindi has the same dot as "b" in English.

1.3 Capital Letters : There are no different symbols for capital letters in Braille. Capitalization is accomplished by placing a dot 6 in the cell just before the letter that is capitalized.

Illustration: For example, dot 6 in one cell before dot 1 in the next cell would make the combination "A".

A   **C**
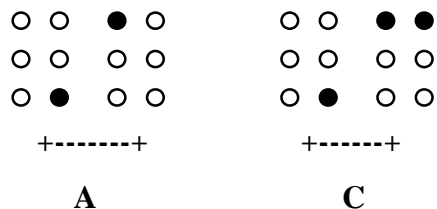
1.4 Numbers: The first ten letters of the alphabet are used to make numbers. These are expressed by the letters 'a' to 'j' preceded by the numeric indicator which is dots 3-4-5-6.

Illustration: The numeric indicator, dots 3-4-5-6 in one cell, before dots 1 in the next cell, which is letter 'a' would make the combination as numeral '1'. Similarly the letter 'b' preceded by numeric indicator would represent numeral '2'. In the same sequence the letter 'j' preceded by numeric indicator would represent numeral '0'

2   **0**
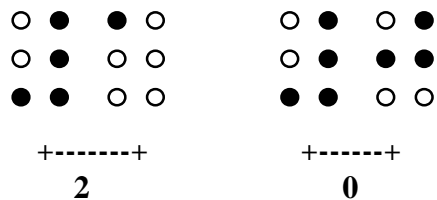
1.5 GradeLevels : The Braille system is classified into three grade levels:

1.5.1 Grade I: Each letter of the Braille word is fully spelled out. It is generally sufficient to learn Grade I for those who do not read and write Braille extensively.

Illustration: The word "STAND" can be represented by dots 2-3-4 in one cell, dots 2-3-4-5 in the second cell, dot 1 in the third cell, dots 1-3-4-5 in the fourth cell and dots 1-4-5 in the fifth cell:

S   **T**   **A**   **N**   **D**
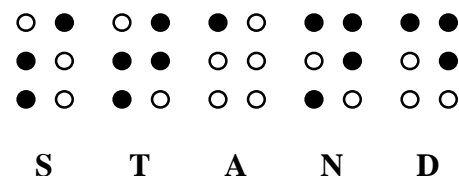
1.5.2 Grade I and 1/2: It represents normal (open) Braille with group symbols which are moderately contracted.

Illustration: The group symbol for 'THE' is dots 2-3-4-6. Thus if dots 2-3-4-6 in one cell are followed by dots 1-3-4 in the second cell, the combination is read as 'THEM'.

T   **H**   **E**   **M**
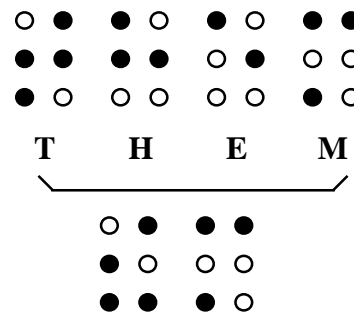
Similarly, the group symbols for the following common words are indicated below:

HAND   **LAND**
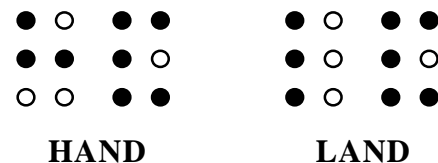
1.5.3 Grade II: It represents contracted form of Grade I Braille. Generally the Braille books for children contain Grade II Braille.

Illustrations

(i)   Contractions With One Cell Only

B   in Braille stands for   BUT
C   in Braille stands for   CAN
D   in Braille stands for   DO
E   in Braille stands for   EVERY
K   in Braille stands for   KNOWLEDGE
P   in Braille stands for   PEOPLE, etc.

(ii)   Contractions With Two Cells

Dot 5 N   Dot 5 F   Dot 5 M
Stands for NAME   Stands for FATHER   Stands for MOTHER

(iii) Group Symbols with Three Cells

C   H   A   N   C   E

CH   ANC   E

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Thus dots 4 and 6 in one cell which is a second cell in a group symbol stands for ANCE. Similarly, dots 5 and 6 in one cell in this position stands for ENC e.g. in PENCE.

(iv)   Abbreviation

A   B   A   C   R

Stands for   Stands for
ABOUT   ACROSS

B   R   L

Stands for
BRAILLE

The practice of reading and writing of Braille from grade 1 to Grade 1 and 1/2 to Grade 2 has now generally been given up, and Braille Grade 2 is used from the beginning of reading and writing instructions.

1.5.4 Grade III: It is a complicated form of Braille, mostly used as short-hand.

Illustrations

(i)   Contractions

Dots   F
4, 5, 6

Stands for
FOLLOWING

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2. Braille Reading and Writing : It should include

a. Pre- Braille Training
b. Reading Readiness Test
c. Reading Braille
d. Writing Braille

2.1 Pre-Braille Training

Before teaching Braille reading and writing skills, it is important that the child develops good tactual discrimination and finger dexterity. A child should be encouraged to perform various activities to develop hand coordination, finger movement, tactual discrimination and fine muscle coordination. It is advisable to develop a variety of Pre-Braille worksheets using different combinations of six dots. These worksheets train the child to move fingers from left to right, identify location of dots and identify differences among Braille dots.

Kirk Horton has suggested Pre-Braille Worksheets in his UNESCO publication *"Guides for Special Education No.6"*. These Worksheets can be easily developed using a Braille frame or a brailler, stylus and Braille paper:

worksheet a: Follow the Braille lines

- Develop a worksheet with Braille lines using dots 3 and 6.
- Make four lines of different lengths.
- Identify shortest and longest lines.

worksheet b: Follow the Braille line and identify breaks

- Make a worksheet like worksheet A, but leave a single four cell break in each line.
- Have the child identify breaks.

worksheet c: Follow the Braille line and identify the misplaced dots

- Make a worksheet using a single dot.
- in one place on each line, use a different dot.
- Have the child find misplaced dot.

In this way a number of worksheets can be developed.

2.2 Reading Readiness Test

As a sensory training, Reading Readiness Test, as recommended by Wolfgang Stein, should be administered. The test can be developed using cardboard, scissor, glue and paper. Three shapes viz. round, triangle and square should be cut into larger and smaller sizes. The shapes should be pasted on paper in the following sequence:

Worksheet No.	Items	Illustration
1.	Large circle	◯
2.	Large square	◻
3.	Large triangle	△
4.	One large circle and one small circle	◯ ◦
5.	One large square and one small square	◻ ▫
6.	One large triangle and one small triangle	△ △
7.	One large circle and two small circle	◯ ◦◦
8.	One large squares and two small squares	◻ ▫▫
9.	One large triangle and two small triangles	△ △△

Increase the small circle, square and triangle one each in the subsequent worksheets till their number reaches six. The last three worksheets should have six small circles, six small squares and six small triangles each.

Administer the test to the blind child who has been exposed to pre-Braille activities. Once the child is able to identify these worksheets clearly, he is ready for training in reading of Braille.

2.3 Reading of Braille

The Pre-Braille Training and Reading Readiness Test should culminate into reading of Braille. Wolfgang Stein advocates scientific approach to teaching of Braille and recommends the following sequence:

- Reading of Braille should be the first step
- Beginning should be made with recognition of dots
- Writing of Braille should be the last stage

2.3.1 System
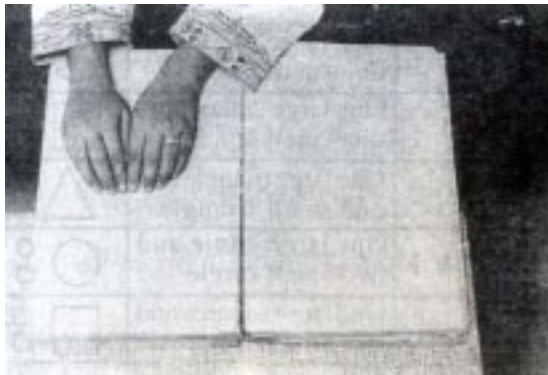
- Use both forefingers for reading Braille
- Read Braille with the tips of the fingers
- Fingers should be slightly bent and wrist should be slightly elevated
- Fingers should be slightly curved and resting lightly on the reading material
- Dots should be touched lightly and not pressed hard
- Read from left to right
- Most people read Braille with the right index finger, using the left index finger to read part of the Braille line or as a marker at the left margin to help find the next line.

2.3.2 Technique

- To develop the Braille mechanism, certain tactual discrimination activities should be undertaken.
- Start with Grade I Braille only.
- First Braille word introduced to the child should be a familiar word.
- Sentence-Word-Letter method of teaching Braille reading is recommended, sentence should be introduced to the child at the outset.
- Once a child is able to analyze the sentence, words of the sentences should be given in pieces.
- When the child is able to understand sentence and words completely, he should be encouraged to break words into characters.
- The analysis would help him to understand configuration of each character which is very essential for a blind child to understand.

2.4 Braille Writing

2.4.1 Method: Generally, Braille is written with a Braille slate, Inter Point Braille Frame, or a four line pocket frame and a stylus; or with a Brailler.

a. To write Braille with a slate or Interpoint Braille Frame:

- Paper is inserted between the top and bottom layers of the guide of the slate or the pocket frame.
- Paper is held firmly using locking mechanism in case of the slate or corner pins in case of a pocket frame.
- Braille dots are punched using the stylus downward into the paper through the cells of the slate or frame.

- Braille is written from right to left so that when the paper is turned over for reading, characters can be read from left to right.

b. To write Braille with a Brailler:

- Paper is inserted through a slot.
- Paper is rolled on a drum by rotating the knobs.
- Braille can be written on the top of the paper by pressing the necessary keys.
- On Brailler, the operator will write from left to right as dots are appearing on the upper part of paper.

2.4.2 Necessary Skills

a. Child must understand the meaning of each cell

b. Child should possess the following:

- Finger manipulation skills
- Fine motor coordination and control of muscles
- Competency to read familiar Braille words

2.4.3 Technique

- Ask the child to punch all the dots.
- Teach easiest formations, to begin with.
- Left hand should identify the Braille cells while the right hand punches the dots in the previous cells.
- Stylus should be held vertically.
- Left hand and the stylus which is held in the right hand should be held consequently
- It helps in identifying the correct dots.

2.4.4 Writing Table

It is essential that while reading and writing Braille, a person is sitting straight and that the Braille reading material is at a comfortable height.

In rural areas, writing desks are not available. It is advisable to provide a writing table with the following specifications to enable the child to maintain right posture while reading and writing Braille.

   a. Recommended size

        Length of the Top : 18"   (45.4 Cms.)
        Breadth of the Top: 12"   (25.4 Cms.)
        Height in the Front : 12" (25.4 Cms.)
        Height in the Rear : 14" (35.3 Cms.)

   b. Material

Structure	: Iron bars of 1 cm thickness
Top	: Sunmica or formica of 12 mm thickness
Fabrication structure	: Arc welding for metal : Top fixed using screws
Edging	: In the front portion of top to avoid slipping downward of the writing frame or book.

3. Development of Braille in India

The later half of 19th Century saw the advent of Braille as a staple medium of reading and writing for the blind in Europe as well as the United States of America. Braille was introduced by the Missioneries who established various schools for the blind at Amritsar (1987), Palayamkottai (1890), Calcutta (1897), Ranchi (1898), Mumbai (1900).

1902: Mr. J. Knowles and Mr. L. Garthwaite, representatives of the Foreign Bible Society invented the Oriental Braille and published it.

1922 (January): Mr. P. M. Advani, Principal, School for the Blind, Karachi expressed the need for evolving a common Braille code at a meeting of the Central Advisory Board of Education.

1923: Discussion in the Conference of the Workers of the Blind and the Deaf held in Mumbai on the possibility of having a common Braille code.

1938: Appointment of a Committee for the development of a uniform Indian Braille Code.

1941 (November): The Committee met for the first time and debated the issue.

1943: The Committee prepared a common Braille Code and circulated the same among various provincial Governments and institutions for the blind.

1944: Sir Clutha Mackenzie, Officer on Special Duty (Blindness) submitted the historical *"Report of Blindness in India"*.

1945: Sir Clutha Mackenzie appointed a committee composed primarily of Capt. A. X. Mortimer and Mr. Lal Advani for evolving a Standard Indian Braille Code.

1947 (April): Following the recommendations of the *"Report of Blindness in India,"* the Ministry of Education established a Unit to deal with education of the visually impaired for developing a Uniform Braille Code and setting up Braille Printing Presses in the Country.

1947: When India gained independence, 11 Braille codes were in use in various parts of the country:

- a. Shirreff (Urdu & Hindi) Braille
- b. Indian Braille of Dr. Nilkanthrai Chhatrpati
- c. Tamil Braille of Ms. Askwith
- d. Mysore and Kannada Code
- e. Chatterjee (Bengali) Code
- f. Oriental (Knowles & Garthwaite) Braille
- g. Shah Braille
- h. Advani (Sindhi) Braille
- h. Uniform Indian Braille by Expert Braille Committee
- i. Standard Indian Braille framed by an informal committee under the chairmanship of Lt. Col. Sir Clutha Mackenzie.

1949 (23rd April): Prof. Humayun Kabir, Joint Secretary, Ministry of Education approached the Director General, UNESCO urging upon development of a uniform World Braille Code.

1949 (December): UNESCO convened the preliminary meeting of the Advisory Committee on World Braille.

1950 (March): UNESCO convened an International Braille Conference in Paris for developing World Braille Code.

1951: UNESCO established the World Braille Council with Mr. Lal Advani as representative from India.

1951 (January): The Govt. of India accepted the recommendations of the International Braille Conference and proceeded to frame a Braille Code, named as *"Bharti Braille"* for Indian languages. It was submitted to the Central Advisory Board of Education for approval. The Board approved the code in principle and recommended that necessary modifications might be made in the light of the Regional Braille Conference.

1951 (February): Asian Regional Conference on Braille uniformity held in Beirut.

1951 (April): The *"Bharti Braille"* was finalized and recommended for its nation-wide use. It has become an international system as Nepal and Bangladesh are also using this code.

1988: Workshop convened at NIVH, Dehradun to adopt Nemeth Braille Code as *"Braille Mathematics Code for India"* (1972 publication).

4. Braille Presses in India

The Report on Blindness (1944) had recommended the establishment of a Braille Press at Dehradun. Around 1950, the Government of India had sent Mr. Kalidas Bhattacharya to be trained at American Printing House for the Blind, U.S.A. The Braille Press at Dehradun began functioning during April, 1951. Over the years number of Braille Presses have been established in different parts of the country.

1. AICB Computerized Braille Press
   All India Confederation of the Blind
   Braille Bhawan, Institutional Area
   (Near D.T.C. Bus Depot No. 1)
   Sector V, Rohini, Delhi 110 085
   Phone : 011-7054082
   Fax : 7050915
   E-mail : aicb@mailcity.com

2. Braille Printing Press

   Red Cross School for the Blind
   Ganjam District Branch
   Behrampur (Orissa)

3. Central Braille Press
   National Institute for the Visually Handicapped
   116, Rajpur Road, Dehradun - 248 001
   Phone   : 0135 744491
   Fax   : 748147
   E-mail : nivhddn@nde.vsnl.net.in

4. CFB Braille Press
   Christian Foundation for the Blind
   Pallavaram, Chennai 600 043

5. Computerized Braille Press
   K.K. School for the Blind
   Vidyanagar, Bhavnagar
   Phone   : 0278 429326
   E-mail : pnr@bhavnagar.com

6. Computerized Braille Production Unit
   Shri Ramakrishna Mission Vidayalaya
   Coimbatore 641 020
   Phone   : 0422 892441
   Fax   : 895066
   E-mail : srkvcoe@md3.vsnl.net.in

7. Computerized Braille Production Unit
   L.K.C. Shri Jagdamba Andh Vidayalaya
   Hanumangarh Road, Sri Ganganagar, Rajasthan
   Phone   : (0154) 21358/25358/26358
   Fax   : 20505/23328

8. Kerala Federation of the Blind Braille Press
   Kerala Federation of the Blind
   Trivandrum (Kerala)

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9. Government Braille Press
   Government Blind School
   Tilak Nagar, Sayaji Rao Road
   Mysore (Karnataka)

10. Government Braille Press
    Panchayat and Social Welfare Department
    Directorate, Marwari Lane,
    Sadar Bazar, Bilaspur (Madhya Pradesh)

11. NAB Braille Press
    National Association for the Blind
    11, Khan Abdul Gaffar Khan Road
    Worli Seaface, Mumbai 400 025
    Phone   : 022 4935370 Fax: 4932539
    E-mail : nab@giasbm01.vsnl.net.in

12. NAB Braille Press
    National Association for the Blind
    M. P. Branch, Indore (Madhya Pradesh)

13. NAB Braille Press
    National Association for the Blind
    Gujarat State Branch
    Vastrapur, Ahmedabad 380 015
    Phone   : (079) 6305082, 6305070
    Fax   : 6300106
    E-mail : bpa@vsnl.com

14. NFB Braille Press
    National Federation of the Blind
    Bahadur Garh (Haryana)

15. Regional Braille Press
    Government School for the Blind
    Poonamallee, Chennai 600 056

16. Regional Braille Press
    Malak Pet, Hyderabad (Andhra Pradesh)

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17. Regional Braille Press
    Ramakrishna Mission Ashram
    P. O. Narendrapur
    24 Parganas (West Bengal)

18. R. K. Computerized Braille Press
    Andhjan Kalyan Mandal
    P.D. Malaviya College
    Gondal Road, Rajkot 360 004
    Phone: 0281 223985

References

1. **Ahuja, Swaran (1992)** : *Bharti Braille Shikshak*, Mumbai : National Association for the Blind, P. 125

2. **Ahuja, Swaran** (1996) : *Education and Rehabilitation of the Blind, Beginning and Expainsive*, Mumbai : National Association for the Blind, P. 182

3. **Danielson, Ena** (1985): *Teach Yourself to Sight Read Braille - A Workbook, Burwood*, Victoria: Burwood Educational Centre for Blind Children, P. 112

4. **Haldar, Ras Mohun** (1943): *The Visually Handicapped in India*, Mumbai, Tracker & Co. Ltd., P. 284

5. **National Institute for the Visually Handicapped** (1991): *An Overview of Braille Development in India*, Dehradun, P. 41

6. **Punani, Bhushan; and Rawal, Nandini** (1995): *W. Stein & Integrated Education*, Ahmedabad: Blind People's Association, P. 138

7. **Royal National Institute for the Blind** (1969): *Braille Primer*, London : Royal National Institute for the Blind, P. 91

8. **School, Geraldine T**: (1986): *Foundation of Education for Blind and Visually Handicapped Children and Youth: Theory and Practice*, New Youk: American Foundation for the Blind Inc., P. 509

9. **Willonghby, Doris M; and Dufly, Sharon L.** (1989): *Handbook for Itinerant and Resource Teachers of Blind and Visually Impaired Students*, Baltimore: National Federetion of the Blind, P. 532

Chapter VII

ASSISTIVE DEVICES FOR THE VISUALLY IMPAIRED

Assistive devices for the visually impaired can be divided into the following six categories:

1. Educational Devices
2. Mobility Devices
3. Vocational Devices
4. Daily Living Devices
5. Low Vision Devices
6. Psychological Tests for Vocational Assessment and Training

1. Educational Devices

The educational devices can be further classified into the following broad eight categories:

1.1 Braille Duplicators and Writers
1.2 Writing Devices
1.3 Braille Paper
1.4 Talking Books and Tape Recorders
1.5 Reading Machines
1.6 Braille Computers
1.7 Mathematical Devices
1.8 Geography Devices
1.9 Science Devices

1.1 Braille Duplicators and Writers

1.1.1 Thermoform Machine: 'Indutherm' is an indigenous

semi-automatic Braille duplicating machine. It is useful for taking out multiple copies of the Braille matter on the Indutherm (or Braillon) sheets from the master generally prepared on the Braille paper. This machine operates on the principle of vacuum and high temperature.

Manufacturers

a. National Scientific Company,
   1958, Pilanji Kotla,
   Mubarakpur, New Delhi - 100 003

b. Asian Power Cyclopes,
   Rochipura, P.O. Majra, Dehradun 248 171
   Phone   : (0135) 620 488.
   Fax : 620 961

Similarly, Vacuum Forming Machine is also available in standard sizes. It can also be used for taking out multiple copies of Braille matter using PVC, HIP, Acrylic & ABS sheets with 2 mm thickness.

Manufacturer: IDEM Thermoformers, Wonderpack Industries, 72 I Floor, Shivlal Mansion, Lamington Road, Near Mumbai Central, Mumbai - 400 008

1.1.2 Braille Writers: It is an upward writing machine for writing on one side of the paper, enabling the Braille to be read as it is written. This machine can be compared to a normal type writer with a major difference that it has only nine keys, three for paper setting and six for embossing, the brailler embosses combinations of six dots in a Braille cell.

The Braille machine is made of metal with an enamel finish, with plastic key-tops and adjustable margin stops. The paper is roller-fed and line spacing is achieved by pressing a special key. The most popular Braille writers are:

- Stensby Braille Writers
- Perkins Braillers

- Taj Braillers
- Worth Perkins Brailler
- Minal Brailler

Manufacturers

a. Moksha Enterprises,
   F-6, Nacharam Industrial Estate,
   Road No. 18, Nacharam,
   Hyderabad - 500 076 Andhra Pradesh.
   Phone   : (040) 7151849
   Fax : 7813618

b. Worth Trust, 48,
   New Thiruvalam Road,
   Katpadi - 632 007, Tamil Nadu
   Phone   : (0416) 242739
   Fax : 243939
   Gram   : WORTH, Vellore
   Email   : worth@md3.vsnl.net.in

c. Minal Engineering Limited,
   214/A, Paradise Complex,
   Sayajigunj, Vadodara -390 005, Gujarat
   Phone   : (0265) 323 493, 332 962
   Fax : 641216

1.2 Writing Devices

i. *Interline Braille Frame*: is used for writing standard character interline Braille. The frame comprises a wooden board, a metal guide, a reversible paper clamp and a stylus. The clamp fits at the top of the board and has a small swivel stud for locking and holding Braille paper. When one side of the paper has been Brailled, the clamp with the paper still held, is turned over as

a unit. The binding margin is made automatically.

ii. *Taylor Postcard Frame*: It is used for writing small character Braille on one side of the paper. The corner pins are arranged in such a way that the Braille can be read without removing the paper from the frame; when the top section is lifted, the paper remains attached to it.

iii. *Pocket Braille Frame*: The four-line pocket Braille frame produces small character Braille on one side of the Braille paper. This is specially used for making small and occasional notes.

iv. *Stylii*: These are produced with handles of various shapes to suit individual needs. The points of all stylii are made of stainless steel and the handles are of polished hardwood or synthetic material.

v. *Braille Kit*: is a rexine coated or a decorative wood box 36 Cms. by 28.5 Cms. with a weight of 3085 Gms. and contains the following items:

- Braille Writing Frame
- Braille Writing Pocket Frame
- Rubber Sheet
- Foot Ruler
- Compass Set
- Two Stylii
- Folding Stick or Abacus and
- Signature Guide.

vi. *Pragnya* Sketching Device

Mrs. Pragnya Bhatt and Mr. Dilip Bhatt, father of a low vision child, Nikunj and volunteers of Blind People's Association have developed an innovative sketching

device. It enables a visually impaired child as well as a low vision child to create simple sketches and diagrams out of a thread. It is based on principle of using acrylic thread as "writing ink" and nylon fabric fastener strips as a "writing slate".

Product Design: Acrylic thread of a contrast colour that works as refill is passed through the empty body of an open ended ball pen, keeping the other end attached to bobbin spool. The thread is wound on the spool
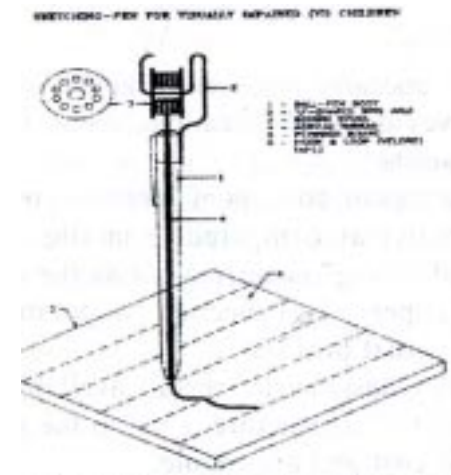
that rotates about a wire axle, attached to the upper part of the ball pen. The nylon fastener stripes are stitched together width wise and pasted on the wooden board to make 1'x1' area.

Operation: The child holds the pen as any other normal pen for a sighted person and makes contact of the thread over the slate surface. Keeping continuous touch with the surface, the child glides the pen in different directions and the thread delivery is maintained smoothly through the rotating spool.

A line can be terminated by snapping off the thread by using a sharp stationary blade. A continuous running thread can also make different shapes like circles, rectangles, curved lines, letters, graphic symbols, maps etc. The drawn picture can be easily "erased" by simply pulling away the thread from the slate surface and rewinding it again over the spool. The child can immediately feel the shape by moving fingers over the thread surface and add, correct or erase the line quickly. It enables interaction of the child with the writing media and encourages drawing of various objects. A low vision child may see the shapes by holding the board close to eyes.

Advantages

- Self operated excellent user friendly device
- Serves as useful educational media for the teaching personnel
- Operates on concept of "draw as you think" which is better as compared to tactile devices where "embossing" is carried out on the reverse side of the paper, metal sheet etc. to get mirror image of the actual profile.
- Simple design using readily available components.
- Easy to manufacture, even in the rural areas.
- Low cost and affordable.
- No training manual required as it is easy to operate.

Awards

i. **National Award**: Mr. Dilip Bhatt and Mrs. Pragnya Bhatt have been conferred the National Award for outstanding technological invention in the field of welfare for the Persons with Disabilities by the President of India on 3rd December 1997.

ii. National Research and development Corporation **(NRDC) Science & Technology Award**: The inventors were also conferred Science & Technology Award on 26th January 1998 on the occasion of Republic Day.

iii. World Intellectual Properties Organization (WIPO) **Gold Medal** for the best product patented from the developing countries.

iv. Displayed in the exhibition titled **"Heralding the New Millennium"** on the occasion of 87th session of the Indian Science Congress during 3-7 January, 2000 at Pune as "Innovative India".

v. Patent has already been filed for this device under Patent Cooperative Treaty (PCT) by the National Research and Development Corporation, New Delhi.

Manufacturers

a. National Rehabilitation Engineering Institute, Blind People's Association, Vastrapur, Ahmedabad-380 015
Phone   : 6305082, 6304070
Gram   : "BLINAB"
Fax : 6300106
E-mail   : bpa@vsnl.com
Web: http ://education.vsnl.com./bpa_ahmedabad

b. National Institute for the Visually Handicapped, 116, Rajpur Road,
Dehradun - 248 001 Uttar Pradesh.
Phone   : 744491, 744578
Fax : 748147
Gram   : "NIVH"
Email   : nivhddn@nde.vsnl.net.in

c. Moksha Enterprises

1.3 BraillePaper : The standard size of Braille paper is 22"X28" and weight 8.6 kg. per gross.

Manufacturers

   a. Titaghar Paper Mills Ltd.
   b. Andhra Pradesh Paper Mills Ltd.
   c. West Coast Paper Mills Ltd.
   d. Rohtas Paper Mills Ltd.
   e. Orient Paper Mills Ltd.

1.4 Talking Books and Tape Recorders

1.4.1 *Talking Books*: The material recorded on cassettes has emerged to be the most popular mode of imparting education to visually impaired persons. As Braille books are very heavy and many newly blind persons are not able to learn Braille easily, talking books are emerging to be the most viable alternative.

For listening to the talking books, the conventional cassette players with the compact cassettes with a playing time of either 60 or 90 minutes is generally used.

The Major Talking Book Libraries in the country are:

   a. Talking Book Library,
      NIVH, Dehradun

   b. M. P. Shah Talking Book Library,
      National Association for the Blind,
      11, Khan Abdul Gaffar Khan Road,
      Worli Seaface, Mumbai 400025
      Phone   : (022) 4935370, 4936930
      Fax : 91-22-4932539
      Email   : nab@giasbm01.vsnl.net.in

   d. A N Kinariwala Talking Book Library,
      BPA, Ahmedabad

   e. Blind Relief Association,
      Lal Bahadur Shastri Marg,
      New Delhi - 110 003
      Phone   : 436 1376
      Gram   : "BLINCENTRE".

   f. Poona Blind Men's Association,
      82, Rasta Peth, Pune
      Phone   : (0212) 626433 627 036
      Fax : 628741.

Many regional and district level development agencies for the visually impaired have their own small talking book libraries.

1.4.2 *Digital Tapeless Recorder*: Kun Yoong Trading Co. RM.1302, Hwanghwa Bldg., #832-7, Yeoksam-Dong, Kangnam-Ku, Seoul, Korea has developed Digital Tapeless Recorder (Check-back) for the Blind. The blind people can use it alone without someone's help. It has a special voice prompt for the blind which includes a voice guide, easy research mode, volume adjustment and option for use of earphone.

1.5 Reading Machines

   i. Kurzweil Reading Machine: A portable optical scanner that reads type-set or type-written text and turns it into speech. Its features include:

- a large memory to provide improved processing of incoming text;
- an automatic contrast control;
- tools for format analysis;
- multi-lingual capabilityfor textinany of these veral languages;
- communication interface which allows it to serve as an input or output device with other data or text processing equipment.

Manufacturer:

Kurzweil Educational Systems,
Inc. 411 Waverley Oaks Road,
Waltham, Massachusetts 02154, USA.
Tel.: +1617 893 8200
Fax : +1617 893 4157
Email   : info@kurzweiledu.com
Web   : http://www.kurzweiledu.com

Supplier in India:

Empire Industries Ltd.,
Empire House, 414,
Senapati Bapat Marg, Mumbai - 400 013

ii. *Optacon*: is a book-sized electronic device with a movable camera, the size of a pocket knife and a tactile screen the size of a fingertip which presents a tactile image on an array of vibratory pins. The reader passes the camera over printed material with his right hand and his left index finger feels in vibratory relief the image the camera sees. The manufacturer claims that an experienced Optacon user reads up to 90 words per minute, about half his Braille reading speed.

Manufacturer:

Telesensory Systems Inc.,
P.O. Box 7455, Mountain View,
California 94039-7455, U.S.A.
Tele   : +1415335 1800
Fax : 1414 335-1816,
Email   : tele@netcom.com,
Web   : http://www.telesensory.com/index.html

1.6 Braille Computers

i.   *Braille Window*: is the Braille-display for connection to all sort of IBM compatible personal computers.

ii. *Keytone*: is a portable information handling, word-processor and computer access device that talks to its user.

iii. *EHG-BW/ 2-PIEZO* is a monitor and key board which provides output in raised dots and can be conveniently used by the visually impaired persons.

iv. *Galaxy Piezo*: is a special computer for the visually impaired and it gives output in embossed dots.

v.   *Galaxy speech*: is a special computer for the visually impaired with speech output

vi. *Braille'n Speak*: is pocket size note taker. It can be used for word processing, as a calculator, as a clock and a calendar. It can store 200 pages of Braille text.

vii. *Versa-Braille II+*: is recognized as a convenient Braille operating system. It can be used for editing, programming and word processing. The input is from six keys and output is in the form of raised dots. It is a product of Telesensory Systems Inc.

viii.   *Index Braille*: Index Braille is a Sweden based privately owned business with a mission devoted to development and production of Braille Embosser.

The company has introduced Double-sided Braille Embosser, popularly known as "Index Everest". It has a high speed Interpoint Braille Embosser which uses normal cut sheet. Over the years, the Everest has proved to be one of the most reliable Embossers on the market.

Manufacturer

Index Braille
Hantverkvagen 20, Box 155,
S-95423 Gammelstad,Sweden
Phone   : +46-920 203080
Fax   : +46-920 203085
E-mail   : info@idexbraille.com
Web   : www.indexbraille.com

Distributor for India

Sparsh Products
151-5, Raipur, Road,
Dehradun - 248001 Uttar Pradesh
Phone   : +91-135 735011
Fax   : +91-135 651108, 650944
E-mail   : reetarao@del3.vsnl.net.in

ix. *Speech Synthesizers*: A speech access system converts text from a computer into spoken words. It is the hardware device that does the speaking in a speech access system.

a.   *External device*: It connects to a computer externally and comes with a speaker and a socket for headphones and can be moved around to different machines.

b.   *Internal device*: It comes as a chip or a circuit board that must be inserted inside the computer with sockets for speakers and headphones. It can be moved around to different machines, it works faster than an external device.

c.   *Soft-ware based device*: It is loaded as software on a compatible computer and it gives speech out through the sound system of the computer itself. The

Microsoft Voice is useful for reading the documents and for operating window commands with the help of multimedia kit.

Important features of synthesizers include

- voice quality
- speed at which text is converted to speech
- memory requirements, and
- compatibility of the synthesizer to the computer (Mac or PC) and the number of languages available.

d.   *Language software*: The Indian Institute of Technology (IIT) Chennai has developed Braille Software as well as Language Software which enables a visually impaired person to access computers for Braille as well as language outputs in all the Indian languages. The Vidya Vriksha Training Centre for the Disabled, a Chennai based NGO is imparting training to visually impaired persons in the use of software. It is also providing the software completely free of cost to the users and the institutions. It has also developed a system of keyboard mapping and operations in Indian languages and instruction manual for use of the special version of the ITI Multilingual Software.

1.7 Mathematical Devices

i.   *Taylor Arithmetic Frame*: The surface of this aluminum frame is divided into star shaped holes with eight angles, thus allowing the double-ended metal types to be placed in different positions according to a set system. This frame is suitable for teaching arithmetic to visually impaired persons.

ii. *Arithmetic and Braille Writing Slate*: This has a Arithmetic frame on one side and a Writing slate on the other. It also has reversible type clamp and two guide lines supplied with a wooden stylus.

iii. *Abacus*: A simple instrument for performing rapid arithmetical calculations. It consists of a frame holding thirteen vertically arranged rods on which beads slide up and down. The beam supporting the beads is marked with a raised dot at each rod position and a raised bar between every third rod. The bars serve to indicate the decimal point and other units of decimal measure.

iv. *Talking Calculator*: Audible calculator in synthesized speech. Useful for calculation, clock, alarm and calendar. Manufactured by Casio and Sharp companies of Japan.

v. *Primary Mathematics Kit*: specially designed for the visually handicapped children to comprehend mathematical concepts. It contains:

- a plastic box
- slide strips
- number boards
- fractional strips
- Braille clock
- geometrical shapes - geometrical figure tray
- magnetic board, and
- geometrical devices.

Manufacturer : NIVH, Dehradun

vi. *Spur Wheel*: A serrated wheel revolving in a plated metal handle. It is used for making continuous embossed lines on the reverse side of the paper.

vii. *Compass Set*: It includes a foot ruler, a protractor and a set square in nylon and a spur wheel. It enables visually impaired students to use the same techniques as his sighted counterpart. The foot ruler and set square have embossed markings for their convenience. The compass has a removable component fitted with a toothed wheel for drawing embossed dotted lines on the reverse of the Braille paper.

viii. *Geometry Mat*: A sheet of rubber for use as a base in conjunction with the spur wheel and Braille paper for making geometrical drawings.

ix. *Opisometer*: A bell rings each time the disc moves a distance of one meter. Useful for mapping and understanding mathematical problems in length and perimeter.

x. *Other mathematical devices are*:

- Three-in-one: Arithmetic Frame, Writing Frame and Abacus
- Composite Braille Slate: Abacus, Arithmetic Frame, Rubber Mat and Wooden Frame
- Graded Abacus
- Fraction Boards
- Counting Device
- Hundred, Tens Units Board
- Arithmetic as well as Algebraic Types
- Geometric Shapes and Solids

Suppliers of educational devices are:

a. NREI, BPA, Ahmedabad
b. NIVH, Dehradun
c. Asian Power Cyclopes

d. Moksha Enterprises

e. Voltas Ltd., Kaybee Cell,
   Volkart Building, 19 J N Heredia Marg
   Ballard Estate, Mumbai - 400 038

f. Advance Engineering Works,
   22 Lytton Road, Dehradun - 248 001
   Uttar Pradesh,
   Telefax   : (0135) 654530

g. Artificial Limbs Manufacturing Corporation,
   G T Road, Kanpur -   208 016 Uttar Pradesh
   Phone   : (0512) 250173
   Fax : 252617
   Gram   : "Artlimbs"

h. Pneumatic Controls,
   35-B, Rama Road,
   New Delhi 110 015

i. NAB Louis Braille Memorial Research Centre,
   Rustom Alpaiwala Complex,
   124, Cotton Depot, Cotton Green,
   Mumbai - 400 033
   Phone   : (022) 3756802

1.8 Geography Devices

1.8.1 *Sensory Quill*: It is an equipment for obtaining a raised line format of any writing or drawing. The height and texture of the line can be altered. Useful in learning handwriting skills, mathematics, science, drawing and spellings.

   Manufacturer:

   V. R. Vardhman International,
   Vardhman House, 1, Raj Block,
   Naveen Shahadara, New Delhi 110 032

1.8.2 *Maps and Globes :*

i. *Raised Relief Plastic Maps*: Vacuum formed plastic maps printed in strong colours with names in letterpress for the benefit of person with low vision. The main towns are shown by large dots and principal rivers by depressions. Braille symbols denote the names of seas, main rivers and towns, a key to which is given in the guide. The boundaries on political maps are indicated by raised lines.

In India, political and physical maps are available for Asia and India. The vacuum printed diagrams are also available for various body systems, anatomy, physiology etc. at the following address:

a. Bharat Educational Stores, Chippi Tank, Meerut Uttar Pradesh

b. Krishna Models Manufacturing Co. Ltd., Nai Sarak, Near Chandni Chowk, New Delhi- 110 015

ii. *Relief Globes*: A plastic globe in textured relief. The land masses are shown in different colours. The principal towns are indicated by raised dots; rivers and lakes by depressions. Dotted lines indicate the tropics, arctic, and antarctic circles, the international date-line and meridians. The names of oceans and the main land are shown in Braille.

Nystrom's Bathymetric World Model is raised relief map of the world with oceans drained. All under water features are exposed. A cassette recording explaining the features is supplied with the product.

iii. *Braille Diagram Board*: Metal sheet fixed on a board with closely formed holes in which round headed

pins are stuck to form maps and diagrams.

Manufacturer: NIVH, Dehradun

1.9 Science Devices

1.9.1 *Conductivity Apparatus*: Demonstrates the difference in the heat conductivity of copper and iron. It consists of a wooden stand with horizontal heating rods.

1.9.2 *Three Dimensional Raised Relief Plastic Charts*: Rigid PVC sheet, printed and formed in multi-colours. The following charts are available:

i.   *Botany General*: includes typical plant cell, plant meiosis, plant mitosis, Ribo-Nuleic Acid, Bacterial forms, Spirogyra   and Funaria - common Moss in Botany

ii. *Botany Advance*: depicts fertilization, T. S. dicot leaf, dicot stem, types of placentation

iii. *Zoology*: Vertebrate and Invertebrate

iv. *Human Physiology and Human Body Systems* including human skeleton, circulation system, heart, nervous system, a section of the brain, muscles, digestive system, the ear, the nose, and the eye.

v. *Human Reproduction* includes male and female reproduction organs, fertilization and foetus

Manufacturer :

Bharat Graphics,
194, Industrial Area Phase II,
Chandigarh - 160 002

2. Mobility Devices

2.1 Canes: The following types of canes are available:

i.   *Symbol Canes*: Made of sections of light metal tubing, generally aluminum or its alloys, joined through the center by means of an elastic cord. The canes fold up conveniently for carrying in the pocket or handbag. When required for use, the top section is held and others automatically fall into position.

Devised for portability and not intended to be used other than as a guide aid and an indication that the user is a visually impaired person. This cane is popularly known as a Braille folding stick.

ii. *Guide Canes*: A stronger version of the symbol cane and intended to be more of a mobility aid but not a means of support. The four sections, covered with ribbed plastic sleeving, are joined through the center by means of an elastic cord enclosed in nylon sleeving. It is fitted with an elastic loop handle and a standard nylon tip.

iii. *Long Canes*: A wooden or aluminum stick of 85 to 90 centimeters. Three models are available:

- rigid
- two piece, and
- four piece.

The aluminum cane is generally sleeved with PVC material, having a rubber grip and a nylon tip with or without a crook.

iv. *Electronic Travel Devices*: An ETA is described as a device that sends out signals to sense the environment

within a certain range or distance, processes the information received and furnishes the person with relevant information about the environment. Most of these devices are based on integrated circuits and emit sound or tactile signals.

As ETAs are not available and prevalent in India, it is not very necessary to give description of these devices. However, for the sake of information, these devices are listed below:

- Lind Say Russel E-model Path Sounder
- C 5 Laser Cane
- Ultrasonic Torch
- Sonic Guide
- Light Probes
- Mowat Sonar Sensor
- Nottingham Obstacle Sensor
- Electro-cortical Prosthesis
- Electro Roftalm
- AFB's Computerized Travel Aid
- Polaroid Ultrasonic Travel Aid

For details about ETAs, refer to NIVH publication *"Selected Abstracts & Annotated Bibliography on Orientation and Mobility"*

2.2 Mobility Show Card: A plastic show card to help visually impaired persons to cross busy roads and to hail a taxi.

2.3 Mini Beeper: A battery operated, hand-held electronic gadget having application in mobility, recreation, sports and obstacle location.

3. Vocational Devices

The vocational devices should ensure the following:

- A visually impaired person's ability to perform a definite technological operation.
- Employment of various means of mechanization with the aim of lightening jobs for such person.
- Complete safety of a person's labour.
- Preservation of residual touch, sight and hearing.
- High quality of manufactured products.
- Increase in labour productivity.
- Self reliability as regard the operations he is required to perform.

3.1 Goniometer : It is an instrument to measure body angles and it is useful to physiotherapists.

3.2 Attachmentto Lathe : It enables the visually impaired to operate the Capstan as well as a Central lathe. It is a attachment which can be mounted on the movement bar and can be fixed to enable the person to operate the machine to a desired length.

A new device has also been developed which emits a sound signal when the tool carriage reaches a desired point. A movable switch is fitted on the movement bar and can be fixed as desired. Whenever the tool carriage touches the switch, the sound signal is emitted.

3.3 Spot Welding :I thas been developed by using:

- 5 Kg E-type lamination cord,
- One bobbin,
- 25 and 16 S.W.G. copper wires,
- One carbon rod,
- One combination plyer,
- Metal box, and
- One line cord wire.

As it has low voltage with high amperage current, it is safe for visually impaired persons to carry out the soldering of joints.
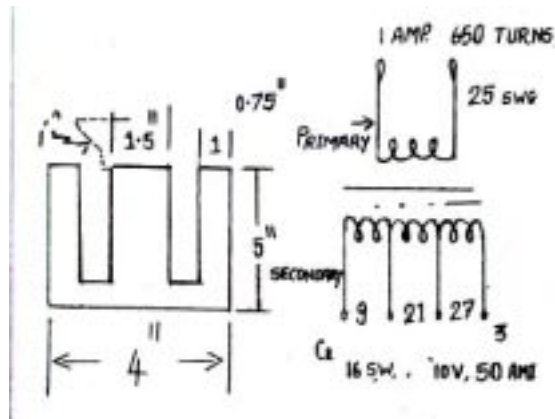
Advantages

- No risk of any electric shock to the operator
- Low cost
- Portable
- No need for dry soldier.

Limitation: It can, however, be used only for copper wire soldering.

3.4 Continuity Tester : It is a low voltage electric circuit for testing continuity of winding wires in case of motor winding or other such operations. The light signal is replaced by the sound signal for enabling the operators to establish continuity of the wires.

Material: It has been developed by using:

- Two transistors (BC 148 and AC 128)
- One resistance (47 Kilo-ohms)
- One capacitor (0.02UF)
- One speaker (8 Ohms, 500 MW)
- Two testing probes

- One PCB, and
- One assembly case.
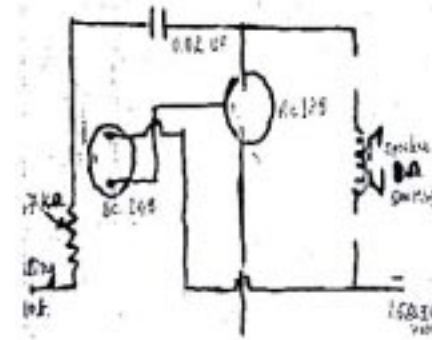
Advantages :

- Use of 1.5 volts DC current ensures safety of user.
- As it reflects difference between high to low resistance and current leakage, it is sensitive.
- As tone resistance can be altered by changing the capacitor value and it emits audio output, a visually impaired person can use it conveniently.
- As no electric AC current is required, it can be used in the field conditions.
- It is compact, easy to carry and low cost.

3.5 Braille Micrometer : The Centre for Biomedical Engineering, Indian Institute of Technology, New Delhi has developed a new attachment of the precision micrometer for the visually impaired. With the use of the attachment, conventional micrometer readily available in the market is adapted for the use of visually impaired persons.

Design of Attachment: The thimble scale is amplified by attaching a circular toothed brass disc of 55 mm diameter. Each degree of rotation is represented by a tooth of the brass disc, such that one fiftieth of the pitch is represented by 3.45 mm which can be easily perceived by touch. To improve the efficiency in the measurement, the disc is marked with one and two projecting

rivets after each 5 and 10 degrees of rotation respectively. In order to differentiate these from the zero marking, an additional rivet is provided at the initial point. The reading is obtained by counting the teeth clockwise from the zero marking to the tooth which matches with the edge of the linear scale.

To amplify the pitch of the linear spindle scale, a nut on an additional screw moves linearly by the amount equal to the pitch of the attached screw. This gives an additional linear displacement corresponding to each revolution. Choosing a suitable pitch of 1.55 mm, a movement of 2 mm was obtained for one rotation, thus increasing the resolution four times.
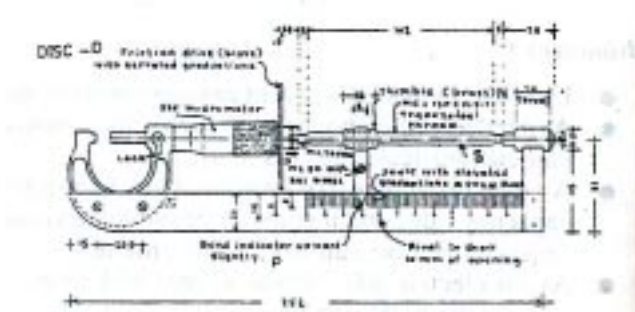
For a 25 mm, the total length of 100 mm is traversed by the pointer which can be easily managed by one hand.

Reading on the Micrometer

- Check for zero error by closing the gap between the anvil and the spindle.
- Count from initial point the tooth which matches with the edge of the fixed scale. The error noted is as (+-e) number of teeth.
- Place the object to be measured between the jaws and the thimble is rotated to grip the job.
- Take the pointer reading (p) on the fixed scale and then read the dial counting the number of teeth clockwise from the zero point (t).

- Interpret the measured value as 0.5p+t+-e

Advantages:

- Simple and can be made locally at nominal cost
- As the least count 0.01 mm same as that of the original model
- Same attachment can be fitted on to the micrometer of various ranges
- Can be attached to conventional existing micrometer easily

Manufacturer: NREI, BPA, Ahmedabad 380 015

Sales price :   Attachment   - Rs. 250
                    Micrometer   - Rs. 800

3.6 Other Vocational Devices: The American Foundation for the Blind, 15 West 16th Street, New York, NY 10011 is supplying a variety of tools and instruments for the visually impaired as listed below. These tools are yet not available in the country.

- Rotomatic Rule
- Folding Boxwood Rule
- Stanley Saw Guide
- Stanley Drill Guide
- Light Probe
- Metal and Voltage Detector
- Stanley Combination Square
- Stanley Caliper Rule
- Starrett Micrometer
- Ohaus Port-O-Gram Talking Scale
- Audible Carpenters Level

4. Daily Living Devices

These devices can be further classified into the following five categories:

4.1 Clocks and Watches
4.2 Games and Puzzles
4.3 Sports
4.4 Kitchen Equipment
4.5 Personal Devices

4.1 Clocks and Watches :

i.   *Alarm Clock*: A standard alarm clock adapted for the use of the visually impaired. It has strengthened hands and an open plastic dial having the hour positions indicated by two raised dots at the 3, 6, 9, 12 positions and single dots at the remaining hours.

Manufacturer: HES Limited, Patel Estate,
Jogeshwari (West), Mumbai - 400 102

ii. *Travel Alarm Clock*: This adapted clock as mentioned above is fitted into a case. The whole clock is packed into the case when folded. When opened, the case also serves as a stand for the clock.

ALIMCO Alarm Clock has time setting knobs. The dial is encased in a transparent plastic cover which can be easily removed from the top for obtaining access to the clock dial. The raised dots are provided for indicating hours with two dots for 3,6 and 9 position, 3 dots for 12 hour position and single dots at the remaining hour positions.

Manufacturer: ALIMCO, Kanpur

iii. *Pocket Watch*: A hunter watch, the hinged cover of which opens when the winding knob is depressed.

Fitted with strengthened movements and dots as mentioned earlier.

iv. *Ringer Timer*: A one-hour ringer, in streamlined plastic case for timing any operation where an audible reminder is required. Each five minute period is indicated on the embossed setting dial by two dots and the first quarter hour is additionally marked to show the individual minutes.

v. *Wrist Watch*: has the appearance of an ordinary watch, with the front cover being fitted with a transparent centre. The front can be lifted with a lever mechanism when the winding knob is depressed. The general arrangement for dial marking is two dots on the 3, 6, 9, 12 positions, and a single dot at the intervening hours, but for the 12 o'clock position two or three dots according to the particular watch.

Manufacturer: Hindustan Machine Tools Ltd.,
Watch Marketing, Division,
26/1, Levelle Road, Bangalore - 560 001.

vi. *Talking Time*: This is an electronic watch as well as alarm clock fitted with an electronic device which announces the time whenever the knob is pressed. It is possible to set time, date, day and alarm etc. All the settings are audible in signals, it is thus possible for a visually impared person to do the setting himself.

The most popular brands are Sony and Sharp. In India, Sikkim Time Corporation Limited (SITCO), Sikkim has introduced Talking Wrist Watch. The SITCO has established Marketing Divisions in all the major towns in India.

4.2 Games and Puzzles :

i. *Playing Cards*: Superior quality standard playing cards with the reverse embossing in standard Braille on the top left corner.

ii. *Chess*: A wooden board with the black squares raised and all the squares drilled in the centre for the reception of the pegged chessmen. Holes are provided at each end for pieces not in play. The pieces are of uniform height, the white having a point at the top to distinguish them from the black.

iii. *Dominoes*: Made of plastic and having raised black dots on a white background with black inset pieces on the reverse. These dominoes are ideal for players with low vison also.

iv. *Brahma Puzzle*: The puzzle consists of three pegs on a wooden base and eight discs of different diameter each with a hole in the center. The purpose is to transfer all the discs from the peg to another without allowing any disc to be placed over a smaller one.

v. *Audible Ball*: Made of strong good quality rubber in which holes have been punched. Small metal balls are inserted for creating sound enabling the ball to be located when in play.

An ordinary good quality ball of plastic of 5 Cms. radius can be converted into an audible ball by drilling a hole, putting small size pebbles and then sealing the hole using the soldering rod. This ball can be used for playing cricket. Such a ball has been developed by the National Institute for the Visually Handicapped, Dehradun is the most appropriate.

vi. *Draught Board*: A wooden board with sunken playing squares. The colours of the men are distinguished by size. Pieces of double thickness are used as kings.

A variety of other games as listed below have also been adapted for the visually impaired:

- Bezique Maker
- Bridge Scorer
- Lexicon
- Happy Family
- Whot
- Patience Board
- Chess Clock
- Jigsaw Puzzle
- Electronic Ball
- Beetle Game
- Centre-peg
- Dice and Dice Cup
- Nine Men's Morris
- Scrabble
- Unilock Word Building Device
- Tic-Tac-Toe
- Checkers Set
- Rattle Bells

Only Chess, Playing Cards, Nine Men's Morris, Draught Board and Checker Set and various puzzles are available in India. Other games are available from the Royal National Institute for the Blind, London.

Manufacturers :

a. NREI
b. Asian Power Cyclopes
c. Advance Engineering Works

d. Pneumatic Controls, New Delhi

e. Pinball Manufacturing Co.,
   147, GIDC Makarpura Industrial Estate, Vadodara

f. Latha Industries,
   89/1 Triplicane High Road,
   Triplicane, Chennai - 600 005

4.3 Sports :

i. *Football, Basket Ball and Soccer Ball*: These are equipped with a small electronic beeper which is battery powered and emits a compact sound. The beeper is held within a moulded cavity designed for easy access to 'on & off' switch. These devices can be imported through V. R. Vardhans International, Vardhans House, 1/Raj Block, Naveen Shahadara, Delhi - 32

ii. *Cricket*: is becoming very popular in India. The standard rules have been drawn. It can be played using the audible plastic ball as mentioned earlier.

iii. *Stick Walking*: The ordinary strong bamboo sticks with foot rest at a height of 30 Cms from the ground can be used for training the visually impiared in stick walking.

iv. *Swimming*: is also emerging to be a popular sport among visually impaired persons. The normal swimming pool with sound indicators on the sides can be used for training them in swimming.

v. *Athletics*: The normal track with some precautions and safety measures can be used for training the visually impaired in race, shot put, javelin throw, bag-walk, musical chair, hit the target etc.

vi. *Table Tennis*: has become a popular in-door game

for the visually impaired in many South-East countries. The normal table tennis table with some modifications in the net and the sides can be used for the purpose.

4.4 Kitchen Equipment

4.4.1 *Equipment Adapted for the Visually Impaired* :

i. *Egg Poaching Ring*: An adaptation of standard egg ring to enable visually impaired persons to fry or poach eggs, and to serve them easily. It has a handle vertically attached to the egg ring.

ii. *Measuring Jug*: A heat proof clear glass jug of standard capacity with raised markings inside to indicate the specific volume. With the use of fingers, a visually impaired person can measure the volume.

iii. *Bread Cutting Box*: An adjustable slide is fitted to gauge thickness of the slice. It enables visually impaired persons to cut the loaf of bread into even slices using a standard bread knife.

iv. *Liquid Level Indicator*: A simple electronic device, powered by a battery, enables a visually impaired person to ascertain the level of liquid being poured into a cup. It emits a sound signal when a particular level is reached.

v. *Self Adhesive Labels*: These plastic labels can be embossed with Braille and used for labelling a wide variety of articles.

Note: These equipments are still not available in India. These have to be imported from the Royal National Institute for the Blind, London.

4.4.2 *Open Market Products* with Special Relevance for Use by the Visually Impaired

a. Tomato Slicer
b. Chilly Cutter
c. Kitchen Helper
d. Vegetable and Fruit Scrapper
e. Multi-purpose Scrapper
f. Egg Beater-cum-Juicer
g. Gas Lighter
h. Milk Cooker
i. Pressure Cooker
j. Jar & bottle opener
k. Pan holder

4.5 Personal Devices

i. *Sound Beacon*: This pocket size electronic device emits a sound which can be varied from a loud continuous whistle down to low intermittent beeps at various rates. It is generally used as a homing device.

ii. *Notex*: It consists of a rectangular base and flaps made of high-density polythene hinged together. It differentiates Indian currency notes of different denominations. It considers length and breadth of a currency note for its differentiation.

Available From: NAB Louis Braille Memorial Research Centre

iii. *Magnets*: Round, square and U-shaped magnets for picking up pins, small nails and other iron or steel objects.

iv. *Signature Guide*: A template to guide the visually impared persons in placing signature in proper position on letters, cheques etc.

v. *Address Templates*: Made of cardboard with four raised lines to guide a visually impaired person to write his address on Inland letters and envelopes.

vi. *Light Probe*: Full function light detector may be adjusted for desired sensitivity to light.

vii. *Location Finder*: Find your house, apartment, or office easily with portable, light weight location finder. A siren, attached outside location, will sound on pressing transmitter attached to a key chain.

viii. *Other Personal Devices*: The American Foundation for the Blind and Maxi Devices are supplying a variety of personal devices for the visually impaired persons as listed below. These are so far not available in India.

- Thermo Voice: announces temperature
- Talking Blood Pressure & Pulse Monitoring Kit
- Becton Dickinson Magni Guide: for accepting barrel of insulin syringe
- Insulin Needle Guide
- Talking Blood Glucose Monitoring Kit
- Big Print Address Book
- Talking Wallet
- Locklid Saucepan
- Weight Talker
- Keyfinder
- Clothing Identifiers
- Tactile Braille Signs
- Eye-Ease Eyedrop Guide
- Medicine Spoon

5. Low Vision Devices :

There are two main types of low vision devices:

- optical devices which use lenses to magnify objects
- non-optical devices and techniques which make objects easier to use

5.1 VTS Link: is a portable large print computer and work station, specially designed to meet diverse needs of the visually impaired. It provides people with low vison with the most comprehensive solutions to computer access available today. It features a custom-made high contrast flat display screen which presents a sharp clear image of character up to 75 mm.

5.2 Visualtek: Closed circuit TV magnifying system magnifies up to 60 times the normal size with wide variation of light intensity and both positive and negative images.

5.3 Schmidt Reader: is also a close circuit TV and functions on the same principle as the Visualtek.

5.4 Magnifying Lenses: have many applications other than reading: they make everything bigger and brighter. Following models of magnifier lenses are available:

i. *Mounted Magnifying Lens*: It has an extra large sized Fresnel lens as magnifier. It provides large visual field and leaves both hands free for manipulation of reading material or hand work. It is useful for quick scanning of large surfaces and objects.

ii. *Flexible Arm Illuminated Magnifier*: It has a large sized precision glass lens and a circular tube light mounted around the lens. The lens-light assembly is mounted on a spring balanced stand with feather touch movements and a reach of 900 mm, allowing the lens to be placed in any position and freeing both hands of the observer for work. It is an ideal aid for inspection, quality work in electronics, instrumentation and precision engineering industries, gems and jewellery, geology and hospitals. (Lensel Product Catalogue)

iii. *Magnifying Binoculars*: handy in close work, both hands free.

iv. *Book Magnifier*: Having a large field it enables reading of printed material such as newspapers, paper back books, fine legal print etc. It mangifies one page at a time.

v. *Illuminated Magnifier*: Provides magnification along with illumination of the object. A range of models, including battery operated ones. Ideal for viewing maps, directories, botanical and geographical specimens when ambient light is not adequate. Useful for close work.

vi. *Paperweight Magnifier*: is a moulded plastic lens. Clear plastic allows light through to copy.

vii. *Super Loupe*: handy 2X magnifying lens hangs from neck cord and rests against chest, leaving hands free to do hand work.

viii. *Eye Loupe*: A favourite with watch makers and jewellers. Using precision acrylic lens the unit is very light and can be held comfortably in eye sockets. It is also available with adapter for use with spectacles. It can be put on and taken off easily.

ix. *Head Loupe*: Mounted on a comfortable handband it can be flipped up when not in use. As both eyes are used this magnifier provides 3D vision enabling fine manual coordination. The lenses have built-in prisms that eliminate squinting and eyestrain. It can

be worn over spectacles also. It is best suited for any kind of detail work where both hands are required to be free to attend to his work.

x. *Flashlight Magnifier*: ivory light hood rests on printed material keeping focal distance steady.

xi. *Fresnel Wallet Magnifier*: Slim extremely light weight and visiting card size, it fits easily into pocket or purse. A ready at hand magnifier for reading fine print in dictionaries, menu cards, instructions or medicine bottles, etc.

xii.*Pocket Magnifier*: A general purpose magnifier commonly used as an inspection tool and a reading aid. It is easy to hold and can be used to read a sign or a bus number.

xiii. *Rayner Recumbent Spectacles*: has a single prism mounted on a sturdy black plastic frame which requires little adjustment.

xiv. *Superscan Reading Glasses*: can be worn over ordinary spectacles

xv. *Windsor Spherical Magnifiers*: a range of hand-held magnifiers available in 50, 76 and 102 mm lens diameter giving 3.0, 2.0 and 1.8 magnification.

xvi. *Stand Magnifier*: Handy table top magnifier, ideal for magnifying printed matter, films, artworks, maps etc. Rests on work surface and leaves both hands free. The stand has side openings allowing illumination and easy accessibility of tools to the object being viewed (Lensel Product Catalogue)

xv. *Hand Held Magnifiers*: Commonly used general purpose magnifiers. These have precision lenses made of optic grade acrylic. The lenses are break resistance and much lighter than equivalent glass lenses, hence more convenient to use.

Manufacturer : Lensel Optics Pvt. Ltd.,
66/2, D2, MIDC, Chinchwad,
Pune - 411019
Phone : (020) 774581, 774340, 779460, Fax: 770212
E-mail : lensel@pn2.vsnl.net.in

5.5 Overhead Projector: is supplied with screen, stand, lamp and transparency sheets with magnification facilities.

6. Psychological and Learning Aptitude Tests

6.1 Psychological Tests : The psychological assessment and training programme is an integrated process designed to develop each individual person's skill potentials as much as possible. The administration of these tests is yet not very common in India. The assessment for employment potential is generally based on his level of performance in each skill, his rate of skill acquisition and his performance reliability.

Note: These tests were standardized in the U.S.A., new reliability and validity norms must be established locally.

The complete training exercise battery comprises of five psychomotor tests. These have been selected for inclusion on the basis that each will assess and train a different aspect of five manipulation and hand-finger dexterity:

a. Minnesota Rate of Manipulation Test
Skill Objective: arm-hand dexterity

b. Pennsylvania Bi-manual Work Sample
Skill Objective: Finger dexterity, gross movement ability and bimanual co-ordination

c. Purdue Pegboard
Skill Objective: manipulative dexterity as required in performance of assembling, packing, simple machine operations and routine manual jobs.

d. Crawford Small Parts Dexterity Test
Skill Objective: dexterity in handling and assembling small parts.

e. Stanford-Kolhs Block Design Test for the Blind
Skill Objective: fine tactile discrimination.

Note: For administration and scoring of these tests, kindly refer to Manual for A Motor-skills training programme for industrial placement of visually impared workers.

f. The Blind Learning Aptitude Test (by: Ernest Newland)

This individual test has items in bas-relief form, consisting of dots and lines. The test taps the psychological operations by means of which learning takes place by sampling six different kinds of behaviours.

The Test is being used in more than a dozen countries other than United States of America. Shukla (1987) established that as learning aptitude affects scholastic achievements, the Blind Learning Aptitude Test can be used as a tool for predicting performance in schools in India. He also established that the rural students have better learning aptitude that their urban counterparts. Similarly, urban students exhibit more behavioral disorders in class-rooms situations than rural students.

The Science & Technology Mission for the Persons with Disabilities has funded the following projects in the area of visual impairment:

1. Universal graphical and Braille classroom communication system

2. Developemnt of Braille micrometer

3. Development of text reading system with voice output for Indian languages

4. Development of electronics guide stick for the visually impaired

5. Evaluation of mobility devices for the visually impaired

6. Improving the productivity and safety in manufacturing situation

7. Development of interpoint Braille writing frame

8. Development of standard white cane for the rural blind

9. Fabrication of magnifiers for persons with low vision

10. Development of computer operated speech synthesizer

11. Viewing aids for children with low vision

For details, please contact :

> **Science & Technology Mission for the Persons with Disabilities**
> 4, Vishnu Digamber Marg,
> New Delhi - 110 002.

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CHAPTER VIII

EDUCATION OF THE
VISUALLY IMPAIRED

"Education must aim at giving the blind child a knowledge of the realities around him, the confidence to cope with these realities, and the feeling that he is recognized and accepted as an individual in his own right." -   Berthold Lowenfeld

1. What is Education

1.1 Special Education : UNESCO (1983) has provided the most comprehensive and appropriate definition of special education.

"Special education is a form of education provided for those who are not achieving, or are not likely to achieve through ordinary educational provisions, the level of educational, social and other attainments appropriate to their age, and which has the aim of furthering their progress towards these levels". It includes integrated as well as residential school education.

Gideon, John and others (1992) also consider special education as instruction that is designed to meet the needs of children who cannot profit from the regular curriculum. Carter's Dictionary of Education as reported by Bernardino (1963) defines special education as:

"The education of the pupils who deviate so from the relatively homogeneous group of so-called `normal' pupils that the standard curriculum needs, involves modification of the standard curriculum in content, method of instruction, and expected rate of progress to provide optimum educational opportunities for such people".

Jangira (1986), however, defines special education as the process of making educational provisions to meet special educational

needs of children which can not be met by the arrangements available in ordinary education. By implication, both education of the talented and education of the disabled come within the purview of special education. Johnson (1994) disputes this contention and advocates that the "traditional term" special education is proposed to describe education of students with disabilities carried out entirely in an outside, parallel school system.

To explain Special Education, Stein (1990) prefers the Greek term "Pedagogy" which means *"Take a child by the hand and lead him into life"*. The greatest challenge is to lead children out of school and prepare them for life.

According to UNESCO (1983) Pedagogy is the systematic set of rules, or science involved in special education. The French term *"Pedagogie Speciale"*; Spanish term *"Pedagogia Especial"*; and Russian term *"Pedagogika Special'naja"* cover all branches of the science of education dealing with the upbringing and education of atypical children (UNESCO, 1983).

Pedagogy, thus covers all branches of education of the children with all categories of disabilities and includes special as well as integrated education.

1.2 Residential School

According to Frampton & Kerney (1953), residential school for the visually impaired may be defined as:

"A boarding school offering education and care to blind children from ages three to twenty-one, or from pre-school through the high school. Educationally speaking, these schools attempt to provide complete education and care for the blind children. These services include medical, academic, musical, social, vocational courses, placement, and follow-up."

Tutle (1986) also confirms that the oldest, the most comprehensive and the most expensive delivery model is the residential school. It provides basic array of services:

- Instructional services including classroom, educational materials and equipment, offices and storage, teachers, aides and other specialists;
- Food services including fully equipped kitchen, dining room, cooks, and other personnel;
- Residential services including furnished rooms, linen, laundry, house-parents, and other personnel;
- Extracurricular and recreational services, both on the campus and the community;
- Health-care services including clinic and medical staff;
- Maintenance and administrative services.

The entire campus of the residential school is designed, equipped and staffed specifically to meet the needs of the visually impaired children. In addition to the classroom teachers, there may be other specialists in physical education, orientation & mobility, activities of daily living, music, craft teaching, occupational therapy, career counselling, vocational counselling, social work and psychology. The educational materials, educational and mobility devices and specialized equipment are accessible to all the students throughout the campus.

Gideon, John and others (1992) have defined residential school as:

"A school in which the pupils are provided dormitory accommodation and live apart from normal family environment other than holidays and weekends."

Generally, a residential school avails grant-in-aid from the State Department of Social Welfare or such other department. It avails and mobilizes public support as donations, endowments, sponsorship of meals or special events. The residential schools are symbols of public charity, pity and compassion for the visually impaired children. Most schools are managed by public

charitable organizations and supported by the State Departments of Social Welfare.

According to Lowenfeld (1983), however, the residential school for the blind has undergone a decisive change in character. It is no longer an institution which children enter with the expectation that they will remain there until graduation, returning to the "regular world" only for vacation. It no longer harbors groups of youngsters which remain, by and large, unchanged for many years until their members are scattered into a world from which they have for a long time been apart. The school for the blind no longer is an organization that has practically no contact with the stream of life in the general public school system of the state. It is a part of the stream into which it channels the pupils who have become adjusted, and from which it receives those who need special training or temporary adjustment.

Frampton (1953) emphasize that the residential school has outlasted many social, educational, and economic changes and survives today rigorous and alert to its task. It will remain a bulwark for the future, insuring to the visually impaired the most productive and practical method of teaching.

1.3 Integrated Education

It refers to the measures taken to provide educational resources, within the ordinary educational system, for those children who need them, the aim of integration is to avoid or reduce restrictions on any aspects of a child's development which might result from segregated education. To Kristiansen (1989) to be integrated means to be transferred from a segregated or isolated position to an ordinary environment, with the rights and obligations that are linked to it.

According to Namgayel (1985) integrated education refers to meaningful involvement of such youngsters into ongoing regular educational programme to whatever extent it is feasible and beneficial, in a given instance, with the ultimate goal being optimal academic and social as well as personal learning of each child.

According to Mani integrated education means providing equal educational opportunities and experiences to children with disabilities with the assistance of a trained specialist teacher in the least restrictive environment such as a regular school.

Integration is also referred to as day school, common school, ordinary school, regular school, normal school, standard school movement.

1.4 Inclusive Education

As adopted in the Salmanca Framework for Action, Article 7, the fundamental principle of the inclusive school is that all children should learn together, wherever possible, regardless of any difficulties or differences that they may have. Inclusive school must recognize and respond to the diverse needs of their students, accommodating both different styles and rates of learning and ensuring quality education to all through appropriate curricula, organizational arrangements, teaching strategies, resource use and partnership with committees. There should be a continuum of support and services to match the continuum of special needs encountered in every school.

Johnson (1994) provides most comprehensive definition of inclusive education:

"It is a flexible and individualized support system for children and young people with special educational needs (because of a disability or for other reasons). It forms an integral component of the overall education system, and is provided in regular schools committed to an appropriate education for all."

Johnson (1994) lists the following distinguishing features of inclusive education:

a. It preferably takes place in a regular class, in the student's nearest, regular school.

b. Separation from the regular class environment, whether partially or in exceptional cases fully, occurs only where there is evidence that education in a regular class, accompanied by supplementary support and services, fails to meet educational, emotional and social needs of such students.

c. It recognizes, and responds to, the diversity of children's needs and abilities, including differences in their ways and paces of learning.

d. It encourages use of individualized teaching methods, adapted curricula and teaching devices.

e. It is a team work of the whole school with class teacher provided with the following support services plays the major role:

- Supply of special teaching aids and material.
- Availability of assistance by parents, volunteers or older students.
- Modification or adaptation of physical environment, curriculum, time table and evaluation procedure as per specific needs of the child.
- Provision of inservice training to upgrade knowledge and skills of the class teacher.
- Appropriate services of guidance and counselling.

Johnson (1994) concludes that *"with careful planning, it should be possible to meet the unique needs of all students within one unified system of education - a system that recognizes and accommodates for differences."*

The following words of Benget Lindqvist, United Nations Special Rapporteur on Disability amply clarify the concept of inclusive education (UNESCO, 1998).

"It is not our education systems that have a right to certain types of children. It is the school system of a country that must be adjusted to meet the needs of all children".

1.5 Significant Difference

Education *per se* is generally defined on the basis of aims or objectives, while special education is defined on the basis of the educant and the mechanics or arrangement for his education. Special education has the same objective as general education. There is improvement in the method, mode and system of imparting instructions as per the specific needs of the select target group.

All modes of education - residential, integrated and inclusive have the same goal of formal education of the disadvantaged groups. They, however, differ in the means of achieving the same. The residential education focuses at attainment of education through special schools, whereas integrated education aims at providing education to disadvantaged children within the ordinary educational system.

Mainstreaming in the United States, Integration in the United Kingdom and India, Normalization in Scandinavian countries, though differing in conceptual and operational nuances, have the common denominator of educating children with special needs, as far as possible, in ordinary schools (Jangira, 1986).

2. Status of Education of the Visually Impaired in India

2.1 Acceptancein the Constitution

The basic structure of the Constitution of India as reflected in the Preamble ensures social, economic and political justice as well as equality of status and of opportunity to all citizens of India. It is thus constitutional obligation of the State to ensure equal justice and equality to all citizens including persons

with disabilities and other marginalized groups of people.

Similarly, the Directive Principles of State Policy embody the aims and objects of the State under the republican Constitution e.g. that it is a Welfare State. In other words, it shall strive to promote welfare of the people by securing and protecting as effectively as it may a social order in which social, economic and political justice shall inform all the institutions of normal life

The State policy regarding right to work in case of disablement is enshrined in the Directive Principle under Section 41 of the Constitution of India. It states that the State shall, within the limits of its economic capacity and development, make effective provision for securing the right to work, to education and to public assistance in cases of unemployment, old age, sickness and disablement, and in other cases of undeserved wants.

As regard education, Article 45 of the Constitution of India on the Directive Principles of State Policy states *"the State to provide free and compulsory education for all children until they complete the age of fourteen years."* The Persons with Disabilities Act, 1995 goes a step further and desires provision of free education to children with disabilities till the age of 18 years. Thus the Constitution of India has duly recognized provision of education to all children including those with disabilities.

Despite the spirit of social justice and equality as embodied in the Constitution, a negligible percentage of such persons has access to required services. Even after so many years of independence, hardly 5 percent visually impaired children of school age have been enrolled for education. While the country is at the verge of declaring education as a fundamental right, education of the visually impaired is still considered a welfare activity.

2.2 National Policy on Education (1986)

For the first time, the policy considered *"Education for all"* as one of the cherished goals of national development. Universalization of primary education is a step towards realization of this goal. The policy recognizes that non-enrollment and drop-out of special groups of children is one of the major difficulties in the realization of this goal. One of the special groups, which has received inadequate attention so far, is that of children with disabilities.

Outlining the steps for ensuring equal educational opportunities for the children with disabilities, the National Policy on Education states that the objective should be:

"to integrate the physically and mentally handicapped with the general community as equal partners, to prepare them for normal growth and to enable them to face life with courage and confidence."

Itenvisages that *"wherever it is feasible, the education of children with motor handicaps and other mild handicaps will be common with that of others."*

2.3 The Plan of Action (1986)

The Plan of Action also stresses that as education of children with disabilities in special schools is very costly, it will be ensured that only those children whose needs can not be met in common schools be enrolled in special schools. Once they acquire communication skills and study skills, they will be integrated in common schools.

2.4 The Bahrul Islam Committee on Legislation for Persons with Disabilities (1988)

The committee included education in the Draft Legislation. It mentioned that the State shall endeavour to provide free and universal elementary education to children with physical and mental disabilities. renThe State shall also provide assistance

to them for education and training at the secondary and higher levels. It also emphasized promotion of integrated education and continuation of residential education.

2.5 Central Scheme of Integrated Education for the Disabled Children (Revised 1987,1989 and 1992)

With the emergence of the National Policy for Children (1974) which envisages coverage of children with disabilities as well, the Ministry of Social Justice & Empowerment introduces this scheme. It was a centrally sponsored scheme with 50 percent financial support to State Governments by the Ministry for this purpose. The scheme was liberalized during April, 1981 providing for 100 percent financial support to State Governments in addition to other facilities such as setting up of an assessment room, resource room, and special pay to special teachers etc.

With the coverage of education of children with disabilities in the National Policy on Education during 1986, the scheme was shifted to the Ministry of Human Resource Development.

The scheme purports to provide educational opportunities for children with disabilities in common schools. A large number of State Governments have already adopted the Scheme. They have established Administrative Cells for monitoring the Scheme. However, coverage of visually impaired children under the scheme at present is negligible.

In light of successful experience of Project on Integrated Education of Disabled (PIED), the scheme was revised further during 1992 to give an opportunity to the NGOs to implement the scheme.

2.6 Project Integrated Education for the Disabled (PIED)

The National Council for Educational Research and Training implemented PIED during 1987 with the financial support from UNICEF in order to strengthen implementation of IEDC within the framework and goals of the National Policy on Education. UNICEF provided support for development of instructional material, training of personnel, mobilizing community support, training of parents and coordination o the project in remote and rural areas and difficult places. It also extended support for identification and assessment of children with disabilities, establishment of resource rooms, provision of aids and appliances and allowances for children with disabilities. The approach adopted under PIED was Composite Area Approach and different models were adopted to experiment this approach.

2.7 Evaluation of IEDC

The NCERT evaluated the IEDC in 14 States during 1989-90. The study established that IEDC is not being implemented properly due to lack of trained manpower and lack of coordination regarding the scheme (Azad, 1996). The States/UTs are facing problems in its implementation mainly due to lack of orientation, late receipt of grants from State/Central Governments and lack of coordination among different agencies associated with its implementation (Azad, 1996).

Gujarat, however, has taken a quantum jump in the implementation of IEDC. The coverage of children with disabilities was enhanced to 15,800 during 1999. The Gujarat Council for Educational Research & Training (GCERT), State Coordination Committeeu under the schme has already identified 33,000 children with disabilities which need to be covered under the scheme.

2.8 Department of Special Education

The National Council for Educational Research & Training (NCERT), a premier institute run under the auspices of the Ministry of Human Resources Development has established the Department of Special Education for promoting education of persons with disabilities. The Department has been playing a key role in the promotion of integrated education, implementation of UNICEF sponsored project on integrated education, teacher training and the implementation of District Primary Education Programme.

2.9 Persons with Disabilities Act (1995)

To give effect to the Proclamation on the Full Participation and Equality of the People with Disabilities in the Asian and Pacific Region, the Parliament enacted the Persons with Disabilities Act (Equal Opportunities, Protection of Right and Full Participation) Act, 1995 which came into force with effect from 7th February, 1996.

The Act desires the appropriate Governments and local authorities to ensure that every child with a disability has access to free education in an appropriate environment till he attains the age of eighteen years. It encourages promotion of integrated, residential education, functional literacy, non-formal education, education through open school or open universities. It desires initiation of research for designing and developing new assistive devices and developing human resources.

It also ensures reservation of at least three percent seats in the educational institutes for persons with disabilities. It also encourages preparation of comprehensive education schemes with a variety of facilities for such persons.

2.10 District Primary Education Programme

Evolving from the national experience with area-specific projects is an ambitious nation-wide plan, popularly known as District Primary Education Programme (DPEP), to put local communities in charge of education in their area and enhance investments in primary education. The DPEP attempts to little less than a complete overhaul of the system of educational planning in the country and to implement interventions in primary education in a holistic and coordinated fashion. It is being implemented in the mission mode through registered autonomous societies in each state. As a first step, a five year plan for the selected districts has been chalked out. The district planning process, however, is distinct in its emphasis on participation by all major actors in the education system, such as parents, guardians, teachers, educational administration and voluntary organizations.

From the year 1995, the education of children with disabilities has also been included as integral component of the programme. All such children in the selected districts would be enrolled for inclusive education at the primary level. The DPEP envisages following measures in this regard:

- Providing all children, including children with disabilities, with access to primary education either in the formal system or through non-formal education programme.
- Facilitating access for disadvantaged groups such as girls, socially backward communities and children with disabilities.
- Improving effectiveness of education through training of teachers, improvement of learning materials and upgrading of infrastructure facilities.
- Short training of selected primary teachers as regard imparting education to children with disabilities.
- Appointment of special teachers at district and cluster level for providing support services to class teachers.
- Provision of assistive devices and educational devices to these children.
- Involvement of experts in disability development in the State Co-ordination Committee.
- Orientation of Master Trainers at the State and District level in respect of educational needs of children with disabilities.
- Improving the quality of education through a process of demand creation for better services.

DPEP is an excellent and bold step towards promotion of inclusive education of children with disabilities.

2.9 International Opinion

Azad (1996) presents a summary of various Commissions, Declarations and Policies on Education which lay emphasis on making education accessible to each and every citizen including children with disabilities. Some of these statements are as follows:

- Everyone (including child with disability) has right to education (Universal Declaration for Human Rights, 1948).
- The education of children with disabilities should be inseparable part of the general education system (Indian Education Commission, 1964-66)
- Every effort should be made to develop integrated programmes enabling the children with disabilities to study in regular schools (National Policy on Education, 1967)
- The child with disability will enjoy all the rights enjoyed by everyone else (U.N. General Assembly Declaration on the Rights of Persons with Disabilities, 1975)
- Every effort should be made for wider expansion of education for children with disabilities (National Policy on Education, 1979).
- Special assistive devices and equipment should be provided for children with all categories of disabilities for their placement in regular schools (Working Group Report on Education of Children with Disabilities, May, 1980).
- Every individual regardless of individual differences has a right to education (World Conference on Education for All, 1990)
- A child with disability, who can be educated in regular schools, should be educated there only (National Policy on Education, 1992)

- Education of persons with disabilities is an integral part of the education system (UN Standard Rules with Equalization of Opportunities for Persons with Disabilities, 1993).
- Provision of Education to children with special educational needs within the regular education system (Salamanca Declaration, 1994).
- All the pre-primary and primary schools should be strerghened in tems of trained manpower and facilities to enroll children with disabilities (Rights of Children with Disabilities, NIPCCD, 1999)
- Enable by year 2002 at least 75 percent of all children and adults with disabilities to participate in formal and non-formal education programmes on an equal basis with non-disabled peers (Asia Pacific Decade of Persons with Disabilities).

3. Milestones in the Development of Education of the Visually Impaired

3.1 ResidentialSchools

Stein traces the beginning of the education of the visually impaired to a letter written by Diderot during 1748 and published in a newspaper in Paris as *"Letter about the blind for the use of those who can see"*. Dr. Diderot, a physician by profession had two visually impaired friends who influenced his thinking.

It was only during 1784, that Mr. Valentin Huay established the first school for the visually impaired in Paris. Mr. Louis Braille, a student of this school later on went and invented the embossed six dot system of reading and writing, now popularly known as Braille.

Frampton (1953), however, maintains that in the United States, groups of visually impaired children were first taught in a residential school on 15 March, 1832 and in a public school (integrated education) on 17 September, 1900

3.2 Residential Education in India

1887: Soon the good news travelled abroad. Miss Annie Sharp, a missionary, founded the first school for the visually impaired in India at Amritsar. It was shifted to Dehradun during 1903, now called the Sharp Memorial School for the Blind after its founder.

Mr. Bihari Shah started Calcutta School for the Blind.

1889: An institution for the visually impaired run by the Canadian Presbyterian Mission established at Indore.

1890: Ms. A. K. Askwith established the Palayamkottai School for the Blind

1893: Ms. O'Connor founded a class for the visually impaired at Ranchi

1896: The Canadian Presbyterian Mission started a class for the visually impaired at Ujjain.

1900: Mukti Mission established a Home for the Blind at Kodgaon, Poona. Ms. Millard founded the American Mission School for the Blind which was subsequently renamed as the Dadar School for the Blind.

190:: Mr. M.M. Srinivas established the School for the Deaf and the Blind at Mysore.

1902: The Victoria Memorial School for the Blind established in Mumbai.

1915: The Baroda State founded the Mehsana School for the Blind.

1917: N.S.D. Industrial Home for the Blind established in Mumbai.

1919: The Blind Relief Association founded in Mumbai which established centres at Chalisgaon, Valsad and Surat.

1922: Mr. B. N. Mitter founded Patna School for the Blind.

1925: Happy Home for the Blind founded in Mumbai. Mr. Sahabzada Aftab Ahmed Khan founded Ahmadi School for the Blind at Aligarh.

1929: Madras Association for the Blind founded. Dr. Kugelberg founded Tirpattur School for the Blind.

1932: K. K. School and Home for the Blind founded at Bhavnagar.

1934: Mr. V. H. Telang founded Poona School and Industrial Home for the Blind.

1939: Govt. School for the Deaf and the Blind established at Hydrabad.

1940: Dr. Mary Scott started Kalimpong School for the Blind.

1941: Mr. Subhodh Chandra Ray founded All India Lighthouse for the Blind at Calcutta.

1943: St. Dunstan of London established the St. Dunstan's Hostel for Indian War Blinded at Dehradun. (The venue now accommodates the National Institute for the Visually Handicapped).

1944: Sir Clutha Mackenzie submitted *"Report on Blindness in India."* The Blind Relief Association established in New Delhi.

1945: The Navrangpura School for the Blind established at Ahmedabad.

1949: Model School for the Blind established at Dehradun.

1950: Jagdish Patel established Blind People's Association at Ahmedabad.

1951: The National Association for the Blind established in Mumbai.

1957: Blind Boys Academy established at Narendrapur, West Bengal.

1958: Divine Light School for the Blind established at Whitefield, Bangalore.

1960: A School for the Blind established at Bhubneshwar.

1962: Andhra Blind Mission School established at Nasrapur.

1963: Bharat Blind School established at Shahadara, Delhi.

1969: Shree Ramna Maharishi Academy for the Blind established at Bangalore.

1981: A large number of schools for the visually impaired established across the country as a part of observation of the International Year of Disabled Persons.

1995: The Persons with Disabilities Act, 1995 envisages promotion of all modes of education including residential education.

1998: The Scheme of Assistance for the Promotion of Voluntary Education also supports establishment of special schools for visually impaired children with multiple disabilities.

2000: There are 300 schools for the visually impaired across the country covering 20,000 visually impaired children. This coverage is merely 3 percent of the population of the school-age visually impaired children in the country.

3.3 Beginning of Integrated Education

Three groups of individuals played an important role in initiating integrated education:

i.   *Blind Persons themselves*: Many visually impaired persons themselves were not satisfied with special education. They took the initiative in encouraging integrated education.

This is true in India as well. Most of the initiators of integrated education like Jagdish Patel, Lal Advani, Ramnik Halari, Rehmat Fazelbhoy, Bhaskar Mehta, Narinder Kumar, Harshad Jani, Anil Patel, Ashir

Nallathambi, M. K. Chaudhary, A. S. Athalekar, Harshad Joshi are visually impaired persons.

ii.   *Progressive Teachers of visually impaired*: They discovered that the special education was not the right answer to education and complete development of the visually impaired. Hence they initiated integrated education.

iii.   *Parents of the Visually Impaired Children*: also realized that their visually impaired children must be educated along with the sighted children and they encouraged integrated education.

3.4 Milestone in the Development of Integrated Education Abroad

The Scottish Education Act, 1872 made provision for the education of the visually impaired along with seeing children in the Public Board Schools. In 1879,the London School Board decided to carry out integrated education thoroughly and systematically.

Chauhan (1989) traces the origin of integrated education to Johann Witheim Klein, founder of the Imperial School for the Blind who mooted this concept in the early nineteenth century. He prepared a handbook to guide normal teachers in their educational ventures for the visually impaired. Samuel Gridley Howe (1871) voiced strong objections to *"social sequestration"* and advocated having the visually impaired *"attend the common schools in all cases where it is feasible."* He considered special education unnatural and supported integrated education.

Madden and Slavin (1983), however, attribute the growth of mainstreaming in the USA to the Education for All Handicapped Children Act of 1975, mandating the *"least restrictive placement"* of children with disabilities. This means that many students who were formerly taught in self-contained special education

programmes were to spend as much time as possible in the regular programmes, with only as much special instructions outside the regular class as absolutely necessary.

According to Lady Campbell (1921), *"Blind children were placed with the seeing in Edinburgh in 1834-36, but lack of interest caused the plan to be given up. The first successful effort to place children in day school classes was made in Greenock, Scotland in 1868 only"*. Gallagher (1982) feels that the signs of mainstreaming visually impaired children began to emerge during 1950 accompanied by a proliferation in the number of rehabilitation and adjustment training centres.

3.5 Beginning of Integrated Education in India

Ras Mohun Halder, Principal of the Dadar School for the Blind and pioneer in the field of the education of the visually impaired in India refers to integrated education in the regular school system in his 1943 publication *"The Visually Handicapped in India."* He suggested establishing of a special class, in collaboration and co-ordination with a central sighted school, where these partially sighted children (not totally blind) children can congregate in a separate room provided with special equipment and under supervision of a properly qualified teacher. The children could, with advantage, attend almost all the regular classes with the normally sighted children.

3.5.1 Bombay Experiment: Halder (1943) reported that the first experiment of this nature was started in 1940 by the Dadar School for the Blind in cooperation with the Hume High School, Bombay. Two bright pupils after finishing their elementary education in the blind school were sent to regular schools. One boy stood first in all his examinations in a class of 40 sighted children.

Halder (1943) reported that this experiment was started out of a local need and through economic necessity. Till then there was, however, no reported case of any visually impaired child living in his parental home and attending a sighted school anywhere in India.

3.5.2 Joint Venture: According to Chauhan (1989), the first attempt in implementation of integrated education in India was made during 1960 by the Ministry of Education and the Royal Commonwealth Society for the Blind. This venture could not make much progress. Mrs. Rehmat Fazelbhoy, a pioneer of integrated education in India, launched integrated education during June, 1958 with the admission of two visually impaired students in the New Activity School, Mumbai. Taylor and Taylor (1970) also confirm this and report that during April, 1967 seven visually impaired children were enrolled here.

3.5.3 The Palanpur Experiment: on partial integration emerged in 1963. Starting with 4 visually impaired boys, it has grown steadily, and now has more than 100 such boys and girls. One finds reference to the needs of providing special education in the Education Commission Report (1964-66) which recommends placement of children with disabilities, as far as possible in ordinary schools.

3.5.4 The Visnagar Project: on the Itinerant Model of integration of the rural visually impaired children was initiated during 1981 with 11 children only. During 1990, there were 232 children enrolled in the regular rural schools. The movement has spread to other areas of Gujarat as well and enrollment more than 2000 children by 1999. Integrated education has been accepted as a component of the comprehensive community based rehabilitation of the rural visually impaired.

3.5.5 The Central Scheme of Integrated Education for the Disabled: was evolved by the Ministry of Social Justice & Empowerment during 1974. The Scheme has since been revised during 1987 in view of the National Policy of Education (1986).

3.5.6 Ramakrishna Mission Vidyalaya, Coimbatore: established a major personnel preparation programme for promoting integrated education.

4. Residential Schools

As explained earlier, under this system of education, the visually impaired children are provided residential accommodation, meals and clothes and they attend special schools. Most of these schools follow the regular academic curriculum. The students are also imparted training in various crafts, orientation & mobility and activities of daily living.

4.1 Advantages of Residential Schools

- Availability of specialized trained teachers
- Access to a wide range of special equipment
- As the size of each class is small, generally limited to 10 students it is possible to pay individual attention to each student
- Teacher has adequate time for each student
- Excellent system for the poor children as boarding and lodging is generally free.
- Well organized and clean environment
- A shelter for abandoned or abused visually impaired children
- Excellent facilities for the development of other skills i.e. music, chair caning, weaving etc.
- Adequate emphasis on plus curriculum i.e. Braille, activities of daily living and orientation and mobility

4.2 Limitations of the Residential System of Education

4.2.1 Low Coverage: Of the 51 countries that supplied information for a recent study by UNESCO (1988), 34 - most are developing countries - have less than 1 per cent of their total population enrolled in special education provisions, with 0.03 per cent

at the lower end of the range.

In line with this, WHO estimates that institution based services which are the predominant form of service delivery, cater to nearly 1-2 per cent of rehabilitation needs in developing countries (UNESCO, 1988). Other estimates have indicated that possibly less than 1 per cent of disabled children in these countries receive any educational assistance (Brohier, 1990)

4.2.2 High Cost: The residential services tend to be very costly due to the following factors:

- large expenditure on buildings, equipment, infrastructure, and establishment
- large per student expenditure on the specialist staff as the teacher-student ratio is as low as 1:5
- pupils need to be provided boarding and lodging facilities and other amenities
- there is hardly any financial contribution from the family

The trend in India is that such residential schools should provide completely free boarding and lodging facilities. The residential schools are run not as educational institutes but as charitable institutes.

4.2.3 Restricted Growth: As the students at such schools are labelled as "special" it makes it difficult for them to ever re-enter the mainstream.

Ahuja (1980) also supports this contention and maintains that the students coming out of the residential schools are totally unprepared for life. They are unfit for employment in the open market and their emotional growth and development of personality too are limited. Shukla (1990) admits that the students who pass out of these institutions also develop rigid attitudes and do not appreciate 'give and take'.

4.2.4 Isolation of the Inmates: Stein (1990) goes to the extent of comparing residential schools with Ghettos i.e. completely isolating the visually impaired from the society. People recognize the need for special education but do not want to be a part of it. The approach is comparable to creating special rooms for the sick and dying. Under the pretext of doing something for the ailing, the society created special rooms and thus isolated them totally. The same logic could be true for the creation of special schools.

4.2.5 Creating a Separate Group: The residential schools, however, for the first time in history raised hopes for the visually impaired, hope for their liberation from mediocrity and hope for a better life. These schools, however, contributed to the phenomenon of "the visually impaired - a group set apart" These schools could cater to the needs of only a fraction of the visually impaired population, and lacked genuine rehabilitation concepts and provision for the reintegration of the visually impaired into the community.

4.2.6 Resulting to Aggressive Behaviour: Mathur (1985) after conducting a in-depth study on social aggression of a visually impaired inmate of a residential education and training programme concluded that since the subject was socially deprived of love, affection and economic support (Mayor, 1981), from his family, he gradually developed the tendency of hostility, which later on was manifested in aggressive behaviour. The factors which play a significant role in socialization and fostering kinship being absent in a residential school and coupled with social isolation, turned him to an aggressive individual. This study concludes with the observation that integration of the subject would save him from developing hostility and aggressive behaviour.

4.2.7 Inadequate Services: Jangira (1989) refers to the absence of adequate early intervention, parental participation and pre-school education programmes in such schools. There is also a conspicuous absence of programmes for meeting the educational needs of visually impaired children with other disabilities like mental retardation and hearing impairment. There is also a lack of instructional material for improving access of visually impaired children to appropriate curricula to ensure equal educational opportunities. These areas of concern, as pointed out by Jangira are true for integrated education in the present context.

In the field of education as a whole, Jangira (1989) lists two more areas of concern i.e. isolation of special schools and the tendency of such organizations to consider similar organizations as competitive organizations; moreover most of these voluntary organizations confine their activities to a single disability.

4.2.8 Poor Quality: Saxsena (1982) is also very critical of the quality of education in the residential schools. The increase in the number of such schools has not been accompanied by a corresponding increase in qualitative excellence in the standard of education. The residential schools function as islands and are woefully ill-equipped to fulfill the expected role. Similarly Gallagher (1983) is not certain as to the potential role and impact of technology on residential schools.

4.2.9 Kenmore (1972) identified three major limitations of the residential education:

i.   It has been assumed in all countries that what was done in special schools was the best possible. Today it is known from many graduates of some of these schools, that there have been many things not good there.

ii.   A second assumption about special schools was that teachers gained special understanding and knowledge about visually impaired. This is not necessarily true. Often older teachers passed on to younger teachers poor ways of teaching various subjects, incorrect information about blindness, and peculiar attitudes

which hampered each succeeding generation of visually impaired children.

iii.   A third assumption was that it was a kindness to visually impaired children to shelter them from the world of the sighted while they were young and to prolong their childhood as long as possible. Special schools around the world often kept visually impaired people in school until they were well into their thirties. The students of these schools thus always remained diffident and dependent.

Kenmore (1972) concluded that integrated education can help correct those old problems of special schools, can contribute to their improvement, for integration must be tied to special schools. As one type of programme flourishes, the other will also.

5. Integrated Education

5.1 Advantages of Integrated Education

According to Stein, integrated education for the developing countries is not a matter of option but a compulsion. According to Kenmore (1985) this system is more than an alternative; it is quite literally the only hope, for thousands of visually impaired children in developing countries, for any education.

According to Jangira (1985) most of the developing countries visualize integrated education as an expedient measure to reinforce efforts to improve access to school as a part of the universalization of basic education. International funding agencies UNESCO and UNICEF also support it as an alternative to the education of children with special needs in special schools.

A large number of educators and workers of the visually impaired have pointed out the following advantages of integrated education.

5.1.1 Low Cost: Expenditure on integrated education is comparatively lower as:

- there is no investment in building;
- no maintenance of hostels;
- no duplicating of land areas, play ground and equipment.

Advani (1990) maintains that integrated education in the Indian context is not as cost effective as is considered. If expenditure on resource room, material, salary of teachers and other incidental expenses are considered, the cost difference between residential schools and integrated education programmes would not be significantly large.

5.1.2 Integration: The integrated education enhances the social acceptance of a child due to the following factors:

- The child has the advantage of being in an environment which he shares with his sighted peers.
- Congenial company instead of isolation - a natural social environment.
- Participation in the general community life.
- Stays with his family thus ensuring family bonding.

Jangira (1991) while investigating sociometric choices relating to the academic, managerial and play related tasks and academic performances of visually impaired children in general schools found that these children are neither isolated nor below average in academic performance.

5.1.3 Family Involvement: The visually impaired children under integrated education also have their full share of family life along with their family members It forces the family to feel and assume its responsibility towards the child. It also enables the child to feel that he is an integral part of the family.

Gardiner (1908), however, felt the other way. Sometimes the loving mother was the child's worst enemy, and unless the child was rescued in time from such a "good home" there would be a lot of hard work for teachers that might be avoided if the child came to school before the home-spoiling process had gone too far.

5.1.4 Better Understanding of the Sighted: Under integrated education, a sighted child obtains a better understanding of a visually impaired student , his needs, his aspirations and the true picture of a disability, it helps to reinforce that a disability need not bar a student from attaining academic excellence. It enables sighted students to appreciate the problems and feelings of the visually impaired and to learn proper ways of dealing with them.

5.1.5 Better Acceptance: According to Rehmat Fazelbhoy many misconceptions are destroyed when there is a close contact between visually impaired and the sighted children, and foundations are laid for the acceptance of the former into the world after graduation.

5.1.6 Demonstration: According to Han Zole, Head of Beijing Municipal Corporation Bureau (Shui, 1981), having disabled children in common schools is a positive factor. The courage and confidence shown by them in overcoming their difficulties is an object lesson to normal students in the cultivation of good character and it has had a unifying influence among the schoolmates. Similarly, Bailun Xu (1990) maintains that in China there has often been reduction in the drop out of sighted students in some schools as a result of encouragement from visually impaired students who had been integrated into the programme.

5.1.7 Familiar Environment: According to Horton (1988) transferring of knowledge is less of a problem in an integrated programme because the child is being trained in his home area. He also adds that as the parents watch the child being trained by the teacher, they would be able to form a more realistic picture of what the child is able to do on his own.

5.1.8 Community Participation: Pickering and Haskell (1986) advocate that central to the argument for integrating disabled children in regular schools is the belief that they are members of the community and have the right to grow and develop inside that community. In Australia, the parents are pressing for 'Rights Legislation' encompassing the right of every child to be educated in a regular school; non-categorization of disability; and no child to be denied schooling on the basis of claimed ineducability.

5.1.9 Right of a Child: Thus integrated education is not being viewed merely as an option but as a right of every disabled child. Stein (1981) supports this contention and maintains that any society's ethical, moral and spiritual value can be measured according to not only whether or not it tolerated its members with disabilities, but whether it fully accepts them. One of our philosophers said the people with disabilities need society, but society needs its members with disabilities also. The Persons with Disabilities Act, 1995 also recognizes child's right to appropriate education.

5.1.10 Conclusion: On the basis of these observations, one may conclude beyond doubt that integrated education is the only viable available alternative for promoting universal education of the visually impaired in the developing countries. It scores better on the following accounts:

- social integration
- quality of vocational training
- cost effectiveness
- personality development
- coverage
- understanding of the sighted, etc.

According to Bourgeault (1970) integrated education is logical, practical, viable, educationally sound and can be accomplished at a minimum cost. According to Bailun (1990) integrated education is more a matter of necessity than a luxury.

5.2 Limitations of Integrated Education

5.2.1 Low Enrollment: This system has been prevalent in India since 1956. The progress is dismal in the following aspects:

- enrollment
- number of common schools admitting such children
- quality of training, and
- availability ofeducational material.

During 1990, only 3,000 (Advani, 1990) visually impaired children have been enrolled under integrated education.

5.2.2 Declining Enrollment: Findings of Dixit (1985) are very alarming. He established that the percentage of schools providing integrated education has declined from 83.72 percent during 1972 to only 50 percent during 1982. The reason for this drastic decline is attributed to the fact that initially the schools tried the new concept but were considerably discouraged for many reasons.

Dixit also established the phenomenal increase in the average number of pupils per residential school from 50.4 to 69.04 during the same period (increase is significant with t=2.26). During the same period, number of pupils per teacher also increased from 5.6 to 6.8 (increase is significant with t=1.9). The study also establishes that the residential schools have upgraded the level of education they impart. Average number of trained teachers also increased from 3.03 to 7.51 which is a significant increase (t=4.72).

Frampton (1953) after analyzing the enrollment in the residential schools and in common schools in the United States over 75 years concluded, "It is interesting to note that, percentage-wise, the number of visually impaired children enrolled in the residential schools for the visually impaired has not appreciably changed since the beginning of day school movement over the last 50 years".

5.2.3 Apathy of Parents: Mittal (1981) is of the opinion that in India where parental attitudes towards the visually impaired child are found to be mostly negative and where social prejudice is presently too strongly embedded to allow free and equal participation in the activities of the community and common school, the success and efficacy of integrated education needs to be objectively assessed.

5.2.4 Not Suitable for All Children: Fazelbhoy (1959), a crusader of integrated education, also admits that every visually impaired child, however, can not be educated in common schools. It can not be denied that learning with sighted children imposes a certain amount of strain on visually impaired child, there are times when the child finds himself on the sidelines, unable to participate in certain activities.

Ramakrishna Mission Vidyalaya (1989) reported that about 10 percent of identified disabled children are either over aged or below the school going age. In order to streamline these unserved children, the residential schools have been endorsed the responsibility of bringing them up by providing necessary pre-school training so that they can be inducted into integrated education.

5.2.5 Difficult to Implement in Urban Areas: Fazelbhoy (1990) points out that getting visually impaired child accepted in urban schools proves more difficult than rural schools. As most of residential schools are located in urban areas, the concerned authorities do not see the need for admitting a visually impaired child into a common school. The Third Asian Conference (1968), however, noted that the introduction of integrated education in rural areas may face some difficulties.

5.2.6 Cropp (1985) recognized that a fully integrated setting presented potentially major constraints for all pupils with visual impairment. He conceptualized these constraints in terms of time, equipment, staffing and physical environment. He recognized the following curriculum constraints in this respect:

a. Teaching of specific skills of orientation, mobility and braille results into missing of activities undertaken by his seeing peers.

b. A mainstream school can not normally offer access to the type of equipment available in a special school.

c. Quality of equipment and educational material is restricted.

d. The class teacher can not be expected to have knowledge of specialist inputs. Similarly the specialist teacher may lack familiarity with mainstream curricula and approaches.

e. Many a times, school environment is unsuitable to meet the special needs e.g. lighting etc.

f. There is an age-range dilemma in terms of effects of placing older visually impaired pupils with younger pupils.

Integrated education even after 100 years of its implementation world over and 50 years of its implementation in India, has not succeeded in reaching even one-tenth of population of school-age visually impaired children in the developing countries. Integrated education by no means has emerged as penance for the promotion of appropriate education of the visually impaired.

6. Models of Integrated Education

Over the years, a variety of models of integrated education have been successfully developed in various countries. Most of these models are a combination of hostel facilities and complete integration. In India, almost all the models listed below have been tried at various locations. The most popular models in India are the Itinerant Model and the Resource Centre Model of integrated education. All the models have their own merits as well as demerits. The Itinerant Model of integrated education is, however, the most suitable for India.

6.1 Model I Semi - Special Schools

The visually impaired children are enrolled in the special schools. They are provided residential accommodation in the special schools itself. They attend some classes in the regular schools in the vicinity and they return to the residential schools after the same.
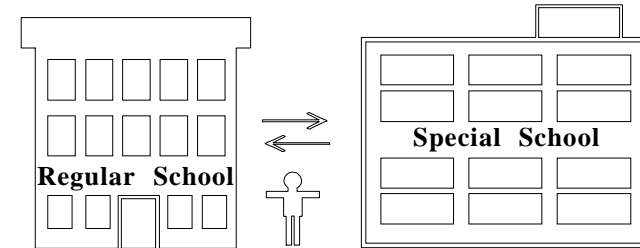
Demerits: As students return to the residential school, after attending some lectures at the regular school, they tend to isolate themselves. This model does not result into meaningful integration.

6.2 Model 2: Resource Centres Model

In this model, the visually impaired children are provided residential accommodation and resource room facilities near a standard school. They, however, attend the standard school in the locality.

They daily go from their resource centre to the standard school and come back after the classes are over. The Resource Centre has facilities for producing braille material and has educational aids and appliances for the visually impaired students.

6.2.1 Acceptance in India: This model is also explained as the residential annexe attached to a standard school. In India, this model is also termed as Semi-integrated Education. Most of the integrated education programmes supported by the Christoffel Blindenmission in Tamil Nadu have adopted this model. Most of the city based integrated education programmes generally follow this model.

Standerd School   Recource Centre
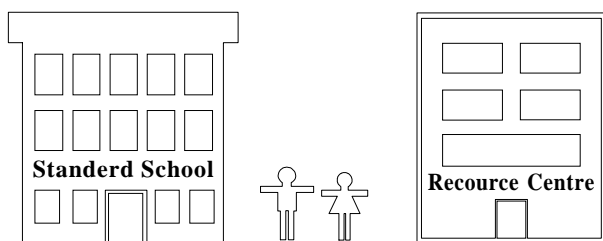
6.2.2 Merits: As services of the Resource Teacher are available full time at the same location, the quality of support services and plus curriculum is better.

This model is feasible when there are at least four to eight students in a single school. This model is suitable for urban areas where a leading educational institute takes up the responsibility of implementation of integrated education.

6.2.3 Limitations: This model, however, is not feasible where the population of visually impaired children is scattered and it is not practically possible or feasible to enroll the required minimum number in one school.

According to Horton (1988), a Resource Room is feasible if there are four or more blind or low vision children attending

the same school. Otherwise, it is neither economically feasible nor good use of a special teacher's time to set up a resource room.

6.2.4 Demerits: The Resource Centres tend to become special schools as more and more visually impaired children are identified or enrolled. The advantage of low initial investment, cost effectiveness, active community involvement and complete integration which are the principal objectives of integrated education are not fulfilled in this model. For countries with resource constraints and large numbers of visually impaired children, this model is thus not desirable.

6.3 Model 3. Itinerant Model of Integrated Education

The visually impaired children stay with their families in their own communities only. They are enrolled in a regular school in the vicinity. They are provided services of an Itinerant Teacher and the education instructional material and equipment. The visually impaired students accompany other sighted students to the nearby school and return to their homes, like other children, after school hours.

6.3.1 Mobile Teacher: The Itinerant Teacher travels from village to village to provide special instruction and support services in the regular school or at the homes of the children. The number of times the Itinerant Teacher visits the school depends on the needs of the children. It could vary from one visit a week to as many as five visits a week (Horton, 1988). The difference in this model is in the movement of the teacher rather than the movement of the children (Bourgeault, 1970)

6.3.2 Teacher - Student Ratio: This ratio in this plan as approved under the Central Scheme of Integrated Education of Disabled Children is 1:8. Stein (1990), however, feels that this ratio should not exceed 1:6 if adequate attention is to be paid to each child. The actual ratio, at present, in the existing itinerant

programmes is 1:12 mainly due to the low number of trained teachers and scarcity of resources.

Horton (1988) mentions about a Teacher Consultant programme in which the Itinerant Teacher travels from school to school but meets and guides the class teacher and not the visually impaired student. This model is similar to the Itinerant Model but is as yet not prevalent in India.
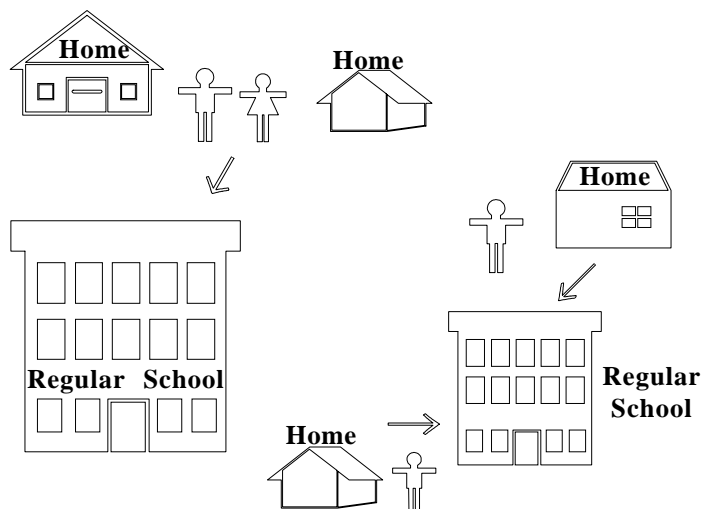
6.3.3 Merits: The Itinerant model described above is the most effective model of complete and true integrated education. It is the only alternative for the children staying in the rural areas where regular schools exist. This model involves the family actively in the education of the children. This model has been adopted by all the projects initiated and encouraged by the Sight Savers and the National Association for the Blind. As this is the most appropriate model, it needs to be discussed in greater detail:

6.3.4 Role of Itinerant Teacher: The teacher is expected to perform the following roles:

- Mobility and Braille Teacher
- Instructor in Activities of Daily Living
- Teacher Consultant to the Class Teacher
- Arrange admission of the visually impaired students
- As an Investigator for identifying the visually impaired children in the assigned area
- Promoter of the idea of integrated education and complete integration of visually impaired children
- An Artisan as he is expected to train visually impaired children in various local trades and crafts
- Career Counsellor to the students completing school education
- Counsellor to the parents and the fellow students

6.3.5 Selection of Visually Impaired Children: Mr. Stein is of the opinion that the Itinerant Teacher should cover at the most 7 visually impaired children at any point of time. (The Central Scheme of Integrated Education of the Disabled Children recommends Teacher - Student ratio of 1:8)

The Teacher - Student ratio in case of the project areas of the participating teacher is 1:12. In such cases where it is essential to maintain such a ratio due to financial constraints and other such reasons, the following procedure is recommended:

- Visit all the visually impaired children to be covered (12 in the present case).
- Administer a pre-planned questionnaire for evaluating the child in mental as well as social aspects
- Select 3 best children and initiate integration. Three best children may be selected on the basis

of the following criteria:

i. Level of orientation & mobility
ii. Language development

- Speaking ability
- Understanding ability

For establishing this, ask simple questions:
* names of family members
* name of the village
* routine activities
* name of items of daily use, etc.

iii. Ability of the child to identify the world around
iv. Level of sensory development, etc.

- Arrange for the admission of the selected 3 best children and start pre-braille activities
- Take the next 3 visually impaired students when these 3 are reasonably well settled.

During the first year, major emphasis should be socialization of the visually impaired children. Academic development should not be the only target.

- While children in groups 1 and 2 are being covered, the Itinerant Teacher should pay regular visits to other children at home to teach them initial skills.
- The visually impaired children who are well settled in the regular schools should be used as a demonstration to others.

6.3.6 Stages for Preparing a Child for School: After the 3 best children have been identified, the following steps should be followed before the child is admitted into the regular school:

6.3.6.1 The first step should be sensory training i.e. activating the remaining senses of hearing, touch, taste and smell etc. As far as possible simple techniques and locally available material should be used for this purpose.

6.3.6.2 Pre - Braille training: the next stage is imparting pre-braille training. Mr. Stein emphasizes that teaching of alphabets straight away must be avoided. Various Montessory aids should be introduced at this stage. The aim of this exercise should be to sensitize the tactile sense of the child and familiarize it with the concept of an embossed and tactual script like Braille.

6.3.6.3 The pre-braille training should culminate into the teaching of braille. Mr. Stein advocates a scientific approach to teaching of braille. He makes the following observations:

- Reading of braille should be the first step.
- Beginning should be made with recognition of dots.
- Writing of braille should be the last stage.

It is advisable to administer work sheets as suggested by Kirk Horton in his UNESCO publication on education of the visually impaired.

6.3.7 Introduction to School: It is desirable to follow the following steps:

6.3.7.1 Orientation about the class room and the school - the Itinerant Teacher should take the visually impaired child to the school one day in advance and orient him about the class room, toilet, staff room, prayer hall, place for drinking water and other facilities at the school.

6.3.7.2 The Itinerant Teacher should approach the Principal and explain to him the whole approach to integrated education. Otherwise the Principal may have doubts about the success of the programme.

6.3.7.3 The Itinerant Teacher should contact the class teacher alone. He should explain the programme to him and his role in the programme. The class teacher in turn may introduce the visually impaired child to other students in the class. The Itinerant Teacher should leave his address with the class teacher.

6.3.7.4 The Itinerant Teacher should encourage pairing of the visually impaired child with a sighted child who could help the former while going to the toilet, in group activities to facilitate the participation of the former child.

6.3.7.5 The Itinerant Teacher should also explain to the class teacher the special equipment which the visually impaired child uses. He should also explain the contents of the Braille Kit and the use thereof.

6.3.8 Working with the Visually Impaired Child: The Itinerant Teacher should perform the following roles:

a.   Mobility Training: He should provide appropriate

and adequate training in mobility to the child to enable his independent movement in the school.

b.   He should orient the child about the environment around his school. The following four locations must be explained to the child:

- class room
- toilet
- water tap
- play ground

c.   He should introduce the child with the Principal and the class teacher.

d.   Build up a good rapport with the child before initiating any formal education. The first lesson must definitely not be an arithmetic lesson!

e.   He should maintain a daily diary of the inputs given to each child and a log book depicting his travelling.

f.   He must not dominate the class teacher, he should realize that both roles are complementary.

g.   The frequency of visits of the teacher would depend upon the individual needs of the child. The frequency of visit should be more in the beginning and it may be reduced subsequently which would however depend upon progress of the child.

6.3.9 Integrated Education Process: A publication of the NAB Rural Activities Committee *"Guidelines for Social and Economic Rehabilitation of the Rural Blind"* has reported an Integrated Education Process which is reproduced below with certain modifications. This process is relevant and advisable for the itinerant mode of integrated education.

Activity	Person Responsible	Purpose
1. Identification of V.I. children (3-12 years age)	• Field Workers • Itinerant Teachers	• For admission in the regular school
2. Counselling the parent and the V.I. child	• Field Worker • Itinerant Teacher • Project Supervisor	• Convincing the V.I. child to join the school • Motivating parents to send the child to the school • Popularizing integrated education of VI children
3. Preparing the Child • Orientation & mobility	• Itinerant Teacher	• To enable the child to move around freely
• Daily Living skills	- do -	• To enable the child to take care of himself
• Braille Reading	- do -	• Introduction of Braille
• Braille Writing	- do -	• Access to material in braille
4. Admission to the village school	• Itinerant Teacher • Joint Project Director	• Education of VI child • Social integration • To popularize the concept and feasibility of such education

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Activity	Person Responsible	Purpose
5. Involvement of class teacher and school staff	• School Headmaster • Education Officer • Resource/Itinerant Teacher • Class Teacher • School Headmaster	• To demonstrate the skills of V.I. children • To create public awareness • Social integration • Assistance in reading and school work • Participation in education, sports. and extra-curricular activities • Assistance in commuting and other daily living activities
6. Incentive to class teachers	• School Headmaster	• Active involvement of teacher Better attention and extra coaching • Adopting of special techniques by the class teacher for facilitating understanding of VI child

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	● Project Director	● Cooperation of school management, teacher and fellowstudents.
7. Service Flow	● Resource/Itinerant Teacher	● Extra coaching of VI child
	● Class Teacher	● Morale boosting
		● Active involvement of parents, teachers and fellow students
	● Headmaster	● On the spot solving of the inherent problems
	● Project Director	● Encouraging use of educational aids and material
8. Evaluation	● Headmaster ● Project Director	● Performance evaluation of the child and the programme

6.4 Model 4: Preparatory Schools

This mode of education is also becoming popular in the developing countries. In this model, visually impaired children are provided one or two years of preparatory services at a central place. This place may be a day centre or a residential centre. At the centre, the children are imparted training in skill development, pre-braille braille, orientation & mobility, activities of daily living and socialization. After this training, they are enrolled into regular schools. They may be covered under the Resource Model or Itinerant Model of education.

This model is a combination of the residential as well as regular school education. The beginning is made with special instructions with the objective of promoting integrated education.

This model as reported by Punongong (1990) has been adopted in Thailand. The children come to the education centre from their rural homes and stay for approximately one year in the hostel. First they are taught basic living skills, such as personal hygiene , independence in daily living skills, getting around with and without a cane, and trust in others. After acquiring these skills, the children enter the preparatory programme, held at a centralized place or the child's home attended by the Itinerant Teacher. They learn to read braille, use abacus and stylus. Then they are enrolled into a regular school under the Itinerant Mode of Integrated Education.

6.5 Model 5: SPED Centres

According to Gregorio (1981) the most effective access route in the Philippines today that enables the school - age visually impaired children to benefit from services and education in the *"least restrictive manner"* is the Special Education Centre, popularly known as the SPED Centre.

The physical dimension of a SPED Centre may be anywhere from an unused classroom in a common school, a shared space in the library, or a school clinic, to a corner in a hallway or even an area underneath the stairways of the school.

The SPED Centre makes available to the school age visually impaired child a variety of educational services ranging from resource room instruction and partial integration for some, full integration in regular classes and special classes for the visually impaired whose multiple disabilities may prevent him from getting the most out of education along with sighted peers.

The distance of the home of each child becomes the determinant of the specific programme plan for him. For the visually impaired

child who resides far away from SPED Centre, itinerant teaching is adopted while resource room services are provided to students who live near the Centre.

The SPED Centre provides the following services:

- Survey, location, screening and assessment and referral services for prospective pupils.
- Selection of an appropriate programme plan viz. integration, partial integration, resource services in specific class etc.
- Provision of suitable requirements according to the specific type of disabling condition.

The operational capacity of the SPED Centre depends upon a number of local factors. In the Philippines, it has been demonstrated that the special education teacher can assume the leadership in setting up school-age pupils in regular schools which would certainly increase their chance for full participation in life.

The SPED Centre Model is combination of all the five models mentioned earlier as it takes care of all models of education of the visually impaired. This model is individual need-based and in consonance with the local conditions and the environment of the child.

7. Which System is Better

The educators, professionals, administrators and workers in the field of education of the visually impaired have discussed, argued and debated this question for over more than one century. The question has still not been answered. Inclusive as well as integrated education have been the only subject of discussion at several world meetings.

The professionals have very strongly advocated that inclusive education is the least cost, whereas integrated education low cost; both socially desirable and the only viable solutions of educating millions of visually impaired children. Some of them have gone to the extent that inclusive education is not an option but a compulsion, particularly for the developing countries. Hence, there is no question of comparison among different systems of education. The philosophical basis of inclusion and integration emanating from the normalization principle, labelling and equal opportunities principle is supported by reports of successful integration practices (Thomas, 1985)

Yet the residential schools have not only continued to provide education but have grown in number, have more enrollment and have improved the quality of education. It is only in this century that a large number of inclusive and integrated education programmes have developed, and now this system is operating in over 30 countries with Government support (Kenmore, 1985).

In India, all these systems are prevalent and being promoted. The State Governments are providing grants for the maintenance of special schools and hostels, whereas financial assistance for promoting integrated education is available under the Central Scheme of Assistance for Integrated Education of Disabled Children (Revised 1992). The nation-wide District Primary Education Programme aims at promoting inclusive education at the primary level across the country. The Persons with Disabilities Act (1995) envisages promotion of all the models of education. The National Policy on Education (1992) has emphasized the need for encouraging integrated education. At the same time, it has recognized supporting special education for children with specific problems and multiply disabilities.

From the available literature on residential, integrated and inclusive education and various research studies, it is difficult to clearly establish:

- Which system is better than the other?
- Within a particular system which particular model of education should be promoted?

- What is the possibility of adopting a middle path approach and what should be the level of inclusion, integration and residential support?
- Need for transition from one model to another and time span and criteria for the same?
- Need for evolving various criteria of establishing efficacy and evaluating performance of a particular system and testing reliability of that criteria.

Oliphant (1912) evaluated the integrated education, contrasting it with the residential school. He concluded, *"As to the educational environment, - for purposes of acquiring knowledge and modes of making livelihood, I think special education has the advantage, -for purposes of learning the art of living, I think integrated education has the advantage"*.

Tobin (1972), however, indicated that the integration/segregation debate centres upon beliefs, hopes, and long-term aims, and depends not so much upon empirically determined facts as upon *"a value judgment concerning the role the child is to assume later in relation to seeing persons"*

8. Middle Path Approach

Both systems of integrated and residential education and combinations thereof have stood the test of time and they are bound to stay. Inclusive education goes a step further in promoting education in a completely non-restrictive environment. The experience in Gujarat has established that with the promotion of integrated education, the enrollment in the residential schools has increased. The children who cannot be accommodated in the regular schools due to age, multiple disabilities, lack of availability of secondary level education in the vicinity and other such factors seek admission in the residential schools. The enrollment under inclusive education is also steadily rising.

Similarly, a number of residential schools are also performing the role of a resource centre, material production centres and preparatory centres. The residential schools have also initiated teacher training courses for the itinerant teachers and class teachers under inclusive education. Many leading educationists of the visually impaired who have been promoting residential education are now promoting inclusive as well as integrated education also.

In India and other developing countries, all these systems of education are relevant and desirable. All these systems with their combinations should be promoted. It is, however, essential that the criterion for selection of the system of education should be based on the convenience of the child and his felt needs. The middle path approach has been advocated by a large number of experts across the world. The following statements of the most leading educationists across the world support this contention:

8.1 Target Oriented Approach

8.1.1 Segmentation According to Level of Disability: Van Cleve (1916) remarked in this respect, *"I am coming to the conclusion that the provision for the visually impaired in integrated education may better be confined to partially sighted who may be placed in conservation of vision classes (integrated education) and leave to the specially organized and equipped institutional schools the work with the totally or partially blind"*.

8.1.2 Segmentation According to the Level of Education: Namgayel (1985) stresses that integrated education should be adopted from the ninth standard onward. It is important that visually impaired students should develop some self confidence. They should get basic feelings of education or schooling before they are integrated into the regular schools. Whereas the Asian Conference (1968) recommended introduction of integrated education at all levels.

8.1.3 Segmentation According to Availability of Services: The Ohio report (1950) concludes that *"special classes in the public schools"* would be best for the majority of visually impaired children but that the residential school should be maintained

for them where such classes do not exist or where these children could not be educated. Cheah (1963) also supports this contention.

8.2 Need for Co-ordination

Lowenfeld (1946) desired co-ordination between residential schools and common schools. According to him the school for the visually impaired no longer is an organization that has practically no contact with the stream of life in the general public school system of the State. It is a part of that stream into which it channels the pupils who have become adjusted, and from which it receives those who need special training or temporary adjustment. These views were incorporated into "Oragon Plan'.

W. R. Dry (1948) reviewed the Oragon Plan after it had been in operation almost for five years. His five conclusions were:

  i.   It is not only possible, but entirely feasible to correlate the work of the residential school and the public schools.
  ii.   Such a programme is not inimical to the interest of children without sight or those with low vision.
  iii. There must be cooperation between all agencies interested in the health, welfare and education of the visually impaired children.
  iv.   Such programmes will, in all probability, achieve the following ends:

    a. Increase enrollment in the residential schools.
    b. Help by locating visually impaired children sooner and so ensuring maximum in physical restoration, and educational and emotional adjustment at an early date.
    c. Decrease the time the children are required to spend at the residential school.
    d. Enable the facilities of the residential school

to serve a much greater number of visually impaired children, so eventually decrease the number of such children.

  v.   If such a programme is to be possible, administrators and staff of the residential schools for the visually impaired must broaden their horizons to include not only the visually impaired child with extremely low vision, but every child who has any visual impairment.

8.3 ComplementaryRoles

Bourgeault (1968) also supports this contention and maintains that integration is not a substitute for a quality residential programme but, rather, a complementary service. The residential school role is a significant one, but without a doubt, a changing one, and much must be done to strengthen their staff and to modify their curricula so that the over-aged beginner and the multi-impaired can be better served than in the past. He concludes, *"No programme in any state, region or nation is complete without both residential and integrated educational opportunities."*

8.4 Education According to the Felt-needs of theChildren

The Perkins School for the Blind proposed "The English Plan" in 1952. The Plan proposed:

  ● formation of council;
  ● placement of a number of pupils in public schools;
  ● establishing of braille classes;
  ● providing of educational material and equipment;
  ● co-operating with the State departments in determining the most suitable programmes for an individual child, either in residential school or elsewhere;
  ● and transferring him from one type of schooling to another as circumstances may direct.

The Plan advocated the philosophy that the educational programme should be fitted to the child, and not the child to the programme. The points to be considered in this context are: physical, mental and emotional maturity, eye condition, family status and the school facilities in his home town. In each case each child is treated as an individual case, and the answer is found on the basis of, what seems best for the child, not personal bias of one group or another.

Thomas (1985) concludes that our guiding principle must be to find the educational environment of those available to us, that best meets the needs of the child rather than to choose the most convenient integrated setting.

Azad (1996) also advocates that the education now is to be tailored according to the needs of the child. The child is not to be compelled to fit in the system without appropriate adaptations. The main concern of the educationists should be to provide conducive environment to children with disabilities in a manner that inspite of their limitations, they experience success and improve their quality of life.

8.5 Integrated Approach

Jangira (1986) also proposes a service delivery mode which takes into consideration the strengths of both the modes to generate an "eclectic mode" which elevates it from a mere `mix level' to the organismic integration of the two modes. Namgayel (1985) also supports this contention and advocates that the special school should work as a base school. It should provide reading material and required equipment.

Bourgeault (1970) also advocates that the emphasis should be placed on the needs of visually impaired children for special instructions and for independence rather than on administrative convenience.

The Third Asian Conference on Work for the Blind while recognizing the importance of integrated education, accepted the value and role of special schools and recommended their development. The conference accepted the fact that integrated education was not the only means of providing education and observed that, where other alternatives existed, each child should be placed in a suitable programme after proper screening.

8.6 International Initiatives in Support of Inclusive Education

Inclusive education has evolved as a movement to challenge exclusionary policies and practices and has gained ground over the past decade to become a favoured adopted approach in addressing the learning needs of all students in regular schools and classrooms. International initiatives from the United Nations, UNESCO, the World Bank and elsewhere jointly add up to a growing consensus that all children have the right to be educated together, regardless of their disability or learning difficulty, and that inclusion makes good educational and social sense (UNESCO, 1998).

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The Persons with Disabilities Act, 1995 makes the following provisions as regard education,

Section 26 : The appropriate Governments and the local authorities shall-
(a) ensure that every child with a disability has access to free education in an appropriate environment till he attains the age of eighteen years;
(b) endeavour to promote the integration of students with disabilities in the normal schools;
(c) promote setting up of special schools in the Government and private sector for those in need of special education, in such a manner that children with disabilities living in any part of the country have access to such schools;
(d) endeavour to equip the special schools for children with disabilities vocational training facilities.

Section 27 : The appropriate Governments and the local authorities shall by notification make schemes for-
(a) conducting part-time classes in respect of children with disabilities who having completed education up to class fifth and could not continue their studies on a whole-time basis;
(b) conducting special part-time classes for providing functional literacy for children in the age group of sixteen and above;
(c) imparting non-formal education by utilizing the available manpower in rural areas after giving them appropriate orientation;
(d) imparting education through open schools or open universities;
(e) conducting class and discussions through interactive electronic or other media;
(f) providing every child with disability free of cost special books and equipments needed for his education.

EMPLOYMENT AND PLACEMENT OF THE VISUALLY IMPAIRED

1. Importance

There is a general consensus the world over that employment is the most essential but the toughest aspect of rehabilitation. Employment of the visually impaired is a more potent problem in India due to:

- higher incidence of visual impairment;
- near non-existence of social security benefits;
- higher prevalence of visual impairment in the working age group;
- limited education and training facilities;
- majority of them are illiterate, confined to their homes,
- high rates of unemployment and rampant under-employment.

Most visually impaired persons and their families come from the poorest rungs of society. In fact, studies have revealed a very high correlation between poverty and disability. The cost of maintaining such persons in the family adds to the financial burden. Thus their economic rehabilitation does not remain an individual need; many a times it becomes a question of survival of the family.

1.1 Employment Process

It has been observed that a vicious cycle of the following components is an obstacle to the employment process:

- Absence of identification services

- Lack of job-oriented training facilities
- Irrelevant training
- Lack of training of employment officers
- Lack of an implementing machinery and absence of a system of delivery of services
- Ignorance of employers
- Apathy of employers and Government officials.

To expedite the employment process, it is essential to:

- direct all efforts at breaking the vicious cycle at some stage;
- extend appropriate job-oriented training and career counselling facilities;
- prepare a person for suitable employment;
- convince the employers to extend him employment;
- counsel family members and community in this regard; and
- involve Government machinery actively in the process.

1.2 Explanation of the term "Employment"

It is essential to expatiate the term 'employment' which has different connotations for different people. Employment *per se* does not mean formal, secured or regular employment only. It also means:

- any trade, economic activity or profession;
- in the organized as well as unorganized sector;
- any trade that would provide with some monetary remuneration.

The term employment used by rehabilitation planners generally ignores a vital aspect that the community itself offers a wide spectrum of opportunities where visually impaired persons may be absorbed in gainful occupations. Rehabilitating a 50 year old lady in a remote village in India, for example, means helping her to take care of her household activities as she used to perform prior to her visual impairment or more importantly to perform the same tasks that the sighted women perform. Majority of women in rural areas are expected to perform the following activities:

- Cook meals for the family
- Perform household activities
- Take care of children and the elderly
- Fetch water
- Undertake rural occupations or the family trade

Thus they enable the other family members to undertake income generating activities and in the process they contribute indirectly towards family earning. This is what is meant by gainful occupation and thus economic rehabilitation.

Work is essential for every human being, not only for the sake of money and for economic independence, but also because it contributes to self esteem and self dignity leading to an abiding joy for life. For persons with disabilities, it is still more important as the self esteem and financial gains generated out of it would offset to a great extent the negative impact of disdainful attitude of the society. (Pandey & Advani, 1995)

1.3 Explanation of the term "Economic Rehabilitation"

Economic rehabilitation aims at developing and enhancing the functional abilities of a person with disabilities so that he/she is gainfully occupied resulting in economic contribution to self and the family. In fact, economic rehabilitation is the principal objective of the existing approach to CBR - a concept initiated and promoted by Rural Activities Committee of the National Association for the Blind all over the country. Economic rehabilitation includes any trade, economic activity or profession which enables an individual to make any tangible or intangible

contribution; any monetary or non-monetary service support to the family or community in the organized as well as unorganized sector.

1.4 Income Generation

The income generation activities on the other hand are a sub-set of economic rehabilitation and these mean direct monetary or tangible gains derived on a regular basis for services rendered or goods provided. Vocational training should generally lead to promotion of income generation or many a times economic rehabilitation. In general parlance, vocational training aims at promoting open employment of the individual. It refers to skill development through a structured and formal training programme which aims at placement of a person in open competitive wage employment in the organized sector.

1.5 Vocational Rehabilitation

Vocational rehabilitation is an outcome of the employment process. It may be achieved through open, self or sheltered employment, gainful occupation or income generation.

ILO Recommendation No. 99, Paragraph 1 (a) reads:

"For the purpose of this recommendation the term 'vocational rehabilitation' means that part of the continuous and coordinated process of rehabilitation which involves the provision of those vocational services e.g. vocational guidance, vocational training and selective placement, designed to enable a disabled person to secure and retain suitable employment"

2. Production Potentials

A visually impaired person is generally considered:

- unproductive and lacking in production skills; and
- a burden on the society.

Remaining idle and unemployed are probably the major causes for the resultant isolation, depression and rejection in him. It has been established that a visually impaired person can perform competitively in various professional, semi-professional and industrial jobs; rural crafts, trades and agricultural operations. It has been observed that when incentives for work motivation and recognition of high performance are available, his performance is comparable to that of a normal person provided that the job does not require visual discrimination or the same has been compensated for.

3. Avenues of Employment

3.1 Unorganized Sector

    3.1.1 Self Employment
    3.1.2 Professional Employment
    3.1.3 Home-workers
    3.1.4 Cooperatives
    3.1.5 Community Based Rehabilitation

3.2 Organized Sector

    3.2.1 Open Employment
    3.2.2 Special Employment
            3.2.2.1 Sheltered Workshops
            3.2.2.2 Transitory Employment Workshops
            3.2.2.3 On-the-job Training Centres

3.1 Unorganized Sector

In India, the employment opportunities for visually impaired persons in the organized sector, particularly in the rural areas are almost non-existent. This employment crisis, both for the visually impaired as well as the sighted, has resulted due to exclusive dependence on the organized sector which accounts for only a small proportion of the work-force. The unorganized sector which is the major avenue of employment for the sighted,

may prove to be the most appropriate avenue of employment for the visually impaired also, if suitably exploited through:

- a coordinated approach;
- need based training, and
- an effective system of delivery of services.

3.1.1 Self Employment

a. *Definition*: The term self employment generally implies self initiated, developed and regulated income generating opportunities where the individual plays the role of the investor, employer and employee.

Self employment as a petty shop owner

b. *Importance*

- Vast employment potential
- Could be carried out with the active involvement of the family members who could play a complimentary role to each other
- Requires low investment resulting in speedy returns

- Availability of bank loans, subsidy and financial incentives
- Training can be availed in the house or the village itself.

c. *Factors Responsible for Success*

- Business acumen, foresight and knowledge of occupation
- Capacity and willingness to work
- Understanding environment and the individual needs
- Availability of training facilities
- Compatibility between training facilities and the specific requirements of the venture
- Level of support from the family and community
- Existence of an organizational net-work
- Availability of a launching grant
- Coverage of the occupation under the existing schemes
- Prevalence of occupation in the area
- Financial viability of the venture

d. *Illustration*

- Physiotherapy and massage
- Computer programming and operation
- Marketing, salesmanship and trading
- Petty shop keeping, vending stall
- Music
- Courier services
- Insurance agency
- Touch typing, stenography
- Public call office-telephone operating
- Internet and E-mail

- Plastic moulding, motor rewinding, furniture repairing, chair caning
- Bicycle repairing and hiring out
- Travel agency

3.1.2 Professional Employment

Definition: Professional employment refers to open employment or self placement of qualified and trained individuals in various professions

a. *Importance*

- Ideal avenue for educated persons
- Higher social status
- Easy social acceptance
- Higher earning
- Appropriate use of skills
- Better chances for formal placement and self-employment
- Easy career growth

b. *Factors Responsible for Success*

- Initiative and hard work
- Good mobility, suitable orientation
- Acquiring of specific skills through higher education and appropriate training
- Availability of appropriate assistive devices, adaptations and techniques
- Involvement and coordination of research, industrial training and higher education institutes and universities in the process
- Support from the National Handicapped Finance and Development Corporation
- Recognition of courses by accredited agencies
- Governmental, administrative and institutional support.
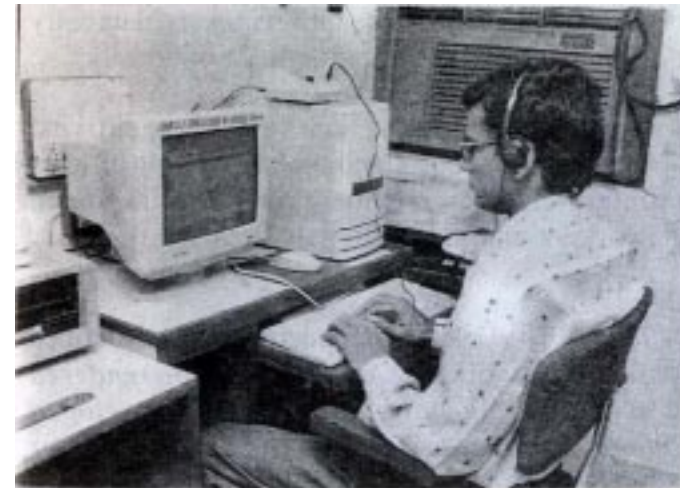
Computer operator

Operating Braille Embosser

c. *Illustrations*

- teachers, music teachers, vocational instructors
- masseurs, physiotherapists

- stenographers, computer programmers, data entry personnel, internet and E-mail operators
- lawyers, solicitors
- business managers, marketing executives, management consultants, public relation officers
- interpreters, employment interviewers, social workers and psychologists

3.1.3 Home Workers :

a. *Definition*: The Helen Keller International has defined industrial home work as *"A service to be rendered by an accredited agency - designed and developed with the intention of adhering to health and labour laws - to offer regular work training and remunerative work opportunities to those eligible disabled persons who cannot for physical, psychological or geographical reasons leave their homes to travel to and from a place of business"*.

b. *Essential Features*: According to the ILO publication *"Employment of Disabled Persons - Manual on Selective Placement"* some essential features of a good home workers programme are:

- adequate transport facilities for the supply of raw material and collection of finished products;
- availability of raw material;
- availability of training facilities;
- effective sales organization;
- sufficient supervisory staff to visit the stake holders at their homes;
- variety of suitable work to suit skills and aptitude of workers;
- support of family members and community.
- prevalence of occupation, production activity or craft in the area;
- adequate remuneration for the work.

Caning of chairs

c. *Some other features may be added*

- Financial viability
- Professional approach
- Availing of following benefits:
  * bulk buying
  * low cost of investment
  * financial assistance for initial training
  * incentives, subsidy, low-interest rate loan from the Government
- Identification of occupation specially for the visually impaired
- Legislative support to the activity
- Institutional and administrative support to the activity.

d. *Importance*: Home-work is the most important avenue of economic rehabilitation for the visually impaired who are home-bound due to:

- nature of their disability,
- age,
- lack of mobility,
- physical incapacity,
- social constraints, particularly in case of women.
- lack of education or specific production skills

e. *Limitations*: In a module initiated and implemented at the Blind People's Association, Ahmedabad for the training and employment of persons with disabilities of all categories in domicilliary occupations as home workers, the following problems have been identified:

- Limited choice of products
- Scattered target group
- 83 percent visually impaired persons are above the age of 45, hence lack of motivation amongst them
- Non-availability of space at home for carrying out production activity
- Lack of uniformity of quality of finished products
- High cost of material distribution
- Lack of availability of any Government assistance and no coverage of such schemes under the Central Scheme of Assistance to Voluntary Organizations
- Pilferage of finished products
- Damage to products in transit

3.1.4 Cooperatives

a. *Definition*: The ILO publication *"Vocational Rehabilitation and Employment of the Disabled : A Glossary"* defines cooperatives of the disabled as an association of the disabled which aims to promote their vocational and social rehabilitation by their gainful employment in a common enterprise run on co-operative self management lines within the frame-work of the national economic plan, and also to engage in social and educational activities for the purpose of:

- preserving and enhancing physical efficiency;
- restoring them to social activity;
- enabling them to earn a living;
- satisfying the social needs, and
- improving standards of living.

b. *Important Features*

- Unity of ownership
- Forming a self controlled organization
- Voluntarily joining together to achieve a common end
- Similarity in production activities
- Proximity of work place
- Bulk buying and bulk selling
- Making equitable contribution to the capital required
- Accepting a fair share of risks and benefits
- Statutory recognition to the duly constituted cooperatives
- Availability of incentives, credit and other facilities.

c. *Limitations*: In India, cooperatives of the sighted have generally succeeded in credit, consumers, housing, dairy, irrigation, agriculture and allied pursuits only. The cooperatives in the industrial sector have not performed satisfactorily. The cooperatives exclusively for the visually impaired have not performed well, probably, due to following limitations:

- Scattered target group
- Limited choice of products
- Diversity in backgrounds of the target group
- Lack of unity of operations
- Lack of initiative, risk taking ability, awareness and self confidence
- Lack of infrastructure and organizational support
- Lack of special scheme of encouraging cooperatives of the visually impaired.

3.1.5 Community Based Rehabilitation : (Refer to Chapter on CBR for definition, importance, components and distinguishing features of the CBR)

3.2 Organized Sector

The realization of the dream of economic independence of the visually impaired person would necessitate their employment in the organized sector. It requires preparing them for employment and convincing the employers to extend them suitable employment opportunities.

3.2.1 Open Employment

a. *Definition*: Open employment refers to the placement of a person in open competitive wage employment in the organized sector viz.

- with State as well as Central Government;
- institutions, corporations and companies;
- establishments, factories, production units;
- schools, colleges, universities and research organizations;
- other such establishments.

b. *Characteristics*: Open employment has the following characteristics:

- Wage employment

- Competitive employment
- Employment is not due to charity or pity, it is due to production skills, abilities and qualifications
- All usual benefits available to the sighted persons are available to a visually impaired person also
- Conditions of employment and services conditions are the same for the visually impaired and the sighted
- Same terminal benefits are available to them

c. *Factors Affecting Open Employment*

i. *Government intervention in terms of :*

- augmenting training facilities;
- encouraging placement services;
- enacting and enforcing suitable laws on employment;
- supporting production cum training centres;
- extending administrative support.

ii. *Institutional support for :*

- developing training programmes;
- seeking Government intervention;
- creating public awareness;
- developing vocational guidance and counselling services;
- motivating the visually impaired to compete for open employment.

iii. *Involvement of following agencies for extending employment opportunities :*

- Trade Unions
- Employers' Federations
- Local administration

- Service Clubs

iv. *Availability of :*

- suitable employment aids; and
- adaptations in production processes and tasks.

d. *Merits*

- Social integration of the visually impaired into the community
- Full industrial wages and all other benefits including terminal benefits
- Financial security and possibility of savings
- Diversified avenues of employment matching with individual expectations
- Public awareness regarding their potentials
- Possibility of new employment opportunities and spreading the concept of open employment
- Confidence among the fellow workers and the employers regarding their production potentials.

e. *Illustrations*

(Source: Captain H.J.M. Desai's Planning Employment Services)

S.N.	Industry	Operations Suitable for the VIP
1.	Textile	Cellophane wrapping, packing, ribboning, labelling; bobbin cleaning; borah stitching; sorter- waste department, stamper; packers, hoistmen
2.	Machine Shop	Machine Operators - capstan lathe, central lathe, drilling, power punch, hand fly press, hand tapping, threading, milling, shaping, shearing, plastic moulding; coil winders, filing; inspection, core makers, assemblers, tube benders.

S.N.	Industry	Operations Suitable for the VIP
3.	Pharmaceutical Assemblers	droppers, cartons; packers and labellers; bottle washers and bottle sealers; conveyer belt operators and wooden case nailers; tailors.
4.	Telephone	Operators - power press, pin-vice hand drill, kicker press;
		Assemblers - armature, wiper, single and double piercing; riveting, gagging, rumbling springs, fixing and removing coils to plate;swaging.
5.	Cycle	Assembly - hub, brake, pedal; wrapping - mudguard, frame
6.	Match	Dozen packeting; inner and outer cover making, chemical grinding
7.	Plywood	Operating hand cutting machine, feeding veneer gluing and drying machines
8.	Electrical	All sorts of assembly
9.	Tea	Packeting, packing, operating drying machine, dhool fermenting
10.	Metal Box	Wadding and lidding, inspection of can tops, counting and packaging, assembly of necks and shoulders.
11.	Soap	Operating die stamping machine, counting and packing.

Based on this list, similar production operations may be identified in other industries. It is pertinent to mention that with suitable adaptations, it is possible to employ the visually impaired in a variety of other operations. Similarly jobs can also be identified in the commerce, management and professional areas for extending their open employment.

*3.2.2 Special Employment :*The 200 odd centres providing special employment in our country could be classified thus:

3.2.2.1 Sheltered Workshops
3.2.2.2 Transitory Employment Centres
3.2.2.3 On-the-job Training Centres

The first two categories have been the most commonly initiated. There are other centres which have initiated training in a few trades which are certificate level courses recognized by the relevant governmental authorities. The vocational training centres offer training which is generally informal, not very structured, is traditional and not very systematic. The stipend offered to trainees is just enough for sustenance. The latest trend which is welcoming is to admit the blind persons in regular ITIs, technical school or professional training centres which ensure integration of the individual.

The following issues need detailed discussion and consideration:

a. Recognition of the training courses
b. Viability of the training centres or the individuals
c. Employment potential on completion of training
d. Categories of disability to be covered
e. Vocation or task-oriented training
f. Level of integration during training and post training
g. Cost of such training and level of grants etc.
h. Evaluation of existing vocational training facilities and improvement thereof
i. Futuristic Approach:

For the special workshops to be more effective, some realistic and researched tips are:

● To reduce per capita cost on training, vocational training should be time limited, placement oriented and realistic.
● Focus at development of appropriate skills of the individuals and enhancing production of the centre.
● Apply for sales tax benefits on the purchase of raw material and sale of finished products,
● Encourage bulk and direct purchases, talk to manufacturers and get raw material at ex-works.

● Introduce proper inventory control
● Try for preferential sale to State departments, mass production, effective marketing etc.
● Proper production planning and man-job balancing is essential for efficiency.
● Muti-category approach would also render the training more cost effective.

3.2.2.1 Sheltered Workshops

a. *Definition*: Sheltered workshop is a work-oriented rehabilitation facility with a controlled working environment and individual vocational goals which utilizes work experience and related services for assisting a visually impaired person to progress towards normal living and a productive vocational status.

It is also considered a permanent, or semi-permanent vocational placement for individuals who are unable to find jobs in the community. It is to be considered a job and a place to go to work every day. It is a vocational setting, geared to take advantage of whatever vocational assets a client might have. It is meant to provide a resource in which an individual can make a contribution to the community.

b. *Distinguishing Features*: A placement in Sheltered Workshop is generally not accompanied by a complex of therapeutic services. Minimal help is generally available for minimal problems. An individual in this setting is treated as a worker, a worker who is making positive contribution towards production. He is made to feel he is in a job, a job in which he should take pride. He is engaged in a productive work, a work he should enjoy doing (Manual). This endeavour has the following distinguishing features:

- Suitable for a visually impaired who due to age, other disability or physical constraints cannot avail of open employment
- Keeps him confined without any hope for integration in society
- Advocates 'segregation and over-protection' and has a limited coverage
- His limited admission due to capacity constraint
- Limited choice of production activities and products

c. *Limitations*

- Lack of legal status
- Trades selected have no compatibility with the existing job scenario due to controlled environment
- Most undesirable and undignified way of providing rehabilitation to the visually impaired who are, otherwise, capable of availing open employment. In other words, it restricts open employment opportunities.
- This approach is suitable for the aged and severely visually impaired persons with multiple disabilities.

3.2.2.2 Transitory Employment

a. *Definition*: A transitory workshop is a work related rehabilitation approach within a controlled working environment with the ultimate objective of open employment.

b. *Distinguishing Features*

- Emphasis on movement of the individual whether his destination is the open labour market or extended employment
- Specifically structured as a work setting leading to open employment

- Offers vocational exploration and intensive on-the-job training
- Middle path approach of providing on-the-job training for a limited duration.
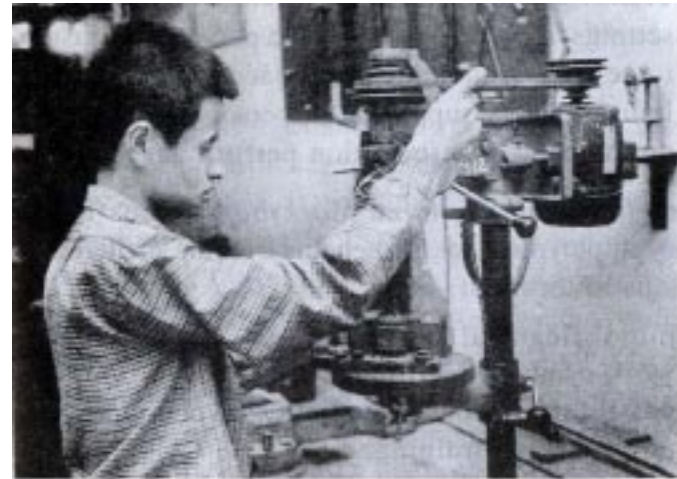
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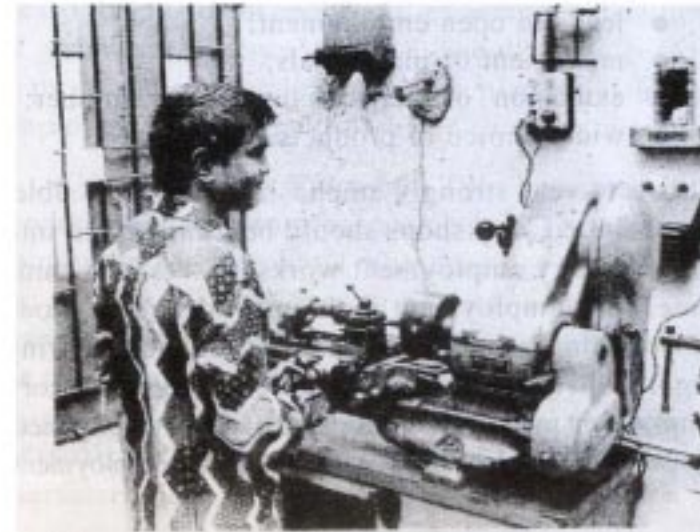
Operationg a Lathe

c. *Merits*

- Encourages open employment provided the trades selected are compatible with the employment opportunities.
- Training is provided in simulated industrial settings, it becomes easier for a person to adjust to new environment when placed outside.
- Initial financial support as the person is rewarded on the basis of production performance.

d. *Benefits over Sheltered Workshops*: Thus the transitory employment has the benefits over the sheltered workshops in terms of:

- initial financial assistance;
- work-oriented facilities;
- possibility of social integration on completion of on-the-job training;
- compatibility between training facilities and employment opportunities;
- leads to open employment;
- movement of individuals;
- extension of facilities to a higher number;
- wider choice of products.

This is to very strongly emphasize that, if possible, the sheltered workshops should be transformed into the transitory employment workshops. At the same time, open employment is the most desirable mode of providing economic rehabilitation and restoring dignity to visually impaired persons . The transitory employment must not be considered a type of employment in itself. It is merely a tool of expediting open employment.

3.2.2.3 On-the-Job Training Centres

a. *Explanation*: The On-the-Job training centre aims at providing work placement in a simulated industrial settings. It is a production activity and resembles an industrial set-up which has a primary objective of imparting employment oriented and task-based training to the individuals.

It is a step ahead of sheltered workshop in respect of nature of placement and training opportunities. In this case, placement is provided for a limited duration which depends upon nature of production activities or skills of individuals. Its major focus is imparting skill training and actual work experience to individuals who due to lack of requisite qualification and age cannot be enrolled under the formal vocational training programmes. This programme is designed to provide actual work experience for individuals who have not been able to get jobs due to limited ocational potential, lack of employment opportunities and poor condition of general economy (Manual). The ultimate goal is to prepare the individuals for open placement or self employment on completion of on-the-job training.

b. *Distinguishing Features*: This approach is a programme which provides training on a developmental continuum for individual who does not yet possess the motor skill necessary to perform work tasks. It provides progressive and appropriate training until the individual is ready to take a competitive employment or ready to live and operate in a vocational community (Manual). Such approach has the following distinguishing characteristics:

- Rehabilitation agency assumes the financial obligation during the period of training.
- Purpose is to impart specific job-oriented training for a limited duration.
- Such programme is supported with employment & placement services.
- Individual is expected to perform production and services activities similar to a formal production unit.
- The programmes undertakes sale of its products onpreferential or competitive basis.
- It tends to be economically viable.
- The production activities at the centre are in consonance with the open employment opportunities
- The centre generally extends training activities to persons with all categories of disabilities.

Plastic Moulding

c.   *Merits*: Such programme is more desirable - socially as well as financially. It has following advantages as compared to sheltered workshops as well as transitory employment:

- Economically more viable.
- Promotes appropriate self as well as open employment.
- Enables selective training and placement of individuals.
- Provides training on a developmental continuum.
- Provides progressive training until individual is ready to seek appropriate employment.
- Results into realistic vocational development.
- Ensures instilling social behaviour and social integration.
- Encourages training motor capabilities necessary to perform requisite works tasks.

d.   *Limitations*: Despite all its merits, on-the-job training is provided under simulated or sheltered conditions. It may always not be possible to find appropriate competitive wage employment for every individual. Such programme has the following limitations:

- The programme may give more importance to its profitability than quality of training
- The quality of on-the-job training may not be upto the mark
- The nature of training may not be in tune with employment opportunities
- Such programme may tend to emerge either as sheltered workshop or merely a production centre

- Such programme may attract provision of Indian Factories Act, Minimum Wages Act, Industrial Disputes Act or other such labour and industrial laws.
- Many a times, it may be difficult to sell products of such centres at remunerative prices.
- Higher overheads due to training activities may render it difficult to attain economic viability of the programme.

This approach, however, is more superior as compared sheltered to employment as well as transitory placement.

3.4 Futuristic Approach

Like integrated education, the existing placement services in the organized sector must emerge as centres of excellence for initiating, promoting and coordinating integrated training of the target group. This should be our ideal but, it should be progressively achieved on a time bound programme in the following sequence:

a.   Wherever possible, sheltered workshops must redefine their roles and progressively emerge as skill development centres aimed at promotion of gainful occupation of the individual.

b.   A nation-wide study on evaluation of the existing employment services must be carried out for establishing and evaluating their objectives and the strategies. The centres should redefine their objectives, modify their strategies and approach to emerge as employment oriented, skill development, economically viable units. It may require introduction of new vocations, new equipment, new curricula and new procedure of evaluation and certification. These centres should emerge as skill development cum placement centres.

c.   A time bound Plan of Action should be evolved to convert these Skill Development Centres in a phased manner to be promoters of integrated training, they becoming resource centres.

d.   New programmes of vocational training, income generation or economic rehabilitation should adopt integrated approach from the beginning itself. In this case, developmental organizations for the visually impaired should become the resource centres, programme implementation centres, advocacy agencies or support systems. The placement centres should develop and supply special equipment, carry out task analysis and provide information, extend individual preparatory services and coordinate admissions, supply of educational material and promote appropriate employment.

These centres must emerge as properly equipped, well maintained, appropriately staffed training and placement centres with structured training and suitable certification. There should be in-built provision for continuous evaluation and self-monitoring of the process and outcome of the activities. While core staff should be appointed on regular basis, part time and visiting professionals should be involved for upgradation of services.

4. Modern Placement Techniques

The economic independence and social integration of the visually impaired should generally be achieved through their competitive and open employment. It certainly requires preparing them for appropriate employment through suitable training and exploring all avenues of employment. Apart from administrative measures and legislative, constitutional and institutional support, it requires adoption of the following appropriate, result-oriented and relevant modern placement techniques:

4.1 Vocational Assessment and Work Preparation

Vocational rehabilitation may be achieved with or without work testing, aptitude testing, psychological testing, extensive and prolonged vocational guidance, reconditioning or vocational training.

4.1.1 Services: The promotion of vocational rehabilitation in the organized sector will necessitate provision of the following services:

a.   *Assessment*: Obtaining a clear picture of a person's remaining physical, mental and vocational abilities and possibilities.

b.   *Evaluation*: Evaluating level of skill, aptitude, functional and occupational abilities.

c.   *Guidance*: Advising the person accordingly in the light of vocational training and employment possibilities.

d.   *Training*: Providing any necessary reconditioning, toning-up or formal vocational training or work preparation.

e.   *Assistive Devices*: Organizing appropriate vocational assistive devices to enhance mobility, functioning capabilities and capacities of the individual.

f.   *Placement*: Assisting individual to find appropriate and suitable work or service opportunities in the open or sheltered environment.

g.   *Follow up* until complete rehabilitation is achieved.

4.1.2 Outcome: Vocational assessment of this nature can:

● evaluate work performance under actual work conditions;

● indicate the degree of work tolerance, the hours a person can work without fatigue, his ability to stand noise and other environmental stresses, interruptions etc.;

● assist to develop his self-confidence, self-reliance and personal adequacy;

● assist the person to realize and accept his own potentials and limitations;

● assist in vocational orientation.

Training in motor rewinding

Training in Braille Shorthand

4.1.3 Aims: The procedure followed for vocational assessment, work preparation and placement would achieve the following objectives:

- To assist a person to gain or recover the habit of work
- To give advice on any social problems which emerge in the process
- To provide physical reconditioning
- To provide medical, physical, psychological and vocational assessment of work capacity.
- To build up person's morale, help him to recognize his abilities and to think positively about his future
- To place the person in employment or in suitable course of vocational training as a prelude to employment.

4.1.4 Pre-requisites: In order to benefit from the procedure of promoting employment in the organized sector, an individual should:

- be of a working age, or approaching it, but not too old to secure appropriate placement at the end of the course;
- have, or likely to have at the end of the procedure, the physical and mental capacity to work;
- have reasonable prospects of getting a job at the end of the course.

The benefits of vocational assessment and work preparation would be lost unless the person concerned obtains appropriate placement on termination, either with or without suitable vocational training.

4.2 Selective Placement

a. *Introduction*: The selective placement involves:

- using all the normal services and provisions; and
- adjusting them as necessary to their known and carefully assessed needs.

It is the next step after assessment, vocational guidance, vocational training or on-the-job training and involves three distinct processes:

i.   Knowing the individual
ii. Knowing the job
iii. Matching following qualities of the individual with the job:

- Educational background, work experience and age
- Family background, economic and social status and occupation
- Level of training in orientation and mobility and activities of daily living.

b. *Basic Principles*

- Meeting the physical requirements of the job
- Compatibility between the training availed and job provided
- Matching between the potentials of the individual and job requirement
- Placement not resulting to any occupational hazard or risk to the visually impaired or fellow workers
- Enhanced social integration
- Conducive working conditions and environment
- Placement on grounds of suitability for the job, not pity, charity or sympathy.

4.3 Job Clubs

a. *Introduction*: A group of visually impaired persons meets everyday, in a structured meeting supervised by a counsellor using a 'lesson plan' schedule of daily activities. Half a day is spent in obtaining job leads

and interviews in the office; the other half is spent in going out to these interviews. The counsellor closely observes and supervises as the client is engaged in obtaining leads, calling employers and writing letters.

b. *Essential Features*

- Train the counsellor to provide adequate counselling.
- Emphasize creation of job leads.
- Encourage a person to maintain the job once he is placed.
- Rapidity of obtaining job is dependent upon:
  * consistency of attending sessions
  * number of new job leads created
  * number of interviews attended
  * interest of counsellor

- Involve other employment agencies, concerned Government departments, voluntary developmental organizations and employers' federations actively.

4.4 Work Stations

a. *Introduction*: The Work Station is a step between open placement and the training or the sheltered employment. The aspirant is placed under the conditions of actual employment but without formal employment. He is expected to:

- perform actual work;
- follow all the rules as applicable to other workers in terms of:
  * timings
  * uniform
  * work performance
  * other conditions of employment

However, the employer has no obligation in terms of:

- payment of wages
- maintenance of attendance cards
- incidental expenses
- compensation for hazards
- insurance coverage

The payment in terms of stipend, local transport, incidental expenses and insurance coverage may be provided by the local implementing agency or the Government department. At the end of the training, it has been observed that the employer normally absorbs the person in his firm or unit.

b. *Merits*: It serves as an excellent arrangement wherein a person is under direct observation of the prospective employer who gets an opportunity to study his potentials, talents and adaptability to the job. The approach has the following merits:

- Demonstrates production potentials of the visually impaired.
- Convinces the co-workers regarding his production skills
- Enables the employment officers to:
  * perform task analysis
  * do individual planning
  * assist the VIP to adjust to the job

- Economical and cost effective as compared to other modes of training
- Ideal for a person who had no formal training
- Reduces the gap between on the job training or transitory employment and open placement

● Establishes direct contacts between the trainee and the prospective employer and improves chances of open employment

c. *Factors Affecting Success*: While the work station approach seems to be practical, result-oriented and cost effective, its success depends upon the following aspects:

● Proper selection of the job depending upon:
  * ability
  * skills
  * potentials and
  * interest
● Proper supervision by the employer and the placement officer
● Willingness of the employer to extend open employment on completion
● Involvement of the concerned officials
● Willingness of the implementing agency to incur expenditure on stipend, transportation and incidentals
● Most important, adoption of this approach by the:
  * employment exchanges
  * vocational rehabilitation centres
  * district rehabilitation centres
  * voluntary placement organizations

4.5 Social Reinforcement

a. *Definition*: The Social Reinforcement approach portrays the employment process as an informal job information net-work in which the person with early knowledge of job openings selectively passes this information on to unemployed persons who are then likely to reward the job informants in a social way.

b. *Merits* :

● Prevalent for employment in unorganized sector, small units where recruitment process has not been streamlined
● Effective where employment *per se* does not pose a very serious problem
● May be adopted as a supplementary tool for encouraging employment
● May enable the aspirants to seek employment under legal provisions for which they are otherwise eligible

4.6 Job Camps

a. *Definition*: It involves inviting the prospective employers and unemployed disabled persons *en masse* and providing them appropriate conditions for mutual interaction for expediting the employment process. It has been adopted by special employment exchanges and the disabled welfare voluntary organization for the person with disabilities.

b. *Merits*:

● Employer gets to meet, examine and interview a large number of disabled persons and to select the most suitable ones
● Person with disability faces a large number of interviews on the same day
● Suitable for developing countries where there is lot of unemployment and lengthy selection procedures are involved.

c. *Limitations*:

- A strong 'employer-pull' is essential
- Not a complete process by itself
- Merely one aspect of the employment process
- Incentives, motivation and follow-up are essential

4.7 Institutional Placement Services

Use of continuity tester

Training in telephone operating

a. *Procedure*

- Circulate a detailed resume of the individual giving following details among the prospective employers:

  * educational qualification
  * past experience
  * area of specialization
  * age and areas of interest

- Display the offers received from the employers
- Encourage the individuals to apply for the job
- Provide facilities and infra-structure for the interviews
- Arrange initial interviews.

This approach has proved very effective for the placement of various professionals, particularly in case of well established and reputed institutions and universities offering professional courses. The development institutions and placement agencies may adopt this technique for expediting employment in the following areas:

- physiotherapy, massage
- stenography, touch typing
- telephone operating
- computer programming, data entry
- social work, office management, marketing

4.8 Legislative Measures

One of the means of creating employment opportunities for the disadvantaged groups is through enactment of suitable legislation in terms of:

- job reservation
- designation of specific types of jobs
- allocation of priorities or preferences in employment

The propriety and need for enacting legislation has always been debated at various platforms:

4.8.1 The arguments in favour of legislation are:

- Creates jobs for the target group
- Demonstrates Government support for employment
- Creates law enforcing agency which may force the employers in this regard
- Recognizes potentials and accords due status to the target group
- Supports other techniques of expediting employment

4.8.2 The arguments against such legislation are:

- Legislative compulsion is wrong in principle
- Against the constitutional right of freedom of employment
- Individuals so placed may feel they are employed on sufferance and not on merit
- May encourage them for the jobs for which they are not suitable
- Effectiveness of legislation as a social measure of promoting competitive open employment is doubtful
- May pre-empt other measures on encouraging employment.

The legislation, by itself, may not result into employment. It needs to be supported by a strong law enforcing agency which may entail considerable expenditure on the public exchequer.

Whatsoever may be the limitations of the legislative measures, their existence and implementation always support other measures.

4.8.3 The Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995

The Parliament of India enacted this Act on 22nd December, 1995 to give effect to the Proclamation on the Full Participation and Equality of the People's with Disabilities in Asia and Pacific Region. The President of India gave his assent to the Act on 1st January, 1996 and it came into force with effect from 7th February, 1996.

This Act is very comprehensive and encompasses provision relating to monitoring and implementation machinery, prevention of disability, education, employment, affirmative action, non-discrimination, research and manpower development and recognition of institutions for the persons with disabilities.

The Chapter VI on employment envisages the following provisions:

- Identification of posts in the establishments which can be reserved for persons with disabilities (S-32).
- Job reservation to the extent of 3 percent of the vacancies in every establishments in the posts identified for each disability (S-33).
- Seeking information from each establishment relating to appointments of persons with disabilities in such vacancies (S-34).
- Empowering Special Employment Exchanges to have access to any relevant record or documents in the possession of establishments as regard such reservation (S-35).
- Provision for vacancies not filled to be carried forward (S-36).
- Maintenance of records by the employers as regards filling of identified posts (S-37).

- Formulation of special schemes by the local authorities and the appropriate Governments for ensuring employment of persons with disabilities (S-38).
- Reservation of 3 percent seats in all the educational institutes receiving grants from the Government (S-39).
- Reservation of 3 percent in all poverty alleviation schemes benefits for such persons (S-40)
- Incentives to employers both in public and private sectors to ensure that at least five percent work force is composed of such persons (S-41).

The Persons with Disabilities Act has made very bold provisions for promoting competitive employments for the persons with disabilities. The outcome of these provisions would, however, depend upon its effective implementation.

Similarly a number of State Governments have enacted legislation on job reservation. In Gujarat, reservation of one per cent of jobs in the establishments and undertakings employing more than 250 workers has resulted into employment of a large number of disabled persons.

All these techniques on promoting employment are not mutually exclusive. A combination of various approaches may be very effective in expediting employment. Whatsoever approach is selected, the focus should always be the individual. The client centred approach is most essential. The economic rehabilitation should definitely be the ultimate objective of any rehabilitation programme.

SCHEME OF NATIONAL AWARD FOR THE PEOPLE WITH DISABILITIES

The Ministry of Social Justice and Empowerment, Govt. of India has launched this scheme keeping in view global thinking on the rehabilitation of people with disabilities.

CATEGORIES OF AWARDS :

1. *Best Employees with Disabilities* : 15 Awards of Rs. 10,000 each, a citation, a certificate and a metal medal

2. *Best Employers of Persons with Disabilities* : 10 Awards with a shield, a citation and a certificate

3. *Best Placement Officers of Persons with Disabilities* : 4 Awards with a citation, a certificate and a shield

4. *Best Individual for the cause of Persons with Disabilities* : 5 Awards of Rs. 1,00,000 each with a certificate and a citation

5. *Best Institution for Persons with Disabilities* : 1 Award of Rs. 1,00,000 with a certificate and a citation.

6. *Best Technological Innovation for the cuase of Disabled* : 1 Award of Rs. 1,00,000 with a certificate.

Adaptability of Innovation to provide Cost - Effective Technology : 2 Awards of Rs. 50,000 each with a certificate.

7. *Outstanding Creative Individual with Disabilities* : 1 Award of Rs. 1,00,000 with a certificate and a citation.

8. *Outstanding Work in the Creation of Barrier-Free Environment for People with Disabilities* : 3 Awards with a certificate and a citation.

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New Delhi - 110 001

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CHAPTER X

Community Based Rehabilitation

1. The Existing Scenario

As explained in the third chapter on Demographic Pattern of Visual Impairment, the significant features that emerge are:

- In majority of cases, visual impairment is adventitious and its on-set takes place predominantly after the age of 45 years.
- Prevalence rate is the highest in the age group 60 & above and the lowest in the age group 0-4 years. It rises steadily with the increasing age both in the rural as well as urban areas. It is higher in the rural as compared to urban areas for all the age groups.
- Incidence rate is the highest in the age group of 60 & above and the lowest in the age group of 5 to 39, it is higher in rural areas (25) as compared to urban areas (20).
- As females constitute 53.89 percent of the population of the visually impaired, incidence of visual impairment among females is comparatively higher.
- As distribution of visual impairment is relatively more in the rural areas (83.69%), their population is predominantly rural.
- Rehabilitation centres are few, confined to urban areas and cover a few hundred people in the working age group 16-35 years.

2. Need for Promotion of CBR

On analyzing the existing rehabilitation services, the following observations can be made:

2.1 Limited Coverage of the Existing Programmes

The existing special schools in India, at present, cover only 18,000 and integrated education programmes cover 6,000 visually impaired children. Even if special education is extended to all visually impaired children of the school going age (which is never going to be possible), the coverage would be only 3.2 per cent of the total population of the visually impaired.

The existing vocational as well as on-the-job training centres at present cover a mere 5,000 visually impaired persons. The existing trades are urban-oriented and do not necessarily lead to employment.

2.2 Least Preference to the Visually Impaired

Most of the rehabilitation programmes aimed at the comprehensive rehabilitation of all categories of persons with disabilities are largely for the locomotor handicapped only. The coverage of the visually impaired in the following programmes has been almost negligible:

- Vocational Rehabilitation Centres and Special Employment Exchanges under the Ministry of Labour
- District Rehabilitation Centres Scheme
- Scheme of Community Based Rehabilitation
- Scheme of Aids and Appliances for the Persons with Disabilities under the Ministry of Social Justice & Empowerment
- Scheme of Integrated Education of the Disabled Children under the Ministry of Human Resources Development
- Disability Strategy under Council for Advancement of People's Action and Rural Technology.

2.3 Lack of Social Security Measures

Most developing countries have not yet introduced social security measures for assuring a minimum standard of living for persons with disabilities. Some State Governments have introduced disability as well as old-age pension schemes. Due to limited budget allocation, cumbersome procedures, lack of public awareness, and lack of an effective delivery system, the coverage has been limited. The PWD Act, 1995 has also made no reference to social security measures for such persons. A visually impaired person is normally therefore cared for by his family members and the community.

Thus the majority of persons with disabilities have no access to rehabilitative, curative or support services under the existing pattern and nature of services. It is desirable to explore alternative avenues of reaching millions of such unreached persons. Considering these observations, the most realistic and practical solution to the problem of rehabilitation is introducing individual need-based, cost effective and rural based rehabilitation programmes.

2.4 CBR: only Viable Alternative

Keeping in mind the vast distribution of persons with visual impairment in the rural areas, the late on-set of visual impairment and the exorbitant costs of initiating and maintaining an institution, and the inherent limitations of an urban based institution, the only viable alternative is a programme which can reach out and provide need based services to such persons of all age groups and yet be cost effective.

2.5 Indian Initiatives on CBR

A large number of leading NGOs realized during the early 1980s that non-institutional rural projects for persons with disabilities were indispensable. A large number of NGOs developed, presented, implemented and perfected nation-wide programme on promotion of CBR. The major Indian initiatives include:

2.5.1 PL-480 Project: A Rural Rehabilitation Centre for the Blind was started during 1973 at Madurai with the financial support from PL-480 grant of the U.S.A. The Centre was established under the guidance of renowned experts Major Bridges and Mr. Robert C. Jaekle from the American Foundation for the Blind, U.S.A. (now known as Helen Keller International)

2.5.2 CBM's Initiative: Mr. Robert C. Jaekle, truly the Father of CBR, joined the Christoffel Blindenmission and initiated a rehabilitation programme for the rural visually impaired in Tiruchirapalli District of Tamil Nadu. He also established a training centre at Musiri for the training of CBR field functionaries.

2.5.3 NAB RAC Project: A nation-wide project entitled *"Social and Economic Rehabilitation of the Rural Blind"* was promoted by the Rural Activities Committee of the National Association for the Blind during 1983 with the support of the then Royal Commonwealth Society for the Blind now renamed Sight Savers International. The programme was subsequently modified and promoted as Comprehensive CBR Project for the Visually Impaired. This project was implemented by various agencies all over India and received support from a large number of funding and developmental agencies:

- Sight Savers International
- DANIDA
- NORAD
- OXFAM
- Helpage International
- South Asia Partnership
- World Blind Union
- Ministry of Social Justice & Empowerment
- L.D. Jhaveri Foundation
- Shri Manav Kalyan Trust
- National Institute for the Visually Handicapped
- State Bank of India
- Department of Social Justice & Empowerment
- Shri Raj Shobhag Ashram

2.5.4 District Rehabilitation Centre Scheme: The Ministry of Social Justice & Empowerment launched a nation-wide District Rehabilitation Centres Scheme during January 1985, with the collaboration of the National Institute of Disability and Rehabilitation Research, U.S. Department of Education and UNICEF. The scheme aimed at creating awareness about the production potential of persons with disabilities and establishing a model for their comprehensive rehabilitation.

Evaluation of the scheme on completion of five years revealed that although there were many areas of deficiency which could be improved upon, the scheme did make considerable impact in the areas of implementation. Though the scheme had been *"Community located"*, it had not been *"Community based"*.

2.5.5 District Blindness Control Societies: India has launched the National Programme on Control of Blindness since 1963. To begin with, the major focus of this programme was prevention and cure of Trachoma and provision of vitamin A for prevention of Xerophthalmia. After the National Survey of 1971-74 established that cataract caused almost 55 percent of blindness, cataract became the major focus of this programme. The major emphasis of the programme is on expansion of infrastructure and training of manpower in eye care with the objective of capacity building for cataract surgery.

The District Blindness Control Societies have been established since 1993 to promote eye care at the grass root level. These societies seek better participation of local administration, government departments viz. social welfare, education and information. The main objective behind this move is to bring eye-care in the mainstream of society and bring about inter-sectoral cooperation. There is a scope for active participation of non-Governmental organizations devoted to eye care, CBR and rural development.

There is tremendous increase in allocation of financial resources by the Government for promoting eye care services. International

support for this purpose has also increased manifold, initially from DANIDA and WHO, and recently a large loan from the World Bank. These national efforts are being augmented by multi-million assistance from the World Bank in seven states of the country over a period of 1994 to 2001. As a result of these efforts and resource allocation, the total number of cataract operations increased from 1.2 million during 1989 to 2.7 million during April, 1996 to March, 1997 (Limburg, 1999), but this is still inadequate to clear the backlog.

A rapid assessment of cataract blindness and surgical coverage in the seven World Bank assisted States conducted during 1998 establishes that in most States, the prevalence of blindness had decreased as compared to situation during 1996. The prevalence, however, continues to be higher in females as compared to males, though there was evidence to show that the utilization of cataract surgical services has increased among women.

The District Blindness Control Society (DBCS) is the first systematic attempt on promoting comprehensive eye care which encompasses CBR along with eye screening, eye treatment, eye surgeries and prevention of visual impairment. Now, health oriented programmes have also started recognizing the need for promoting CBR as a part of comprehensive health care approach.

2.5.6 CBR Network: It is estimated that there are over 800 organizations promoting CBR for persons with disabilities in India. The CBR Network was a platform set up as a result of a Workshop on CBR sponsored by NORAD in September, 1992 and later converted into a legal entity in 1997. The objectives of the National CBR Network are:

- to document CBR approaches, methodologies in India and public policy in favour of CBR;
- to publish a CBR frontline digest for workers at the grassroot level;
- to share and disseminate information regarding CBR in a partnership market;
- to influence public policy in favour of CBR; and
- to establish a data base on CBR.

The CBR Network has divided India into four zones - North, South, East and West and leading disability development organizations have been entrusted the responsibility of promoting networking and disseminating information.

Website: http://www.cbrnet.com
E-mail: cbrnetwork@vsnl.com

2.5.7 Rehabilitation Council of India (RCI): The RCI has been constituted through an Act of Parliament, the RCI Act, 1992 which came into force with effect from July, 1993. The main purpose of the RCI is to standardize the syllabi for training of various rehabilitation professionals. It has also been assigned the responsibility of registering these professionals with the object of ensuring that only qualified and duly registered people render services to people with disabilities. It has evolved the scheme of training the rehabilitation professionals and the medical professionals working in the Primary Health Centres through Bridge Courses.

The RCI has also been promoting programmes of continuing education to ensure that knowledge of rehabilitation professionals is updated from time to time so as to provide best possible services to persons with disabilities. The first continuing education programme under its banner has been an updated CBR - its concepts, technology and application. Through this programme, it has identified and sensitized national resource persons from across the country. It has developed resource persons to form regional CBR faculty for different regions.

As a part of its Scheme of Bridge Courses, it has covered CBR professionals for completing bridge courses and seeking its registration.

Website: http://www.rehabindia.com
E-mail: rehabstd@nde.vsnl.net.in

2.5.8 National Policy: The Ministry of Social Justice & Empowerment convened a National Conference during 20-22 September, 1993 to evolve a National Policy for the Persons with Disabilities. As a part of National Policy, it was unanimously resolved that the Ministry should evolve a separate scheme on CBR for promoting comprehensive rehabilitation of persons with disabilities in the rural and backward areas.

2.5.9 Pilot Project on Medical Rehabilitation: The Ministry of Health, Govt. of India launched a Pilot Project on Medical Rehabilitation on 22nd November, 1995 with All India Institute of Physical Medicine & Rehabilitation as the Nodal Implementing Agency with emphasis on provision of rehabilitation services through primary health care.

The main objective for inclusion of CBR in the Health Care Delivery Services are:

- Prevention of disability causing disorders
- Early detection of disability causing disorders
- Early medical intervention
- Early rehabilitation intervention
- Capacity building of different centres from peripheral up to specialized centres
- Training of manpower required for service delivery, teaching and research activities at different levels
- Equipping / strengthening Primary Health Centres (Wadhwa, 1998)

The rationale for incorporating CBR into health care system is that instead of creating another large vertically structured CBR programme, it appears logical to train the existing health care manpower in different aspects of CBR by equipping them with the knowledge and skills and better equipping all components of Health Care Delivery System in a phased manner, spread over a decade or more, throughout the country.

2.5.10 Persons with Disabilities Act: The President of India gave assent to the *"Persons with Disabilities (Equal Opportunities, Protection of Rights & Full Participation) Act, 1995"* on 1 January, 1996 and it came into force with effect from 7 February, 1996. The main objectives of the Act are to spell out the responsibilities of the State towards the prevention and early detection of disabilities and recognition of the rights of persons with disabilities to enable them to enjoy equality of opportunities and full participation in national life.

Apart from the objectives of preventing the occurrences of disabilities, access to free education, job reservation, provision of assistive devices, allotment of concessional land and non-discrimination in transport, on road and built environment, the Act envisages promotion and sponsoring of research and manpower development programmes on various aspects including CBR.

The Act thus recognizes and endorses the need for promoting research as well as development of human resources in the area of rehabilitation including CBR. The section on education also desires the appropriate Government to integrate students with disabilities in the regular schools.

2.5.11 CAPART Initiative on Disability Strategies: The Council for People's Action and Rural Technology has developed and adopted a strategy to promote participation of people with disabilities in programmes for rural development. As a part of "Disability Strategy", the CAPART will extend support to non-Governmental organizations whose project proposals are in consonance with the overall thrust and guiding principles of the strategy, and which will further its implementation.

The focus areas of the strategy are social mobilization, capacity building, rural infrastructure development, promotion of indigenous technologies and net-working.

2.5.12 CBR Forum: The CBR Forum for Persons with Disabilities was constituted by Miseoreor, a German funding agency during 1996. It is a Programme Unit of Caritas India, its legal holder. Its mission is to play a proactive and promotional role in CBR of persons with disabilities in India, ensuring wide coverage with focus on the disadvantaged group such as the poor, women and people living in rural areas and urban slums.

The CBR Forum encourages and supports appropriate organizations, programmes and projects for CBR and does not implement the same directly. It also supports measures on prevention of disabilities, appropriate training, creation of public awareness, networking, advocacy, innovations and research in issues pertaining to CBR.

The vision of the CBR Forum is that people with disabilities have equal opportunities leading to improved quality of life and fully participate in a society that respects their rights and dignity.

The CBR Forum is emerging as a leading source of funding for various CBR projects.

2.5.13 CBR Scheme of the Ministry: The Scheme to Promote Voluntary Action for Persons with Disabilities evolved during 1998 by the Ministry of Social Justice & Empowerment, Government of India, provides grant-in-aid to voluntary organization for the promotion of CBR. The Ministry extends financial support for the following manpower (Ref. No. 21(25)/ 98-DD-II):

- Rural Rehabilitation Volunteers
- CBR Personnel or Multi-rehabilitation Workers
- Social Workers
- Specialists - Therapists and Educators
- Voluntary Workers
- Project Coordinators / Directors

This is first time that the Ministry of Social Justice & Empowerment has given due recognition to the concept of CBR in its major grant-in-aid scheme.

2.5.14 Bridge Course for CPR Workers : According to the Rehabilitation Council of India, the use of expression CBR is improper due to following reasons:

- Communities are very poor
- People cannot take financial responsibility for the programmes
- Difficult for them to take initiative in a developmental programme.
- During the day, most people in the village are away in the field, hence their involvement is not possible.

As the participation of community in the rehabilitation programme is crucial, the RCI has renamed the programme as "Community Participatory Rehabilitation" and has launched the Bridge Course for CPR Workers.

a. *Objectives*
- To involve community in all activities of rehabilitation.
- To mainstream people with disabilities in village community.
- To enhance self esteem and guidance of people with disabilities with the involvement of community.
- To engage experts to visit rural areas to offer appropriate assistance and guidance.

b. *Duration*: One month (6 days a week, 24 days) i.e. 145 hours.

c. *Eligibility*: Any person who has completed minimum 8th standard and has worked in rural areas for a minimum period of three years.

The Rehabilitation Council of India will provide Registration Certificate to all those people who complete this course as Rehabilitation Personnel. This is a bold step in the right direction as it will provide credibility to the field workers and the concept of CPR.

2.6 CBR - A Movement

All these initiatives and programmes establish that CBR is no more a pilot project or a programme on reaching the unreached but is now slowly but steadily emerging as a movement for promoting comprehensive eye care and rehabilitation of persons with eye problems or visual impairment. The achievements and efficacy of existing CBR strategies establishes that the only way of reaching out to the unreached persons in rural areas is to initiate and implement CBR for persons with disabilities. For developing countries, comprehensive CBR is not a matter of choice but a compulsion. While components, implementation plan, monitoring procedures and level of community involvement in CBR approach may be graded options - CBR approach *per se* is the only alternative available at present to reach the unreached millions of persons with disabilities in these countries.

3. Concept of CBR

To understand CBR, it is essential to define and explain the three terms "community", "based" and "rehabilitation". It is important that the exact meaning and implication of each term is understood and used with consistency.

3.1 Community

3.1.1 E. Helander's (1992) Definition : *"A community consists of people living together in some form of social organization and cohesion. Its members share in varying degrees political, economic, social and cultural characteristics, as well as interests and aspirations, including health. Communities vary widely in size and socio-economic profile, ranging from clusters of isolated homesteads to more organized villages, towns and city districts."*

3.1.2 CBR Working Group (1997) Definition : *"In the CBR context, community means (a) a group of people with common interests who interact with each other on a regular basis; and/or (b) a geographical, social or Government administrative unit"*.

3.1.3 Explanation of the Term "Community": Generally communities are not in every case homogeneous or static entities. A "traditional" rural community might not have all its members coming from the same ethnic group, speaking the same language or sharing the same culture and religion. Only some of these conditions might exist in other rural or in marginal urban settlements, and as a consequence a "community spirit" might not be so easy to identify. In such an environment, it may take longer to get a community response to the call for an effort to show solidarity with the disabled persons.

In general terms, a community is a sub-set of society but larger than a family. It constitutes a group of people, living together in social association, harmony and understanding. The existence, involvement, co-operation, interest and participation of the members of community influences survival, progress, development and welfare of the individual, directly or indirectly. This group of individuals generally have a common goal, common cause and develop a sense of belonging. They share their views on their political, cultural, economical and social ideology with each other.

Community, in general, comprises of family members, neighbours, friends, co-workers, reference groups or opinion leaders, local administrative authorities, local transport authorities, postman, school teacher, village headman, local revenue officials, nearby shopkeeper, local development agencies, local welfare agencies, and other such people or officials.

3.1.4 Explanation of the Term "Within Community": In the ILO-UNESCO-WHO approach to CBR, the phrase *"within community development"* is understood to be the following strategy recommended by United Nations (Working Group on CBR, 1997):

"... the utilization, [in an integrated programme], of approaches and techniques which they rely on local communities as units of action and which attempt to combine outside assistance with organized local self determination and effort, and which correspondingly seek to stimulate local initiative as the primary instrument of change."

The concept *"within community"* refers to the stimulation of local initiative which may be supported with outside support, advice and specialized inputs for ensuring community empowerment. The approach ensures that what is done at the initiative of community in the name of CBR actually fits into the reality of community and is solely owned by community itself.

3.2 Based

The term *"based"* signifies that rehabilitation and integration of the disadvantaged individuals is the responsibility of the family and community. It is essential that community realizes that all the human beings are of equal worth and are entitled to equal rights, privileges and responsibilities. It is the responsibility of the community to extend appropriate opportunity for their complete rehabilitation and acceptance in the mainstream of society. The responsibility of the caring of the disabled person is ultimately that of his family and community. Whatever services are provided by a specialist agency are largely interventional and need-based and cannot ever take on a permanent nature.

Ensuring the active participation and support of community in promotion of comprehensive rehabilitation of its members is imperative due to following factors:

3.2.1 Foundation of CBR: CBR is founded on the principles of equity, equality, equal rights and social justice. It implies that disadvantaged groups in the community have the inherent right of availing services and opportunities at par with other individuals. For them, the community is a backbone, a support system which ensures their survival, growth, progress and complete integration. It is the root of a fruit tree which encourages their active and meaningful participation in all spheres of social life. It is the bridge which connects the individual to a productive social life. It implies that visually impaired persons are entitled to atleast such privileges which they would have been entitled to, had they been sighted.

3.2.2 Importance of Community: Most visual impairment is caused primarily by environmental factors - disease, lack of ophthalmic facilities, lack of public awareness, superstitions, wrong treatment, lack of early screening and eye check-up facilities. Thus most of visual impairment is acquired and not necessarily due to the fault of the individual. The family is the right place and community the base for creating a rightful place and enhancing acceptance of such individual. The family is the first social unit of the individual and it is essential that this unit is the place which accepts him totally and plans for his total development.

3.2.3 Rehabilitation - A Continuous Process: CBR programme initiates the process and provides individual need-based services with the active participation, involvement and understanding of the community. The prime responsibility of the CBR programme is to provide the technical expertise and training in the skills of rehabilitation to the visually impaired, the family and the community at large. The ultimate objective is that the community is expected to continue providing further training, support services, tangible as well as intangible inputs, and above all, accept the individual in its fold. Rehabilitation is a continuous process and the community takes the responsibility of providing further services.

3.2.4 Use of Community Resources: Considering community as foundation of CBR programme would help to sensitize any one to the existence and use of abundant community resources. It would help to utilize resource from within and render the programme cost effective, low cost and economical. The cost

to CBR programme would merely be provision of technical support, outside expert services and manpower for the promotion of the concept. Whereas community would be able to contribute all the tangible as well as intangible local resources already available there. Examples are place for imparting training, local trainers, raw material for local crafts, shed for income generation activities, marketing facilities etc.

The interesting part is that most community resources are easily available, accessible and affordable. The CBR programme needs to encourage community to use these resources for the integration and complete rehabilitation of its own members.

3.2.5 Outcome of CBR Programme: If community participates in programme planning and its implementation, the CBR approach would be sustainable and would ensure delivery of services for ever. It would also ensure involvement, understanding and participation of the community on a permanent basis. It would promote sense of belonging among the individuals and reduce dependence on outside inputs and services. It would bring about self-reliance and complete rehabilitation of the individual.

Community has plenty of resources, desire to support and potential to promote appropriate rehabilitation. What it lacks is appropriate information, skills, technology and support system which have to be organized by the CBR programme as inputs and service delivery.

3.3 Rehabilitation

The dictionary meaning of rehabilitation is to *"return or restore to previous state or condition"*. In other words, rehabilitation signifies restoring any individual to social, functional, economic status he/she enjoyed before the onslaught of impairment. It refers to all the measures which need to be taken to bring the individual to her/his functional capabilities which he possessed before his visual impairment.

The understanding of rehabilitation needs to be modified in case of congenital visually impaired persons or those who were performing such activities which can not now be easily performed due to nature of activities. In case of congenital visual impairment, the term rehabilitation signifies restoration of an individual to a functional status which he/she might have attained if he/she were sighted in the same environment or family conditions. In case of such persons who can not perform the activities which they were performing prior to visual impairment, the term rehabilitation would mean performance of possible activities which are close to activities being performed earlier. Thus rehabilitation signifies restoration of any individual to previous, probable or possible activities which that person may perform despite visual impairment after certain training, retraining, other tangible or intangible inputs.

3.3.1 ILO's Definition: *"Rehabilitation involves the combined and coordinated use of medical, social, educational and vocational measures for training or retraining the individual to the highest possible level of functional ability"*.

3.3.2 Sight Savers' Definition: "Rehabilitation is a need-based, goal oriented, time limited process of providing a disabled person with the knowledge and skills required, together with the requisite special equipment and training in the use of that equipment, within an individually appropriate time frame, thus empowering him to change his life and to participate actively in his family and community to the fullest extent possible".

3.3.3E. Helander's Definition : "Rehabilitation includes all measures aimed at reducing the impact of disability for an individual, enabling him or her to achieve independence, social integration, a better quality of life and self-actualization".

Rehabilitation thus includes not only the training of disabled people but also intervention in the general systems of society, adaptations of the environment and protection of human rights. Disabled people should have the same rights to a life dignity as others, and there must be no exceptions. Special attention

may be needed to ensure access to health, social services, education, work opportunities, housing, transportation, information; culture, social life including sports and recreational facilities, and representation and full political involvement in all matters of concern to them.

3.3.4 Explanation of the Term: In the general sense, rehabilitation encompasses:

- medical rehabilitation i.e. cure of curable disability and lessening the disability to the extent possible
- complete social integration
- economic rehabilitation to the extent possible
- education of the children of the school-going age, and
- providing all the available concessions, benefits, guidance and counselling.

3.3.5 Outcome of Rehabilitation: All measures which aim at rehabilitation should ensure skill enhancement, independence, self reliance, self confidence, complete integration and empowerment of the individual. It should result into enhanced quality of life, enhanced work efficiency, gainful occupation economic independence of the individual. It should enable the individual to lead a normal, productive and contributory life of dignity, respect and social acceptance.

3.4 Definition of CBR

CBR is an extension of the term rehabilitation with the major difference in the mode of delivery of services and the venue for imparting training and other inputs leading to comprehensive rehabilitation. When the term CBR is expatiated, it means imparting training and providing services to the individual in community itself with the active participation of the family and the community leading to comprehensive rehabilitation.

3.4.1 WHO Definition of CBR : *"CBR involves measures taken at the community level to use and build on the resources of the community, including the impaired, disabled and the handicapped persons themselves, their families and their community as a whole"*.

3.4.2 Modification of the Definition: In the context of developing countries, the definition of CBR can be modified. It should:

- be cost effective, low cost individual need-based and result-oriented; and
- result into the complete integration of the individual into community.

Once rehabilitated, a person should lead a more productive life, thus helping the community economically.

3.4.3 Helander's Description: *"CBR is a strategy for enhancing the quality of life of disabled people by improving service delivery, by providing more equitable opportunities and by promoting and protecting their human rights"*.

It calls for the full and coordinated involvement of all levels of society: community, intermediate and national. It seeks the integration and intervention of all relevant sectors - educational, health, legislative, social and vocational - and aims at the full representation and empowerment of disabled people. CBR should be sustained in each country by using a level of resources that is realistic and maintainable.

Referral services are needed to cater to those disabled people who need more specialized interventions than the community can provide. There are certain interventions which require medical specialists, para-medical professionals or the services of rehabilitation personnel. These services necessitate the involvement of professionals as all skills cannot be transferred to community volunteers or the family.

3.4.4 Comprehensive Definition : *"CBR is a goal-oriented, individual need based, cost effective and result-oriented strategy of providing time bound and appropriate services within the community, with its active participation, involvement and with fullest use of its resources. CBR strategy aims at confidence building of the community, bringing out efficiency of individual and promoting active participation, involvement and integration of the individual in community life. It seeks community participation at the planning, execution, management and monitoring of CBR programme. It ensure community's support to protection of human rights, equal participation, equity, social justice, equal participation and complete development of the individual".*

3.5 Characteristics of CBR

Experience gained in various countries confirms the importance of integrating the CBR services into primary health care. The level of integration, however, is dependent upon availability of medical and non-medical personnel in the community. CBR is a creative application of primary health care approach in rehabilitation services. It involves measures taken at community level to use and build on the resources of the community, including the persons with disabilities themselves, their families and their community as a whole. The following characteristics are common to CBR programmes (Wadhwa, 1998):

- To establish the local communities to create awareness about persons with disabilities, recognize their rights and accept at least part of responsibility for their rehabilitation.
- To motivate the local communities to mobilize their own resources - human, material and financial, including persons with disabilities themselves, their families and friends to take an active part in rehabilitation training.
- To organize training for personnel at different levels and to use appropriate training material.

- To deliver services built upon existing community, organizational infrastructure, especially primary health care services.
- To establish a referral network to meet needs which cannot be met locally and work in conjunction with other sectors viz. education, vocational, employment etc.
- To ensure strong political commitment for the promotion of CBR.

As such, CBR is an integrated rehabilitation programme based on trained community action with appropriate referral support at all levels of national health infrastructure. Similarly, transfer of skills and technology is the most important step for CBR to succeed.

3.6 Understanding CBR

The basic concept inherent in the multi-sectoral approach to CBR is the decentralization of responsibility and resources, both human and financial, to community level organizations. In CBR approach, governmental and non-governmental, institutional and outreach rehabilitation services must support community initiatives and organizations.

3.6.1 Multi-sectoral Approach: The Working Group on CBR (1997) considers that the starting point for understanding CBR is the following approach agreed to in 1994 by ILO, UNESCO and WHO:

"CBR is a strategy within community development for rehabilitation, equalization of opportunities and social integration of all people with disabilities. CBR is implemented through the combined efforts of persons with disabilities themselves, their families and communities, and the appropriate health, education, vocational and social services".

This approach to CBR is multi-sectoral and includes all Governmental and non-Governmental services that provide assistance to persons with disabilities are not traditionally

considered relevant to CBR programmes and persons with disabilities. Examples include community developmental organizations, agricultural extension services and water and sanitation programmes.

3.6.2 CBR Programme Criteria: The CBR Working Group (1997) has proposed 7 following criteria for the development and implementation of CBR programmes:

a. People with disabilities should be included in CBR programmes at all stages and level, including initial programme design and implementation.

b. The primary objective of CBR programme activities should be the improvement of the quality of life of people with disabilities.

c. One focus of CBR programme activities is working with community to create positive attitudes towards people with disabilities and to motivate community. members to support and participate in CBR activities.

d. The other focus of CBR programmes is providing assistance for people with all disabilities; and for people of all ages, including older people.

e. All activities in CBR programmes should be sensitive to the situation of girls and women.

f. CBR programmes must be flexible so that they can operate at the local level and within the context of local conditions.

g. CBR programmes must coordinate service delivery at the local level. As far as possible, services should be available at the local level in a comprehensive manner. These services may include medical intervention, education & training, provision for income generation, care facilities and prevention of causes of disabilities.

The CBR Working Group (1997) advocates provision of specialized outside services, comprehensive package of services and its delivery at the local level with the active involvement and participation of community at all level of planning, implementation, management, monitoring and evaluation.

3.6.3 Outcome of CBR: CBR programme should restore the functioning and participation of the individual to the normal level. It should grant equitable opportunities of social integration, participation and progress in the normal stream of social life.

The CBR should enable the individual:

● to stay within the fold of the family and contribute towards the family income.

● to function and perform as he used to function and perform prior to disability, that is restoring the fullest use of the senses to compensate for the loss of vision.

In other words, CBR programme is goal-oriented, need-based, time bound activity which envisages community participation, ensures use of community resources and brings out fullest efficiency of the individual in a cost effective and environment friendly manner, that too within the community.

3.7 Extent of Coverage

From the experience of implementing CBR programmes exclusively for the visually impaired persons at 130 locations in India, it has been established that a group of 8 Field Workers, 2 Itinerant Teachers and one Supervisor can easily cover 200 visually impaired persons in one block or population of 2,00,000 within a period of two years.

It has also been established that the per capita cost of such services is less than Rs.1500 which is one-tenth as compared to institutional programmes. Thus CBR is the only alternative available at present for the comprehensive rehabilitation of the visually impaired, particularly in the developing countries.

The components, technical transfer of skills, training of fuctionaries, appropriate strategy and coverage of CBR is still a matter of debate. Every CBR agency has a tailor made approach which is designed to meet the needs of that particular region.

3.8 Components of CBR

Due to cost constraint, commonality of services, scattered target group and State policy, it is essential that the CBR should:

a. cover persons of all age groups
b. be cost effective and result oriented
c. be realistic and need-based
d. be in consonance with the State policy
e. include all aspects of:
    ● prevention and cure of curable blindness
    ● certification of incurable blindness
    ● social integration
    ● integrated education
    ● economic rehabilitation
    ● support services and concessions
    ● advocacy for the rights of persons with disabilities
    ● acting as a pressure group for influencing State policies
    ● community empowerment and participation
    ● use of community resources

3.9 CBR Service Spectrum

CBR programme for the visually impaired should encompass all aspects of prevention, cure, rehabilitation, child preparatory services, integrated education, and support services. The nature of services, however, would vary with the type of target group as listed below:

3.9.1 For the General Population

a. Eye check-up
b. Child screening
c. Refraction

d. Public awareness
e. General health care

3.9.2 For Curable Visually Impaired

a. Diagnosis
b. Eye treatment
c. Eye surgeries
d. Provision of glasses, low vision aids, etc.
e. Follow-up

3.9.3 For Incurable Visually Impaired

a. Identification
b. Eye check-up
c. Certificate of visual impairment
d. Individual assessment
e. Individual counselling and family counselling
f. Provision of training in:

    ● orientation & mobility
    ● activities of daily living
    ● home economics

g. Social integration
h. Integrated education
i. Economic rehabilitation
j. Support services and concessions
k. Community awareness and involvement
m. Advocacy, counselling and empowerment

In the case of medical rehabilitation,the CBR programme should confine its role in referral in the respective specialist agencies. The integrated education is handled by Itinerant Teachers by admitting children to accredited educational institutes in the same village preferably. Similarly, prevention and cure activities are exclusively handled by the Ophthalmic Surgeons or Eye Hospitals or such other institutions.

3.10 Range of Services under CBR

CBR programme should aim at providing individual need based services to the general public, persons with eye problems and the incurable visually impaired. The project will extend all services which will result into public awareness, prevention and cure of visual impairment and complete rehabilitation of the visually impaired.

a. Identification of the visually impaired and their felt needs.
b. Providing services of O&M and activities of daily living.
c. Encouraging eye care agencies to provide eye care services.
d. Promoting integrated education for visually impaired children.
e. Counselling the parents and creating public awareness.
f. Involving other developmental agencies in service delivery.
g. Ensuring economic rehabilitation.
h. Providing work counselling to facilitate their self-employment.
i. Enabling them to avail various concessions and benefits.
j. Creating awareness about the rights of the disabled, legal advise, creation of self-help groups.

4. Organizational Structure

The organizational structure of the CBR programme should be a simple linear one without overlapping of responsibilities. It has been divided into three tiers because of the following advantages:

a. Developing a national network of services for the target group.

b. Enabling extensive coverage of the target group.
c. Providing essential local contacts and effective supervision.
d. Ensuring involvement of other developmental agencies.
e. Offering decentralized supervision
f. Organizing centralized monitoring, coordination and evaluation
g. Understanding of local environment, language and traditions.
h. Promoting comprehensive services in remote areas.

The envisaged organizational structure is depicted below:

Funding Agency
|
Central Coordinating Agency
|
Project Implementing Agency
|
Project Coordinator
(Only in case of a District level CBR Project)

Itinerant Teacher (2)   **Project Supervisor (1)**

Field Workers (8)
(For each Block or Taluka or Tehsil)

4.1 Tier I: Role of Funding Agency :

a. Providing financial assistance for admissible expenditure.
b. Providing technical inputs for implementation of the project.
c. Providing consultative inputs and services of experts.
d. Analyzing and providing feed-back on progress reports.

e. Mobilizing resources for the expansion of the projects.
f. Convincing other developmental agencies to adopt CBR projects.
g. Creating public and institutional awareness
h. Convincing the Government to encourage and finance such projects.
i. Periodic evaluation of the projects through suitable means.

Thus the Funding Agencies will not only provide financial assistance but shall monitor and evaluate progress of the projects.

4.2 TierII: Central Coordinating Office (CCO)

a. Sending project proposals and mobilizing resources.
b. Identification of project locations and implementing agencies.
c. Helping in selection and training of the field staff
d. Liaison between the funding and implementing agencies.
e. Formulating policy guidelines for ensuring:

- proper implementation;
- monitoring and evaluation of the projects;
- securing regular reports from implementing agencies; and
- submit reports to the funding agencies.

f. Implementing recommendations of the funding agencies.
g. Organizing training of the supervisors and other officials.
h. Creating appropriate public awareness through mass media.
i. Motivating other organizations to implement such projects.
j. Mobilizing resources for the expansion of the project.
k. Promoting networking among pro-CBR organizations.

l. Disseminating information and creating a database.
m. Organizing seminars for popularizing the concept of CBR.
n. Encouraging standardization of course curricula, development of training material and publication of material.

4.3 Tier III: Project ImplementingAgency

As per the project ideology, the CBR project is implemented by a local organization working for the visually impaired, rural development, social development organization, service club, or a group of motivated individuals.

4.3.1 Legal Status:It should be a registered under

- Public Trust Act, or
- Indian Society Registration Act, 1860
- Section 25 of the Indian Company's Act.
- Foreign Contributions Regulation Act, 1983
- Section 51 of Persons with Disabilities Act, 1995
- Section 12 of the Income Tax Act, 1961

It should have a duly constituted, functional and democratic Managing Committee or Governing Board as per its constitution. It should maintain regular accounts, getting the same audited and fulfilling such other statutory requirement.

4.3.2 Nature of Implementing Agencies

- State Branch of the National Association for the Blind
- Blind welfare agency
- Disabled welfare agency
- Eye Hospital or local hospital
- Rural development agency
- Social welfare organization
- Service clubs

- Educational institutions
- Local administration
- Prominent social worker

4.3.3 Required Characteristics

a. Sound track record of rehabilitation or development work.
b. Willing to promote CBR and avail local support for eye care.
c. Adequate infrastructure like office, telephone and vehicles etc.
d. Experience of working in rural areas or for disabled persons.
e. Dynamic management and willing to implement new projects.
f. Good contacts with health and eye care agencies, development administration and community leaders.
g. Sound financial position to ensure expansion of the project.
h. Willing to assign personnel to manage the project.

4.3.4 Roles of Project Implementing Agency: This Agency will implement the project and perform the following responsibilities:

4.3.4.1 As An Administrator

a. Providing services of Project Director and other staff.
b. Providing establishment, conveyance, and office infrastructure.
c. Following guidelines set by the Central Coordinating Office
d. Maintaining strict adherence to budgeted heads.
e. Selecting project area, forming clusters, selecting field staff

f. Organizing training, assigning work to the field team.
g. Organizing weekly review meetings.
h. Arranging supervision of the working ofthe field staff.
i. Ensuring proper utilization of the project vehicles.
j. Sending regular physical and financial reports to CCO.
k. Involving Panchayat, district and development administration.
l. Tapping local media for creating public awareness.
m. Encouraging other agencies to take up CBR projects.

4.3.4.2 As a Change Agent

a. Approaching health authorities to provide health care.
b. Arranging eye screening and eye-checkup for complete population
c. Ensuring admission of visually impaired children to village schools.
d. Arranging services of Itinerant Teachers such for children
e. Providing them braille and educational material.
f. Creating public awareness about achievements of the project.
g. Ensuring continuity of the project on completion of funding.
h. Developing local leaders for the cause.
i. Adapting philosophy to suit the local conditions.
j. Networking with other agencies for mutual sharing of expertise

4.3.4.3 As a Resource Mobilizer

a. Mobilizing community resources needed for economic resettlement.
b. Raising funds for need-based items viz. white canes, braille aids

4.3.4.4 As a Human Being

a. Winning confidence and seeking involvement of the field staff.
b. Having a genuine concern and devotion for the visually impaired.
c. Building rapport and solving the problems of the field staff.
d. Being patient with field staff and the visually impaired alike.
e. Motivating field staff in the faces of conflicting situations.

4.4 Tier IV: Field Staff

4.4.1 Field Workers: It is essential to provide appropriate rehabilitation services at the door step as per individual felt needs of the beneficiaries. For this purpose, a team of eight Field Workers is required.

4.4.2 Itinerant Teacher: As integrated education requires specialist inputs, it should be handled by qualified Itinerant Teachers. As one such teacher is required for 8 children, the number of teachers would depend upon the number of school-age children identified and enrolled in the regular schools in the project area.

4.4.3 Field Team: The field team for each block would thus consist of one Project Supervisor, two Itinerant Teachers and eight Field Workers.

4.4.4 Project Coordinator: Wherever the Project Implementing Agency plans to cover all the blocks in a district in a phased manner with four blocks at any point of time, appointment of a Project Coordinator is essential. Such a Coordinator would coordinate functioning of all the field teams, organize training, monitor progress and evaluate performance.

5. CBR Implementation Process

The CBR Process Chart reflects the envisaged sequence of activities, responsibility areas and various aspects of rehabilitation. To maintain uniformity in the approach, a standard CBR Process Chart has been evolved. This may, however, be modified depending upon the geographical terrain, socio-economic conditions of the project area, nature of the Project Implementing Agency, extent of availability of different services and such other factors.

The CBR Process Chart is presented in a sequential form indicating the steps to be followed. The most important stages include appointment of a agency, selection and training of field staff, survey of the curable and incurable visually impaired persons, referral of curable persons to eye care agencies, extension of services of social integration and dividing all the incurable persons into three groups viz. the children for integrated education, the adults for economic rehabilitation and the aged for social rehabilitation.

6. Appointment of a Project Implementing Agency

6.1 Need for Implementing Agency

The implementation of the project would require coordination at the block level in remote areas. It is not possible for any national or regional level urban based organization to implement such a project effectively without the involvement of local organizations. The local agency is known and accepted in the area and is familiar with local customs, traditions and habits. Moreover, after the project funding is complete, this agency looks after the propagation of the project and fulfills the principles of sustainability and permanency.

The experience of implementing CBR projects at 134 locations in India reveals that it is not necessary to depend only upon the development organizations for the visually impaired for the implementation of such projects. Local level rural development organizations, local eye hospitals, health care agencies and educational institutes have also proved very effective in this respect, as these organizations have effectively networked rehabilitation work with their existing services.

CBR PROCESS

Selection of a Project Area & Appointment of Project Implementing Agency

Cluster formation

Selection of Field Staff		
Supervisor	2Teachers	8F. Workers

Training of Staff	
Field Staff	Teachers

Door to Door Survey	
Visually Impaired	Persons with Eye Problems

Eye Screening by Ophthalmic Surgeon

Incurable Visually Impaired		Curable Person
Blindness Certificate		

Initial Assessment in a Prescribed Format		Eye Treatment & Cure

Social Integration		
O & M	ADL	Counselling

General Concessions		
Travel	Monetary Assistance	Any Other

Educable Children Below 8 Yrs. of Age	Economic Rehabilitation Group	Social Rehabilitation Group

School Admission
Pre-Braille Activities
Counselling

Family Counselling
Identification of Trade
Training, Support Services
Launching Grant/ Subsidy

Family
Counselling
Health Care
Pension

(Itinerant Teachers)   (Field Workers)   (Field Workers)

Project Supervisor

6.2 Selection Process

The following procedure should be followed for selecting the project implementing agencies:

a. Select a tentative location for project implementation.
b. Identify a suitable agency after compiling information.
c. Explain project ideology and role performance to the agency.
d. Invite a project proposal based on the project guidelines.
e. Depute the Project Coordinators to verify the details.
f. Forward the project proposal to the Funding Agency.
g. Send all relevant materials to the selected agency.
h. Depute appropriate staff for initiating the project.

6.3 Selection of Project Area

The parameters for selecting the area are enumerated below:

a. Predominantly rural area
b. Remoteness of the area (20 k.ms. or more from a city or town)
c. Backwardness of the area - The parameters for classifying an area as backward are:
   ● Low per capita income (below national average)
   ● Low literacy rate (below 40 percent)
   ● Drought proneness of area
   ● Low irrigation facilities
   ● Large percentage of dry land
   ● Paucity of medical facilities
d. Existence of a rural-based hospital or a development agency
e. Higher prevalence and incidence rate of visual impairment of more than 525 and 25 respectively in the area.

e. Availabilityoftransport facilities

f. High density of population results in a comparatively lower cost of reaching the rural visually impaired. The density of persons per square kilo-meter should ideally be 300 or more.

6.4 Formation of Clusters

Once the project area has been selected, the entire area should be divided into groups of villages.

6.4.1 Geographical Layout: Obtain a road map and a list of villages of the rural area from any of the following sources:

a. Public Works Department
b. Taluka Development Office
c. District Collector's Office
d. District Panchayat Office
e. District Education Office
e. A local publisher of area maps

Use the location code of the villages, which indicates proximity between the villages, as a guideline for the formation of the clusters.

6.4.2 Formation of Clusters: Club the nearby 10-12 villages or Panchayats based on proximity of villages and geographical locations for the formation of the clusters. Thus the entire taluka/tehsil should preferably be divided into eight clusters.

6.4.3 Central Village: In each cluster, locate one main central village which preferably should have:

a. A post office
b. Bus facility
c. Population of 8,000-10,000 persons
d. A high school
e. Rural health centre
g. Rural development, land development or a cooperative bank
h. Producer cooperative society etc.

Name the cluster after that main village. Eight clusters can be taken up at any point of time as the project provides for eight Field Workers.

7. Selection of Field Staff

Table: Project staff

S. N.	Designation	No.	Qualification
1.	Project Director	1	Honorary Worker of Implementing Agency
2.	Joint Director	1	-do-
3.	Supervisor	1	Graduate with relevant experience
4.	Field Worker	8	Secondary pass, needy, enthusiastic and dynamic persons from the project area
5.	Itinerant Teacher	2	Graduate withteacher training course

The services of the Project Director and Joint Director will be provided by the Project Implementing Agency on an honorary basis. The last three categories of personnel will be paid workers who will work exclusively for the project.

The surest way to ensure success of the project is to take the Field Workers from the target area itself. The Field Workers should be sons of the soil, with high school education, young, socially conscious men and women, who have returned to their villages to work. Select two Field Workers from any village of each cluster. The Itinerant Teachers should be recruited from the project area itself.

7.1 Inviting Applications

To select the Field Workers from the project area itself, create awareness in the area by:

a. Approaching the *Sarpanch* and the school headmaster/ teachers.
b. Contacting opinion leaders of the villages.
c. Collecting addresses from the local schools of the students who have completed their secondary school education recently.
d. Meeting the rural youth in the area.
e. Involving volunteers of the rural development agencies.
f. Putting a notice on the village notice board, school notice board, or at the entrance to the village temple.

The Project Implementing Agency should screen and invite suitable candidates for an interview at the head-quarters of the Project Implementing Agency. Representatives of the Central Coordinating Office may also be present at the interview.

7.2 Criteria for Selection

Since the target is to select 16 Field Workers and one Supervisor, a minimum of 80-90 applications are needed to arrive at the best in the lot. Select suitable candidates based on the following criteria:

a. *Age*: As the project involves a lot of travelling, prefer applicants below 30 years of age who can ride a bicycle.

b. *Education*: As the Field Workers are expected to prepare progress reports, maintain accounts, and train the rural visually impaired, consider only those applicants who have successfully cleared the secondary school examination.

c. *Residence*: Consider only those applicants who come from the project area, preferably from the central village of the respective cluster.

d. *Training*: Prefer those who have undertaken some training or have work experience in rural crafts.

e. *Aptitude*: Consider only those applicants who are willing to join the job out of interest and are interested in the field work. For this purpose, test social consciousness and awareness by several aptitude, interest, and personality development tests.

f. *Caste consideration*: Consider only those applicants who do not believe in the caste system and are willing to work for visually impaired persons from all casts, creeds and religions.

g. *Gender*: Select female workers also as they would be useful for extending services to the female beneficiaries coming from conservative families where access to a male Field Worker may not be permissible.

h. *Oratory*: As the Field Workers are required to provide information to the community and do a lot of talking, prefer persons who are good orators.

7.3 Rationale for Selecting Two Candidates from Each Area

Select two persons from each cluster for the purpose of training. One of them is dropped on completion of training and the second one is retained as the Field Worker. The rationale for selecting two candidates is given below:

a. *Stand by*: As the training is very intensive, should the selected candidate leave half-way, the second one can be absorbed in his or her place without affecting the project.

b. *Cost*: As organizing training is very expensive, it cannot be organized again and again. If one candidate

leaves halfway organizing training for the replacement may not be feasible due to cost constraints.

c. *Economical*: As training costs viz. remuneration to experts and cost of literature would have to be borne irrespective of the number of persons to be trained, it is thus more beneficial to train larger number of persons.

d. *Sense of competition*: Due to sense of competition, each worker would be motivated to put his best efforts, remain alert and assimilate as much information as possible.

e. *Wider choice*: A choice is available and open to the agency to chose one worker. Otherwise, it would have to continue with the selected one even if found unfit for the work during training.

f. *Inventory for expansion*: For expansion of the project for other categories of disabilities, the stand by candidates would be easily available.

7.4 Importance of Proper Selection and Training of Field Staff

The field staff should be judiciously selected and properly trained. In a field project, one has to completely rely and depend upon the Field Workers to work and deliver services according to prescribed guidelines. As the Project Directors or Project Supervisor can not physically check the daily working of each Field Worker, much has to be understood from the Field Worker's reports. It is these Field Workers who can thus make or break a project. Every Project Implementing Agency must ensure that the field staff remains motivated and interested in the work.

7.5 Inputs for Imparting Training to the Field Staff

a. Select the appropriate location.
b. Provide class-room and other facilities for theory classes.
c. Identify rural area for field training.
d. Provide background material, stationery and other such items.
e. Arrange lectures and the local faculty.
f. Provide equipment for the audio-video presentation.
g. Arrange boarding and lodging for trainees and the faculty.
h. Arrange visits to visually impaired welfare organizations.
i. Arrange visits to eye hospitals for ophthalmic orientation.
j. Organize the training material.
k. Monitor progress of training.
l. Undertake periodical evaluation and examination.
m. Keep appropriate records of performance of trainees.
n. Select the field workers on completion of training.

7.6 Role of Central Coordinating Office (CCO) in Training

a. Evolve and finalize training philosophy and approach.
b. Prepare the training schedule.
c. Decide the place and timing of the training.
d. Decide the training curricula and training method.
e. Decide the extent of application of training devices.
f. Assist in selecting the local faculty.
g. Orient the local faculty.
h. Arrange for the visiting faculty.
i. Organize training material, reference material etc.
j. Assist in organizing field visits to successful projects.
k. Provide services of a Project Coordinator during training.

l. Devise methods for evaluating the trainees.

m. Evaluate performance of the trainees.

n. Evaluate the effectiveness of the programme.

o. Assist in the final selection of the Field Workers.

p. Ensure cost effectiveness of the programme.

q. Determine the extent and duration of the refresher courses.

7.7 Course Curriculum

The six-week training consists of class-room instructions and theoretical training for three hours every day followed by three hours of practical training under blindfold. The content of the training programme is given below:

- Historical background of services for the visually impaired
- Need for implementation and promotion of CBR
- Demographic details of the visually impaired
- Definition and type of visual impairment
- Physiology and anatomy of eye
- Causes and symptoms of visual impairment
- Introduction to eye care
- Introduction to low vision and low vision aids
- Psychological implications of visual impairment
- Importance and consequences of rehabilitation
- Models of rehabilitation, their merits and demerits
- Survey methods
- Definition and philosophy of CBR
- Aims and objectives of CBR
- Components of CBR
- Methodology of CBR
- Organizational structure of the project
- Roles of Funding Agency, Project Implementing Agency

- Need for involvement of local agencies
- Role and responsibilities of the Field Workers
- Concept and components of social rehabilitation
- Importance of orientation and mobility
- Techniques, methods, process of O&M and mobility aids
- Importance and techniques of daily living skills
- Need and importance of parent counselling
- Need for community involvement in rehabilitation process
- Models of education of the visually impaired
- Introduction to integrated education
- Introduction to braille
- Components of integrated education
- Concessions available to the visually impaired
- Process of economic rehabilitation and its importance
- Introduction to various inputs of economic rehabilitation
- General introduction to agriculture, crafts, and trades
- General introduction to loan and subsidy schemes
- Need and importance of reporting, formats of reporting
- Monitoring and evaluation of the project
- Case closure and concept of complete rehabilitation
- Presentation of case studies and case closure

The training should include theoretical topics reinforced by practicals demonstrations and field visits etc.

7.8 Nature of Faculty

For conducting the training, the following faculty is required.

7.8.1 Local faculty: For all the topics which are of generic nature and which aim at imparting area specific training, involve the following local faculty:

a. Psychologist
b. Qualified Social Worker
c. Braille Instructor
d. Craft Instructor
e. Ophthalmologist
f. Resource persons from leading voluntary agencies
g. Representative of Department of Social Welfare
h. Representative of Financial Institutes
i. Representative of Rural Development Agencies
j. Representative of local administration
k. Specialist in agriculture, dairying or other local agro-based activities

7.8.2 Visiting faculty: Invite the visiting faculty only for the specialized topics for which the faculty may not be available locally. The Central Coordinating Office generally arranges the following visiting faculty:

a. Orientation & Mobility Instructor
b. Instructor in Activities of Daily Living
c. CBR Professional
d. Qualified Social Worker for survey methods
e. Special Teacher of the visually impaired
f. Instructor on record maintenance & reporting formats
g. Resource persons from national institutes/ organizations

7.9 Training Methodology

a. *Emphasis on case studies*: Use the case method for both illustrating the principles of rehabilitation and encouraging the trainees to come forward with solutions to problem situations.

b. *Distribute material*: Ask the lecturers to prepare a note on their subject. Cyclostyle and circulate the same among the trainees in advance.

c. *Revision sessions*: Every night, an officer of the Project Implementing Agency and the Chief Officer (Rural Rehabilitation)   should, together with the trainees revise the topics taught during the day and to help the trainees to improve their grasp of the subject.

d. *Emphasis on class participation*: Encourage the trainees to participate actively during the lectures and to ask questions regarding their difficulties. Their participation will help to reflect the abilities of each person.

e. *Home assignments*: Give the Field Workers simple home assignments to develop their skills of written analysis and communication. Give an assignment like *"My experience on wearing a blindfold"*. A group of two trainees should be entrusted the responsibility of preparing the summary of day's lecture and the same should be presented the next day. Every day a new group should be assigned this responsibility.

f. *Periodic evaluation*: Evaluate the trainees every week to gauge their progress. Periodically hold small tests in theory and practicals. Maintain the record of their attendance to establish their regularity.

g. *Variety in teaching methods*: Incorporate variety in teaching methods to hold the interest of the trainees. The suggested methods are group discussion, case studies, presentation, role play etc.

h. *Field practicals*: In the course of training, the trainees should be taken to a nearby village to conduct practicals on survey methods, approaching the families and filling up the initial survey forms.

i. *Simulation Methods*: Use simulation methods, that is experience of various disabilities, role playing

to understand disability, enacting different situations, blind fold experiences etc.

8. Identification of Target Group

8.1 Sources

The following sources may be exploited for identification of the visually impaired in the rural areas:

a. *Village school*: Approach school authorities for getting an idea of the number of persons with eye problems or visual impairment.

b. *Village Panchayat*: This office has documents related to the village statistics and information regarding socio-economic conditions of all the persons including the visually impaired.

c. *Opinion leaders*: As they influence affairs pertaining to village life, seek their help in getting information regarding the target group.

d. *Display at religious places*: As such places have a great hold on the lives of the rural populace, display notices at such places to elicit information regarding the target group.

e. *Door-to-door survey*: As door-to-door survey is the most fool-proof method of identifying the target group, visit every house for this purpose.

f. *Beneficiaries themselves*: Once a visually impaired person has been identified, he/she would be able to give details of other such persons in the village.

g. *Other development agencies* such as youth clubs, women groups, cooperative societies, *Khadi* units, village school, hospital or dispensary and rural development agencies should be approached for eliciting information regarding the target group.

8.2 Door-to-Door Survey

After completion of six weeks training, the Field Workers should be assigned their respective clusters for work. They should survey each household in the respective cluster and complete the prescribed proforma with the following details:

a. Name of village
b. Name and address of the head of the family
c. Name, sex and age of the persons with eye problems.

8.3 Eye Screening

It is essential that every person with an eye problem or who complains of loss of vision of any degree be examined by a qualified Ophthalmologist (not by the Field Worker) or an Ophthalmic Assistant. Such ophthalmic personnel would record the information in the prescribed vision screening proforma dividing all the persons identified during the door-to-door survey into curable and incurable categories.

The curable visually impaired persons should be taken up for further treatment, whereas the incurably visually impaired person should be certified thus.

8.4 Baseline Data

Based on the door-to-door survey and eye screening by the ophthalmic personnel, prepare baseline data sheets for the curable as well as incurable visually impaired persons.

a. *Curable cases*: The baseline data for curable cases would enlist information as regards name, address, sex and age of individual, date of screening, recommendation of ophthalmologist and the action taken for eye treatment, refraction or surgery, follow up etc.

b. *Incurable cases*: Apart from personal details, the baseline data in this category would enlist information

on age of on-set and cause of blindness and the treatment availed etc.

c. *Summary Baseline Data*: Based on statistical information enlisted in proforma on Baseline Data-Curable cases and proforma on Baseline Data -Incurable cases, prepare a summary of baseline data enlisting male and female curable as well as incurable persons identified in each age group ranging from 0-4 to 65 & above. This proforma will enable the project implementing agency to plan delivery of services for the respective age groups.

8.5 Eye Care

The project should organize referral services for general population in respect of eye check-up, child screening, refraction, public awareness and general health care. Similarly, it is required to promote referral services for curable visually impaired in respect of diagnosis, eye treatment, eye surgeries, and provision of glasses, low vision aids, etc. After preparing baseline data on curable blindness, the project should extend the following services:

8.5.1 Organizing Eye Camps: Collaborate with an eye hospital for holding eye camps to ensure that every person having eye trouble in the project area is checked up. This check-up and further surgical intervention or other treatment can be effectively done through an eye camp. Since the project has a field staff throughout the area, there will be synergy in operations. The funds for eye camps should be raised from service clubs, Government health departments, or from funding agencies.

The National Programme for the Control of Blindness (NPCB), Director General of Health Services, Ministry of Health has initiated District Blindness Control Societies (DBCS) in almost all districts in most States in the country. As the major objective of these societies is prevention and cure of blindness, this infrastructure may be tapped for organizing eye screening and

eye surgeries. Generally, District Collector of a respective district who is the Chairman of the DBCS should be approached for this purpose.

8.5.2 Importance of Involving Eye Hospitals: The NAB RAC's experience of implementing CBR at 134 locations in India reveals that involvement of eye hospitals or eye specialists is essential for effective project implementation. In fact, wherever the Project Implementing Agency is a rural eye hospital, the results have been very encouraging. As eye hospitals enjoy better social acceptance than a rehabilitation organization, the whole concept is easily accepted by the beneficiaries.

8.5.3 Role of Field Staff: For the purpose of prevention and cure of visual impairment, the role of field staff should be limited to:

a. Identification persons with eye-ailments or vision defects.
b. Referral of such cases to a qualified ophthalmologist.
c. Acting as a link between the individuals and care specialists.
d. Acting as a motivator and guide.
e. Doing follow up of such cases.

8.5.4 Cure of Visual Impairment Process
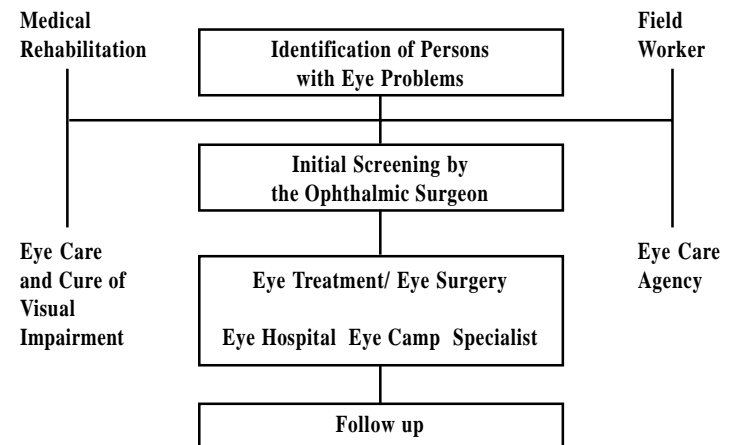
8.5.5 Certification of Incurable Visual Impairment: Ensure that every visually impaired or low vision person identified in the project area is checked-up by a qualified Ophthalmologist. Experience has proved that a significant percentage of "visually impaired" persons can regain sight through surgical intervention.

It is essential that every incurable visually impaired person be certified by the appropriate authority as a visually impaired person. Such a certificate is essential for availing the travel concessions, scholarship, pension or any other social security benefits or facilities etc.

Such certificate should be issued in the prescribed proforma. As per the recently enacted "Persons with Disabilities Act, 1995", the disability certificate has to be issued by a "Medical Board" duly constituted by the State Government. In many States, such disability certificate is issued by the Civil Surgeon on the recommendation of the Ophthalmologist.

9. Extension of Services

After undertaking the door-to-door survey of the curable as well as incurable visually impaired persons in the clusters assigned, the Field Worker should carry out work as per the details given below:

9.1 Role of Field Worker

The Field Worker is the key functionary in the project. He or she has direct contact with the beneficiary. The success of the project depends upon performance, integrity, sincerity and devotion of the worker. The Field Worker is expected to perform the following functions:

9.1.1 Identification: The Field Worker should use the following proforma for identification of the target group:

    a. Door-to-door survey in the prescribed format
    b. Vision screening by ophthalmic personnel

    c. Summary of vision screening
    b. Baseline data in the prescribed format
      ● Curable cases
      ● Incurable cases
      ● Summary of baseline data
    c. Individual case file for each case
    d. Initial assessment form

9.1.2 Complete Proforma: Apart from various proforma used for identification of the target group, the Field Worker should also complete the following proforma:

    a. Daily Diary
    b. Weekly Visit Proforma

9.1.3 Extension of Direct Services:

    a. Select and provide services to five cases at any point of time
    b. Schedule of services in the following sequence:
      ● Individual and family counselling
      ● Orientation & mobility
      ● Daily living skills and home economics
      ● Training in household work (for women)
      ● Concessions and facilities
      ● Training in rural crafts, household activities
      ● Monetary assistance as subsidy, launching grant etc.
      ● Any other need based services
    c. Seek community participation in all these activities
    d. Involve local administration in all the relevant activities
    e. Create public awareness about the project and achievements

9.1.4 Referral Services: Refer all the persons:

● with eye ailments to local eye care agency
● school age to the integrated education programmes.
● with other disabilities to concerned agencies.
● with multiple disabilities and deafblindness to residential institutes or programmes devoted to such persons.

9.2 Establishing Contact

The Field Worker should observe the following procedure of establishing contacts with the beneficiaries:

a. *Counselling*: Approach visually impaired person and his family and convince them of his or her potentials

b. *Introduction of self & agency*: Give a brief introduction of the project, Project Implementing Agency and himself.

c. *Explain the aims and objectives* of the project and purpose of the visit to the home of the person.

d. *Give illustrations* of successful cases of complete rehabilitation usingvisual aids and the print materials.

e. *Convince the family* that the visually impaired person can do meaningful work and   be independent by demonstration of work under blind-fold and giving relevant examples and information.

f. Understand the socio-economic environment of individual.

9.3 Completing Initial Assessment Form

The Field Worker is required to complete the Initial Assessment Proforma for each incurable visually impaired person. He/she needs to compile the following details pertaining to the visually impaired person, his/her family and socio-economic environment:

a. Personal details of name, address, age, sex, marital status, religion, caste, etc.
b. Details of on-set of visual impairment, cause, nature and extent of visual impairment, nature of treatment, certification etc.
c. Level of training, education, experience in craft etc.
d. Details of family in terms of other such incidence, family occupation, income and number of family members.
e. Extent of dependence in respect of mobility, self care, daily living skills, social acceptance and economic aspects.
f. Availability of concessions and facilities.
g. Economic status of the individual.
h. Willingness of the individual to avail training.

The Field Worker must complete this proforma for every visually impaired person. The details should be verified by the Supervisor and the Project Director. This assessment should serve as a base for the planning of further extension of services.

9.4 Assignment of Initial Cases

The Project Director will collect the Initial Assessment Proforma and assign five beneficiaries for service delivery to each Field Worker. As a Field Worker is required to put in eight hours of field work daily, he/she can put in one and half hours for each beneficiary. These five cases should be selected on the basis of following criteria:

9.4.1 Proximity of Cases: The Field Worker would be able to effectively handle the cases if they are in proximity to each other. It would be best to first take up such persons in the Field Worker's own village as this helps him to begin in familiar surroundings.

9.4.2 Age-mix of Persons: To make an immediate impact, visually impaired persons from different age groups should be taken up first. Successful rehabilitation of these cases will have a demonstration effect and convince the villagers and other such persons of the bonafides of the project.

9.4.3 Taking up Challenging Cases: The challenging cases as given below should be taken up first:

- Persons who acquired visual impairment recently
- Young children
- Visually impaired housewives
- Persons in the working age group
- Educated persons

9.5 Scheduling of Services

On the basis of the individual felt needs of each visually impaired person, the Field Workers should prepare an individual plan for each person under the guidance of the Project Supervisor. The services should be provided in the following sequence:

9.5.1SocialIntegration

- Training in orientation and mobility
- Training in activities of daily living
- Training in home economics particularly for females
- Family and individual counselling

9.5.2 Concessions: All visually impaired persons according to their eligibility should be provided the following concessions:

- Bus concession
- Railway concession
- Old age or disability pension
- Scholarship (in case of children)
- Monetary assistance like subsidy, launching grant etc.
- Other concession or facilities available in the area

9.5.3 Age-specific Services: After extending services of social integration and concessions to all the persons irrespective of age, further services should be extended as per age of the person:

- Integrated education for school age children (age 5 to 12 years)
- Economic rehabilitation for working age (18 to 65 years)
- Social rehabilitation for persons above 65 years age

9.5.4 Continue Rehabilitation Services: When any case, out of these five cases is completed and rehabilitated completely according to his expressed needs, take up another case immediately. Do not wait for all first five cases to be completed to take up another set of five cases. The training must be a continuous process. The Field Worker must have at least five persons always who are being imparted individual need based training while ensuring follow-up of other cases.

While individualized services are being given, the other CBR services like filling of pension forms, community involvement, provision of assistive devices should go on also.

10. Social Integration and Concessions

Every incurable visually impaired person should be provided individual need based services of social integration as listed earlier. The nature of services would depend upon the age of the individual, sex, age of on-set of visual impairment, level of any earlier training and potential of the individual.

Most visually impaired persons need training in activities of daily living, orientation and mobility and personal grooming to be independent. The following services should be provided according to the felt-needs of the individual:

- Individual counselling
- Parent counselling

- Orientation & mobility training
- Daily living skills training
- Training in social graces and etiquette
- Vocational or occupational training
- Communication skills
- Provision of statutory benefits and concessions

The Field Workers need to be adequately trained for imparting such training to the individuals. Many a times, it is essential to avail services of experts, particularly in case of counselling and communication skills and to involve family members at all stages of such training.

The Field Workers should be provided age-specific training in orientation & mobility as per details given in Chapters IV and V on O&M and Daily Living Skills. They also assist the beneficiaries to avail various support services and concessions etc.

10.1 Nature of Services

The project envisages assisting the visually impaired persons to obtain various travel concessions, monetary benefits and other facilities from the local administration, development agencies, and State as well as Central Governments. Enable a disabled person to avail concession on travel in the local buses to enhance his mobility and social esteem. Extension of such benefits also enhances acceptance of the project among the disabled individuals, their family members and the community.

10.2 Extent of Coverage

The Field Worker should provide information about various concessions, explain the procedure and help the individuals in completion of formalities. He may also need to involve the appropriate authorities and seek their cooperation in this respect.

10.3 Type of Support Services

For enhancing social integration, reducing the cost incurred on account of disability, ensuring equality of opportunities, and promoting economic rehabilitation of the disabled, the Central Government, State Governments, local authorities and other instrumentalities of the Government have evolved a variety of schemes of extending concessions, benefits and support services to persons with disabilities. The Field Workers must enable the visually impaired persons to avail the same. There may also be a few schemes which have been promoted by a particular State Government for a particular period. The Project Implementing Agency must keep a track and keep the field staff apprised of the same.

11. Integrated Education

On completion of social integration in terms of training in orientation and mobility, daily living skills and counselling, the incurable persons are divided into school-age and higher age groups. At this stage, the children are referred to agencies implementing integrated or semi-integrated education. Whereas other cases are taken up for further rehabilitation.

Integrated Education Process

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              ┌─────────────────────────────────────────┐
              │ Identification of Visually Impaired Children │
              └─────────────────────────────────────────┘
              ┌─────────────────────────────────────────┐
              │      Check up by Ophthalmic Surgeon      │
              └─────────────────────────────────────────┘
Social
Integration
              ┌─────────────────────────────────────────┐    Field Workers
              │   Certification: Incurable Visually Impaired │
              └─────────────────────────────────────────┘
              ┌─────────────────────────────────────────┐
              │             Social Integration           │
              │ O&M │ ADL │ Parent │ Counselling         │
              └─────────────────────────────────────────┘
              ┌─────────────────────────────────────────┐
              │             School Admission             │
              └─────────────────────────────────────────┘
              ┌─────────────────────────────────────────┐
              │           Pre-Braille Activities         │
              │ Concept of │ shapes and │ Tactual         │
              │   Touch    │   sizes    │ Discrimination  │
              └─────────────────────────────────────────┘
Integrated                                              Itinerant
Education                                                Teacher
              ┌─────────────────────────────────────────┐
              │                 Braille                  │
              │ Alphabets │ Numbers │ Read & Write       │
              └─────────────────────────────────────────┘
              ┌─────────────────────────────────────────┐
              │         Use of Auditory Senses           │
              │            & Other Means                 │
              └─────────────────────────────────────────┘
              ┌─────────────────────────────────────────┐
              │         Use of Braille Equipment         │
              │ Braille │ Arithmetic │ Brailler │ Geometry│
              │ Frame   │  Frame     │          │ Equipment│
              └─────────────────────────────────────────┘
              ┌─────────────────────────────────────────┐
              │             Back-up Services             │
              └─────────────────────────────────────────┘
Class Teacher        Family Members        Fellow Students
              ┌─────────────────────────────────────────┐
              │             Support System               │
              └─────────────────────────────────────────┘
                    Implementing Agency
                    (Project Supervisor)
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Role of Field Staff: As integrated education needs specific inputs, the Field Workers should limit their role to:

- Identification of visually impaired children
- Their referral to the eye hospital
- Promoting their social rehabilitation, and
- Parent counselling.

With the admission of the child into the village school, the role of the Itinerant Teacher begins. (Refer to Chapter VIII on Integrated Education for details)

12. Economic Rehabilitation

12.1 Explanation of the Term

The term economic rehabilitation does not mean a formal, secured or regular employment only. It also means:

- any trade, economic activity or profession,
- in the organized as well as unorganized sector,
- any trade that would provide with some monetary remuneration.

The term employment used by rehabilitation planners generally ignores a vital aspect that the community itself offers a wide spectrum of opportunities where visually impaired persons may be absorbed in gainful occupations. Rehabilitating a 50 year old lady in a remote village in India, for example, means making her a fully functional person in her own house and helping her to take care of her household activities as she used to perform prior to her visual impairment. Majority of women in rural areas are expected to perform the following activities:

- Cook meals for the family
- Perform household activities
- Take care of children and the elderly
- Fetch water and firewood
- Undertake rural occupations or the family trade.

If a visually impaired woman performs the above activities, she is directly helping in the running of the household and she enables the other family members to undertake income generating activities and in the process she contributes indirectly towards family earning.

If a visually impaired person is given the confidence and the training to undertake production activities which are essentially rural, where the raw material is available locally and a ready market is also available, he is directly contributing to the family income. This is what is meant by gainful occupation and thus economic rehabilitation.

12.2 Ultimate Goal

The economic rehabilitation should be the ultimate goal of a CBR programme. Every person who is otherwise eligible and capable should be provided such services to enable him to undertake an occupation and to contribute, in whatsoever way, to the family income. The main categories of vocational rehabilitation include:

- Traditional rural crafts and activities
- Small businesses and petty shops
- Small co-operatives
- Agriculture and horticulture
- Technical and professional activities
- Dairy and animal husbandry

12.3 Useof Community Resources

While imparting vocational training, every effort must be made to utilize the existing community services. It is recognized that the community resources will most likely have the ability to effectively assist the visually impaired persons. The Field Workers should play a crucial role in guiding and supervising community services to offer appropriate training to the individuals.

12.3.1 Examples of local resources are:

- Agriculture extension services
- Local craftsmen such as weavers, basket makers, potters
- Existing co-operatives of craftsmen
- Co-operatives banks and rural development banks
- Nationalized banks and other loan giving agencies
- National Handicapped Finance & Development Corporation
- Technical & craft training institutes
- Labour and employment agencies
- Community development, health and agriculture workers
- Various rural and community development and subsidy schemes

12.3.2 Illustration: Examples of various traditional rural crafts or activities currently being pursued by visually impaired persons around the country are:

- carpentry
- poultry keeping
- farming
- bread making
- forestry
- pottery / selling pots
- bone setting
- rope making
- preaching
- bicycle repair
- duck keeping
- foot-wear making
- sericulture
- rice husking
- rice processing
- water hut
- Hide processing
- coir products
- vegetable selling
- candle making
- broom and basket making
- food processing
- knitting / sewing
- dairy farming
- brick making
- leaf plate making
- weaving
- goat / sheep keeping
- pump repairing
- fishnet making
- petty shop-keeping, etc.
- inland fishing
- rice puffing
- bee keeping
- *papad* rolling
- Wick making
- skinning dead animals
- fence fabrication
- incense stick making
- mat weaving

12.4 Role of the Field Worker

The Field Worker is expected to perform the following functions for expediting economic rehabilitation:

12.4.1 Selection of Activity: Most visually impaired persons would find the above mentioned activities appropriate. It is essential that the Field Worker makes a thorough assessment of the potentials, interest and capacity of the individual before deciding the suitability of the trade or the activity. It is also essential to consider the family background of the individual as many rural crafts are caste-oriented.

12.4.2 Training of Individuals: The Field Worker should organize training of the individual in the selected activity. The family should also be actively involved in such training. Also, the market must be researched to ensure that the activity is viable and income generating.

12.4.3 Organizing Inputs: The Field Worker should also assist the individual in availing:

- Bank loan
- Subsidy, and
- Other financial inputs for the activity.

It is essential that the Field Worker must not create any dependence upon himself/herself or undertake the responsibility for purchase of raw materials and sale of finished products. The trade must however be selected by the visually impaired person himself. These areas should be assigned to the individual or the family members.

The Field Worker may, however, assist:

- in compilation of relevant market information,
- in availing launching grants, monetary incentives, and
- in compiling market information.

12.5 Non-income Generative Activities

It is not always possible to find suitable formal or paid employment in the rural areas. The visually impaired should be taught the income generating tasks or gainful occupations undertaken by the household and save hiring a daily wager. The opportunity income should thus be considered a step towards economic rehabilitation.

In many instances, ability of a visually impaired women to manage and maintain the household is equally important to the survival of the family as is paid employment. Therefore, the Field Workers should make all efforts to encourage informal, unpaid and gainful employment of the individuals.

12.6 Facilities for Economic Rehabilitation

After the person is successfully trained in a particular trade, the objective should be to make him self-reliant by enabling him to get finance and other inputs. Some Government schemes for training, credit and employment are listed below:

a. *Bank loan*: All nationalized banks are required to give loans to visually impaired persons at a differential interest rate of 4.5 percent upto Rs. 7,500.

b. *Loan from NHFDC*: The Ministry of Social Justice & Empowerment has constituted the National Handicapped Finance & Development Corporation for providing soft loan to persons with disabilities at minimal rate of interest. The NHFDC has appointed state level agencies for processing the loan applications and for the disbursement and recovery of loan etc.

c. *Subsidy*: The IRDP (Integrated Rural Development Programme) has provision to give a subsidy upto 67 percent on loans given by nationalized banks and Government institutions to visually impaired persons. It has now become mandatory to ensure that at least 3 percent of the beneficiaries under IRDP are persons with disabilities.

Lakhrabhai Sieving Earth

Agriculture

d. *Training*: There are schemes like TRYSEM (Training of Rural Youth in Self Employment) which provides training in rural trades and handicrafts and helps in supply of tool kits to rural artisans. The visually impaired youth can be registered/ involved in such schemes.

e. *Credit*: The DWACRA (Development of Women and Children in Rural Areas) scheme helps in development of horticulture, pisciculture, sericulture and similar activities through support of formation of groups of 10 to 15 women, and supply of credit to undertake economic activities.

f. *Employment promotion*: The JRY (Jawahar Rojgar Yojna), an employment promotion scheme to generate additional gainful employment for unemployed and under-employed women and men in areas of watershed development, social forestry, construction of rural link roads and rural housing.

g. *Most State Social Welfare Departments* have loan schemes for the visually impaired. There are also schemes for the scheduled castes, schedule tribes and other backward classes. If the visually impaired person falls under these castes, loans can be availed under these schemes also.

h. *Development agencies* like the National Association for the Blind, foreign funding agencies like the DANIDA, OXFAM and Sight Savers International can be approached for obtaining assistance.

i. *Local agencies* like District *Panchayat* and *Taluka* Development Agencies, also have funds for disseminating the same to the visually impaired.

j. *Service Clubs* like the Lions, Lioness, Leo, Rotary, Rotaract, Inner Wheel, Round Table, Y's Men and Jaycees have sizable funds for promoting social work. These service clubs should be approached for obtaining financial assistance for the economic rehabilitation of the visually impaired.

k. *Other sources*: Donations can be raised from philanthropists, service-minded persons, and other agencies having funds for promoting economic rehabilitation.

13. Social Rehabilitation

As per the existing demographic pattern of the visually impaired, in 69 percent of cases, on-set of visual impairment is after the age of 60 years. Thus a large number of persons identified in the project area would be in the age groups 60 years and above. Generally for a person in this age group, it may not be possible to plan for any meaningful economic rehabilitation. In most of such cases, the only viable alternative may be to provide services of social rehabilitation.

As mentioned earlier, all the services of door-to-door survey, eye screening, ophthalmic inputs, initial assessment, training in orientation & mobility, counselling and activities of daily living, provision of travel concessions, pension etc. should be provided to the persons falling in the higher age group as well.

The persons in the higher group should also be provided the following additional services:

- Individual counselling
- Family counselling
- State disability or aged pension
- Other monitory assistance
- Health care

13.1 Individual Counselling

The persons in the higher age group need to be counselled in respect of accepting their visual impairment, supporting the family in the day to day activities, looking after their personal needs, managing their mobility and activities of daily living to the extent possible.

13.2 Orientation & Mobility

(Refer to Chapter IV on O&M for specific O&M needs of this group).

13.3 Aged Pension

Most State Governments in India provide pension to the visually impaired in the range of Rs. 60 to Rs. 200 per month. The criteria, age, amount and procedure for availing such pension varies from State to State. Application has to be made in a prescribed form to the respective Social Welfare Department through the revenue authorities.

13.3.1 Role of the FieldWorker:

- Apprise the individual and family members about the scheme
- Compile required information from the family or village records
- Collect documents to be enclosed with the application
- Arrange photograph of the applicant, if required.
- Complete the application form and submit to the concerned authorities
- Follow-up with the concerned authorities regularly
- Keep the family informed about the progress in this regard.

13.3.2 Role of Project Supervisor

- Compile the latest information about the pension scheme
- Collect the application forms
- Share information and distribute forms among the Field Workers
- Follow up the completion of application forms
- Approach the revenue authorities for follow up
- Verify the mode of release of pension regularly.

13.3.3 Role of Project Director

- Motivateofficials to cover more people and increase pension amount
- Make efforts for simplification of the procedure
- Ensure release of pension regularly
- Verify detailsof sanction, release and pending cases of pension
- Seek cooperation of revenue officials in processing applications
- Create public awareness about the scheme through mass media

13.4 Other Monitory Assistance

In some States, a part from the aged persons, other individuals are provided other assistance in cash or kind. For example, during drought in Gujarat, people were provided cash dole and grains etc.; in Haryana, every aged person irrespective of income is provided cash assistance; certain welfare agencies provide grains to helpless people, blankets and clothes to the needy during winter, milk powder to weak persons and other cash assistance to the needy and deserving persons. The Project Supervisor should compile such information and share the same with the Field Workers.

All efforts should be made to extend all these benefits to the aged persons. The similar procedure as in case of pension or the procedure as prescribed by the concerned agency should be followed.

13.5 Health Care

Most aged persons would require health check-up, diagnostic services, medical treatment or surgical intervention. The set objectives of the project do not encompass extension of general health care to the beneficiaries. The Project Implementing Agency may, however, tie up health care with other rural development or public health agencies. The Implementing Agency may not extend the health care on its own. It may, however, encourage referral of the individual to appropriate agencies.

The provision or referral for health care would establish credibility and enhance acceptance of the Project Implementing Agency in the area. It would be easier to seek cooperation of the community workers, opinion leaders or family members in the service delivery and the project implementation. The general health care would also achieve the objective of enhancing mobility and self care of the individual.

14. Case Completion

Due to financial constraints, large and scattered target group and other such factors, it is never going to be possible to provide intensive services to the same individual over many years. The envisaged CBR approach advocates category specific, need based and relevant services for each visually impaired person in the project area. After an individual has been provided need based services as explained earlier, he/she should be dropped as a completed case. The further services should, however, be provided by the family members and the community.

14.1 Check List

The Field Worker should use the following check-list for verifying whether the required services have been provided or not. The check-list should be completed in context of above noted age-specific individual need based services.

Table: Check list - Rehabilitation Services

Services/ Age Gropu	Medical Check-up	O&M	ADL	Parent counselling	Bus pass	Pension	Scholar-ships	Eye restoration	Intergrated education	Vocational training	Bank loans/ subsidy	Financial assitance
1	2	3	4	5	6	7	8	9	10	11	12	13
0-5 yrs	Yes	Training to parents	Yes	Yes	-	-	-	Yes	-	-	-	-
6-15 yrs	Yes	Yes	Yes	-	Yes	-	-	Yes	-	-	-	-
16-50 yrs	Yes	Yes	Yes	-	Yes	for those above 45 years	-	Yes	-	Yes	Yes	Yes
50 and abouve	Yes	Yes	Yes	-	Yes	Yes	-	Yes	-	-	If person is Physi-cally fit	-

14.2 Procedure for Dropping Completed Cases

At a time, the Field Workers should cover at least five individuals for providing individual need based intensive services. The number of persons to be taken up simultaneously would, however, depend upon the following factors:

- Geographical terrain
- Prevalence of visual impairment
- Demographic pattern of visual impairment
- Nature and extent ofmetal roads
- Availability of public transport
- Distance from the residence of the Field Worker
- Distance from the block headquarters
- Extent of involvement of family and community
- Mode of transport used by the Field Worker
- Experience of the field staff etc.

As explained earlier, the Project Supervisor should assist the Field Workers in deciding such cases to be taken up simultaneously. Using the above mentioned check list, the field staff should establish whether a particular beneficiary has been provided all the required services. Whenever any person has been provided these services, the same should be considered a completed case. And the next case from the same village or the adjoining village should be taken up.

Thus any particular Field Worker should cover a required number of cases (generally five) for providing intensive services. One must not wait for all the cases to be completed and dropped for covering the next batch of cases. Thus dropping of completed cases and taking up of new cases should be a continuous process.

14.3 Case Completion Report

Whenever any person has been dropped as a completed case, the proforma on *"Case Completion Report"* should be completed. The Field Workers should record nature of services, provided

date of completion and such other relevant information. Details about the following services should be recorded in the proforma.

a. Door-to-door survey
b. Ophthalmic check-up
c. Certificate of blindness
d. Counselling: family, individual
e. Nature of training: O & M, ADL, home economics
f. Economic rehabilitation
g. Type of support services
h. School admission, scholarship etc.
i. Any other assistance or services

This proforma should be completed by the Field Worker, checked by the Supervisor and verified by the Project Director. The proforma should be filed in the individual case file of each individual.

14.4 Follow-up

As mentioned earlier, on provision of individual need based services, the individual is considered a completed case under the programme. Thus the programme encourages only individual specific intervention and provision of services. It is expected that the further services would be provided by the community and the family.

It is, however, desirable that periodic follow-up should be done by the Field Worker to ensure continuity of services and acceptance of the individual in the fold of the family. It is recommended that, in the beginning, the Field Worker should follow-up each case at least once a month. The frequency of follow up visit which depends upon the following factors may be reduced subsequently:

- Nature of rehabilitation
- Age of the individual
- Specific requirement of individual

- Cooperation and support of the family
- Interest of the individual
- Frequency of visit to the same village for providing services
- Location of the village

If the village is located on the route of the Field Worker, possibility of follow-up would be higher. Generally more frequent visits would be required in case of vocational rehabilitation as compared to the individuals who has been provided services of social rehabilitation only.

The family members and community should participate actively while planning individual services, imparting training, extending support services and evaluating the performance. The principle objective should be that community should accept the individual in its fold and continue extending further services and co-operation.

15. Monitoring of the Project

While block level administration of the project should be done by the Project Implementing Agencies, an effective system of project monitoring and control at the field level must be evolved.

15.1 Weekly Review Meetings

It is necessary to convene weekly review meetings of the field staff at the headquarters of the Project Implementing Agency. Performance of field staff with respect to rehabilitation, education and participation achieved during the preceding week should be discussed. Similarly, work allocation for the following week for each Field Worker should also be done. The problem faced by the field staff and their distinctive achievements should also be discussed in the meeting.

It is also advisable to involve the specialists who are providing support services for the programme. The Field Worker may

discuss relevant problems and seek their advice. The Project Supervisor should be encouraged to maintain Minutes of the proceedings of each such meeting.

15.1.1 Persons who should attend the meetings
- Field Workers
- Project Supervisors
- Project Coordinator
- Project Director
- Representative of the Central Coordinating Office
- Concerned officials of the local administration

15.1.2 Agenda for Weekly Review Meeting
- Review of previous week's performance and action taken
- Items discussed
- Decisions taken
- Plan for the next week
- Conclusion

15.2 Attendance Card

An attendance sheet will be kept at the home of visually impaired person. The Field Worker should complete the following information in the proforma and hand over the same to the visually impaired person or the family members:
- Name of the beneficiary
- Serial number of the attendance sheet
- Name of the village
- Name of the cluster
- Name of the project
- Date of keeping the sheet at the home of the beneficiary.

Whenever Field Worker, Supervisor, Project Director or other officials of the Project Implementing Agency visit the beneficiary,

they should ask for the attendance sheet and sign the same after putting their name and the date of visit. Such visitors may also put any remark, if desired so, in the sheet.

The Project Supervisor should verify the date and time of visit of the Field Worker from the sheet. This sheet should be used as a document for the monitoring movement of the field staff.

15.3 Monthly Reports

The Project Implementing Agency should prepare a monthly report of physical as well as financial performance in the enclosed proforma. For evaluating physical performance of the project, all aspects of rehabilitation of each individual should be considered.

15.3.1 Physical Performance Report: The Project Implementing Agency is required to submit the physical performance report every month to the Central Coordinating Office or to the Funding Agencies as per the memorandum of understanding. The report should provide the following information:

15.3.1.1 Rehabilitation component: The proforma XV should be used for preparing the monthly performance report in respect of rehabilitation component. This proforma should be completed based on the information provided in the physical performance register. The monthly report should provide following information:

- General information about the project
- Details of review meetings held during the month
- The extent of awareness created during the month
- Baseline data about curable and incurable visual impairment

Details of service delivery in terms of:
- Certificate of visually impaired
- Orientation and mobility
- Daily living skills

- Bus pass
- Economic rehabilitation
- Pension
- Loan/subsidy
- School admission
- Any other.

15.3.1.2 Integrated education: As integrated education requires intensive and systematic inputs, the monthly performance report in this respect should be more elaborate. A detailed report with the following parameters should be submitted for each visually impaired child:

a. General information of the project
b. Child-wise report
   - Number of home and school visits
   - Individual training in O&M, ADL, braille
   - Supply of instruction material, braille books, large print, tactile material, recorded cassettes
   - Participation in co-curricular activities, holiday camp etc.
   - Other relevant information

c. General report
   - Difficulties mentioned by teacher, parents, students
   - Details of visitors to the programme
   - Liaison with Government officials
   - Meetings with school staff, parents, fellow students

d. Any efforts on public awareness

This information should be checked and authenticated by the Project Director. It should be submitted every month to the CCO or the Funding Agency etc.

15.3.2 Financial Report: The Project Implementing Agency is also required to submit the financial performance report every month in the prescribed proforma to the CCO or to the Funding Agencies as per the Memorandum of Understanding or the sanction letter. This report should provide the following information:

- Opening balance
- Receipt during the month
- Recurring & non-recurring expenditure during the month
- Closing balance

The Project Implementing Agency should submit separate financial reports regarding the rehabilitation as well as integrated education components. The monthly financial report of the CBR project and that of integrated education component should be submitted to the CCO.

As the Central Coordinating Office follows the system of reimbursement of expenditure every month based on actual or admissible expenditure, it is essential to submit the monthly financial reports before the 5th of next month.

15.4 Reporting Formats

A variety of project monitoring and reporting formats have been developed for compiling information, analyzing the performance, maintaining records of progress of the project and for the purpose of submitting regular reports on physical and financial performance of the project.

15.4.1 Uniform Reporting Formats: From the experience of implementing CBR projects for the visually impaired across the country, it has been learnt that it is feasible and desirable to develop uniform reporting formats for the country as whole. Through the use of uniform formats, it would be possible to analyze these formats with the use of computer and it would be easy to compare inter project performance.

15.4.2 Easy Formats: It is, however, desirable that such formats must not be very cumbersome and time consuming. It should be possible for the Project Supervisor to complete all the formats within a few hours. In fact, wherever such formats are very cumbersome and time consuming, the biggest problem has been their timely completion. Many a times, this aspect becomes the biggest obstacle in the project administration.

15.4.3 Language: All the formats have already been evolved in English. All the formats as per paragraph 15.4.6.1 which are required to be used in the field by the Field Worker must be translated into the local language. The formats which are to be maintained at the headquarters of the Project Implementing Agency may be kept in English or the regional language depending upon the convenience of the Agency.

The formats which are to be completed and submitted every month to the Central Coordinating Office or the Funding Agency must be maintained in English only. As the CCO or Funding Agency has to receive and analyze these formats from across the country, it is essential that these reports are provided in English only.

15.4.4 Printed Formats: It is advisable to get the formats printed and distributed among the Project Implementing Agencies. It would ensure uniformity in completion of the formats. It is generally easier to record and analyze pre-planned and printed formats. The agencies should be encouraged to complete the formats in every respect.

15.4.5 Flexibility in Reporting: It is generally never possible to evolve a programme which may be accepted in totality all over the country. There would definitely be regional modifications in the approach and nature of services. Hence there is adequate scope and flexibility for accommodating such modifications in the reporting formats also.

15.4.6 Recommended Formats: For effective monitoring of the programme, the following formats are essential. There are three categories of reporting formats. The first categories of formats would be used by the field staff for recording progress and performance of the project. The second category of formats would be used for maintaining records of the Project Implementing Agency. Whereas the third category of formats would be submitted to the Central Coordinating Office or to the Funding Agencies.

15.4.6.1 Field Level Formats

    a.   Door-to-door survey
    b.   Vision screening by ophthalmic personnel
    c.   Individual case file
    d.   Initial assessment form
    e.   Diary of Field Worker
    f.   Performance sheet for each client
    g.   Attendance sheet: kept at the home of the beneficiary

15.4.6.2 Implementing Agency level Formats

    a.   Summary of vision screening
    b.   Baseline data - curable cases
    c.   Baseline data -incurable visually impaired persons
    d.   Summary of baseline data
    e.   Weekly visit proforma
    f.   Weekly review meetings
    g.   Physical performance register
    h.   Case completion report

15.4.6.3 Reports to be submitted to the CCO or Funding Agencies

    a.   Monthly physical performance report: CBR
    b.   Monthly financial performance report: CBR
    c.   Monthly performance report for each child: IE
    d.   Monthly financial performance report: IE
    e.   Project completion report: CBR & IE

Wherever it is possible to use the formats in English, the same formats may be used. It is desirable that such reporting formats must consider regional modifications in the approach and programme implementation plan.

For details of these proforma, kindly refer to;

Punani; Bhushan; and Rawal; Nandini (1990) *Mannual : Community Based Rehabilitation (Visually Impaired)*, Mumbai : National Association for the Blind, Rural Activities Committee, P. 247-264

15.5 Case Studies

It has been established that the reporting formats may enable the Central Co-ordinating Agency to generate quantitative data and statistical reports only. The report may be used effectively for the monitoring and evaluation of the performance of the programme. It is, however, not possible to generate qualitative reports from these formats.

As mentioned earlier, one of the principal objectives of the programme is to create public awareness. Thus the Project Implementing Agencies should prepare and submit human interest stories on the successful cases of complete rehabilitation. Such stories are generally more effective in projecting progress and achievement of the programme than just producing reports on quantitative and statistical analyses of the performance of the programme.

15.6 Individual Rehabilitation Plan (IRP)

For effective implementation of CBR, concept of individual planning, i.e. considering every individual a separate entity and planning comprehensive rehabilitation according to individual felt needs should be adopted. Our approach should be client centered and in consonance with socio-economic conditions of the area.

The service should not be delivered on the basis of pre-conceived

notions and experience elsewhere. It is essential that the services should be area specific and as per felt needs of the individual. Thus the type of crafts, trades and remunerative occupations would depend upon the area and specific requirements and potential of the individual.

For this purpose, an individual case file for every individual with detailed information should be maintained. All the services as and when provided to the individuals should be recorded in the case file. The case file should contain the following information for each individual:

a. General information of the individual

b. It should have the following enclosures:
   ● Assessment form
   ● Certificate of blindness
   ● Individual rehabilitation plan
   ● Bus pass or travel concession
   ● Pension form
   ● Details of bank loan, launching grant, subsidy etc.

c. Individual Rehabilitation Plan should cover the following aspects:
   ● Ophthalmic inputs
   ● Nature of counselling
   ● Individual training in O&M, ADL, Braille etc.
   ● Nature of economic rehabilitation
   ● Other services
   ● Status at case closure

A separate case file should be maintained for each incurable visually impaired individual. It should be updated regularly enlisting all the services rendered and results achieved. The information in each case file must be verified by the Project Supervisor and the Project Director regularly.

16. Evaluation of CBR Projects

16.1 Conventional Approach

Most rehabilitation projects at present are evaluated on the basis of the following parameters:

a. Subjective descriptions of the project
b. Expenditure pattern
c. Systems of release of funds
d. Objective evaluation
   ● Extent of training of personnel
   ● Coverage of disabled
e. Financial allocations
f. Adherence to time table
g. Mass media coverage, etc.

16.2 Limitation of Conventional Approach

The evaluation of the project on the basis of these indicators ignores the following vital indicators:

● Direct benefits to the disabled
● Impact on environment, physical and financial
● Sustainability of programmes
● Extent of replicability of the project
● Extent of community involvement

16.3 Guidelines for Evaluation

The following guidelines for evaluation of CBR projects are based on E. Helander's publication *"Dignity and Prejudices"*

Table: Guidelines for evaluation of CBR projects

Factor	What to look for	Comment
Relevance	Meeting needs of the disabled, family and community	Rehabilitation is a on-going process
Effectiveness	Benefits for the disabled and population coverage	Coverage should be target oriented
Efficiency	Use of resources in most efficient way	Management of personnel, training, budget, provisions
Sustainability	Continuity of programme on withdrawal of assistance	• Community own programme and feels responsible. • Components which cannot be maintained should not be introduced.
Impact	Institutional, technical, economical & social settings	• Social acceptance • Equal participation • Removal of physical barriers • Attitudinal changes
Shift	• Charity to opportunity • Institutions to community • Segregation to integration • Dependence to contribution • Diffidence to self confidence	Intangible and tangible gains to the disabled and community
Replicability	Different geographical locations, different age groups	Mechanism and regional modifications
Comprehensive	Medical, social, economic, educational & support services	Coordinated approach Simultaneous Coverage
Political Will	• Change in State policy • Nature of schemes	Level of acceptance and support

16.4 Important Aspects of Evaluation

The project should be evaluated on the basis various aspects as listed.

Table: Important aspects of evaluation

Aspect	Alternatives
WHOM	Community Government Donor Agency Coordinating Agency Academic & Research Purpose
WHO	Internal External Evaluators - (Preference)
WHEN	Quarterly Annual At the end of project period Periodical Continuing
WHERE	In the field Through records Collecting disabled people Community
WHY	Continuity Modification Contractual obligation In-built system
KIND	• Technology *(Progress of individual services)* • Delivery *(Programme effectiveness)* • Management system *(Resource utilization)* • Empowerment to community

Remember: Evaluation is a Means - not the End.

16.5 Frequency of Evaluation

The periodic and on-going evaluation should be done by the Project Implementing Agency. The Project Director may consistently monitor the progress of the project. He may evaluate the performance in context of above mentioned parameters. The CCO may plan an periodic systematic evaluation of the project in context of these indicators. The CCO may organize evaluation of the project before its completion.

REFERENCES:

Murthy, S.P.; and Gopalan, Lyn (1992): *Work Book on Community Based Rehabilitation Services, Bangalore*: Karnataka Welfare Association for the Blind, P.135

Mani, M.N.G. (1991): *Ingredients of IED*, Yedakad: *ovis Publishers*,P.79

Wadhwa (Dr.), Sanjay; and Athani (Dr.), B. D. (1989): *Draft Action Programme for Inclusion of CBR in Health Care Delivery System for States in India*, Delhi, (assistance of) World Health Organization, P. 104

The Persons with Disabilities Act, 1995 recognises "rehabilitation including community based rehabilitation" under Section 48 and desires the appropriate Government and local authorities to promote and sponsor research in this area as well. Due to this mention of the CBR in the Act, the Ministry of Social Justice and Empowerment has already evolved a national scheme on promotion of CBR.

CHAPTER XI

Special Need Visually Impaired Persons

Over the years, number of visually impaired children with other disabilities has been steadily increasing. This probably is happening due to declining child mortality, better health care services and better pre as well as postnatal care, all these factors result into higher chances of survival of such children. Huebner (1995) also confirms that advances in medical technology have significantly improved the logevity of children who experience them, so that a greater number of premature infants and young children are surviving with multiple congenital anomalies. With expansion of early identification and rehabilitation services to the rural areas and urban slums, such children are now being identified and, of course, need appropriate assessment, early intervention, education and rehabilitative services.

As the Helen Keller Institute for the Deaf and the Deafblind, Mumbai wanted to start a Teacher Training Course for the Deafblind, it approached the Rehabilitation Council of India for the recognition of the course during 1990. The Members of the Sub-Committee of the RCI on Visually Impaired were not sure about the demand for such a course as it was thoughts there were not many children who are deafblind. The members requested the RCI to compile information regarding the number of children who are deafblind. In response to a circular which was sent to most schools for the visually impaired in the country, a list of less than 100 such children could be compiled. Hence the idea of recognizing a Teacher Training course was dropped.

During 1998, the Blind People's Association started a comprehensive project with the support of Sense International India for the promotion of services for children who are deafblind. During first year itself, it identified 35 such children in Ahmedabad and surrounding areas. The organizations is already planning to establish 5 satellite centres at different locations in Gujarat for the promotion of comprehensive services for such children.

A similar trend has been observed in case of visually impaired children with additional disabilities. The Blind People's Association has already established 5 satellite centres at different location in Gujarat with the support of Hilton Perkins International. It has been conducting a refresher course with the support of the National Institute for the Visually Handicapped for the special teachers for the promotion of services for such children.

The Persons with Disabilities Act also recognizes "low vision" as a separate category of disability. The Section 2(u) provides a definition of "person with low vision"; Section 31 refers to low vision in context of provision of services of amanuensis; and Section 33 (i) refers to low vision in context of job reservation. In other words, the Act clearly recognizes low vision as a category of disability. Over the years, the schools for the blind and community based rehabilitation programmes have identified and enrolled a large number of low vision children. According to certain estimates, the number of low vision children is four times the number of totally blind children.

It is essential for the teachers/workers of the visually impaired to understand demographic pattern, specific needs and rehabilitation aspects of special need visually impaired children including those with low vision, deafblindness and multiple-disabilities.

I. Persons with Low Vision
(By : Ms. Karin van Dijk)

1. Introduction

Many people, who have been regarded and labelled as blind, have some useful vision. It is estimated that four times as many people have low vision as compared to the numbers of blind. Many need surgery or refractive services to improve their vision, others need low vision care.

There is a great need to develop appropriate services for people with low vision, especially children, as it is important to encourage them to use the vision they have, in addition they need to be taught how to interpret the little and sometimes incomplete visual information they get, next to the information received through the other senses.

In India, as in many other developing countries, education has been geared towards blind children and rehabilitation towards blind adults. Anyone with reduced vision and no vision at all was labelled blind, both by the eye care and the educational profession. As a consequence, low vision children with a potential to use vision for activities such as reading print have been taught as if they are blind.

In some cases, they have been regarded as backward or mentally handicapped, as they could, for example, only read slowly and not copy from the blackboard, due to their limited vision.

Adults, sometimes, have not performed certain activities that required vision, as they and their environment regarded them as blind. Others have been branded as cheats as they could, for example, read print, a 'sighted' method, but not walk around safely without using a cane, a 'blind' method.

The elderly population is growing and with it the number of people needing low vision care. This important group of people

is often forgotten in services for people with visual impairment, but needs to be included in the future. Often this group has poor access and little knowledge about possibilities to improve vision and/or its use.

The people with low vision of all ages have different visual abilities. Those with the same eye condition and visual acuity neither necessarily make the same use of their vision nor do they manage in the same way.

2. Definitions

(Kindly refer to Chapter 1 for definition of low vision)

As per WHO Working Definition of Low Vision (WHO, 1992), a person with low vision is one who has impairment of visual functioning even after treatment, and/or standard refractive correction, and has a visual acuity of less than 6/18 to light perception, or a visual field of less than 10 degrees from the point of fixation, but who uses, or is potentially able to use, vision for the planning and/or execution of a task.

When comparing this 1992 definition with the standard WHO definition, it is clear that there is an emphasis on what a person can still do with their vision in the working definition. This is useful in order to avoid labelling people blind unnecessarily. The standard definition is used in medical report and publications and is solely based on visual acuity and does not take into account functional vision.

It is important to make sure that everyone involved is educated about the facts, else, for example, a parent might think a low vision child should not use the eyes to read. Another example of wrong behaviour is that a husband discouraging his wife from wearing glasses.

3. Components of a Low Vision Programme

A teacher cannot work adequately with children who have not been clinically assessed and refracted. It is important to try to improve vision first through treatment and/or glasses. A number of children will then have normal vision and can leave the programme. Others will still be low vision, but with better visual acuity.

However, once a child has been identified as low vision. Information from a functional assessment can be very helpful to ophthalmic staff while prescribing the type of magnifying device. Therefore, functional assessment can come before a thorough clinical assessment, if a person has been identified as irrevocably low vision.

The following sequence may be followed while implementing a low vision programmes:

3.1 Identification and Referral

Methods	Staff that can be trained/involved	Resources needed
Through screening children in existing 'blind' programmes	Specialist teacher Rehabilitation workers	E-chart (+pinhole) Screening forms Referral forms
Through community vision screening programmes	Health workers Community workers Primary school teachers	same as above
Through eye care programmes	Ophthalmic personnel	

Points to remember:

a. Particular attention needs to be paid to identification of impaired vision and visual problems in children from 0 to school-age.

b. Early detection can prevent or make less severe a lot of visual impairment and/or assist children in maximizing the use of their remaining vision.

c. Close cooperation with prevention of blindness or eye-care programmes is essential.

3.2 Clinical Assessment and Treatment of Eye Problems

The following activities should be performed for promoting clinical assessment and eye treatment:

a. Clinical assessment, treatment/operations and refraction

b. Assessment for and prescription magnifying devices needs to be part of the work of ophthalmic staff. In large cities a low vision specialist might have been trained to do the work.

3.3 Sharing Information

It is very important to make the individual, her family and all professionals concerned with low vision understand that even little vision can be useful and should be used, so people are not treated unnecessarily as if they could see nothing and are deprived of using their sight. For example, in India a child with a VA <6/60 is legally blind, but might be able to use print as a reading and/or writing medium. Many children who have corrected visual acuity in the better eye of less than 3/60 have useful residual vision and benefit from low vision services.

3.4 People's Belief about Vision

There are many different beliefs about eyes, using them to see when you do not have good vision, low vision, blindness and their possible causes. Here are some common beliefs or myths, followed by the real facts.

Myths.....	.....Facts
My child's sight will wear out if it is used too much	Eyesight cannot be worn out by use. Your Child can use it as much as he/she likes!
Keeping a book very close when reading will reduce vision in the long term.	Vision will not reduce, although the muscles that move the eyes may tire. If this happens, rest for a few minutes.
If a hospital prescribes glasses this means that your child is losing sight slowly, surely. He/she will go blind in the long run.	No! Glasses improve vision for those who need them.
Reading in a dim light will damage sight.	It is not helpful to read in a dim light, but it cannot harm the eyes.
Electric lighting is bad for the eyes.	Good lighting of any sort is a valuable aid to vision.

Training a key person in the use of a magnifying devise is vital, as the client needs to be trained over a period of time in its use. Teachers, CBR workers with support of family members can implement this training.

Now all patients with treatable and/or preventable low vision should have been helped, and only those with irrevocable low vision should be still in the special education or rehabilitation programme.

3.5 Referral to Programmes

The referral of low vision individuals to preschool, education, vocational training, community based rehabilitation and other special and integrated programmes should be encouraged. The absence of early intervention programmes or preschools in certain areas, or other relevant programmes will limit effective referral. Cooperation with programmes that could include people with low vision in future is a way of expanding referral options.

Training of staff to understand the implications of low vision is again a vital component.

3.6 Functional Assessment

Visual acuity figures do not tell what a person is able to do with his/her vision. It is essential to assess what can be seen and what not, under which circumstances and how vision is used for different tasks.

Involvement of the family members of a low vision person in the functional assessment is vital. They also need to understand what a person can see and what not, where there are possibilities and where there are problems.

Methods	Staff that can be trained/involved	Resources needed
Using low vision kit: 'Assessment of Low Vision in Developing Countries'	Specialist teachers CBR workers Vocational trainers Pre-school staff	Low vision kit Daily use objects Recording forms
Vision checklist for very young children	Pre-school staff CBR workers	Small torch Bright/shiny items. Daily used objects Recording forms

3.7 Training for Effective Use of Vision

Once the effects of low vision and how it is used for each individual person are understood, a training programme for each individual with low vision needs to be developed. It might include activities to encourage the use of vision, and/or to enhance visual efficiency and/or to change the environment. Training in the use of optical and non-optical low vision devices needs to be developed, discussed with the involvement of everyone and implemented.

Methods	Resources needed
Encouraging use of vision	Local, every day materials
Visual skills training	Low vision kit-books
Non-optical devices	Reading stands Black felt pens Reading slit Thick lines with good contrast in exercise books Sun glasses
Low vision (optical) devices	Locally produced magnifiers Magnifying glasses Telescopes
Orientation & mobility training	Using the above resources, while combining the use of vision and other senses
Changing the environment	Using colour, contrast and light to make the physical environment more visible.

4. Important Factors for Low Vision Care

a. *Psycho-social Support*: A person with low vision needs to understand his/her own abilities and communicate these to the environment. Self-esteem needs to be built up as much as possible.

b. *Integration*: Visual training programmes need to be integrated as much as possible in regular activities, at school, at home, at work.

c. *Family Involvement*: Apart from the teachers and CBR workers mentioned before, involvement of family members is vital. They can stimulate a lot of the training needed, if they understand why and how.

d. *Low Vision Devices*: Production, distribution, cost and durability of optical and non-optical low vision devices.

e. *Eye Checkup*: Yearly/regular eye check and follow-ups where needed

f. *Rehabilitation Inputs*: Continued input from education and rehabilitation personnel where needed.

g. *Systematic Assessment*: It is very important to find out what each person with low vision can do with his/her vision, and to teach people how to make the best use of it.

(Book 2 *"Assessment of Low vision in Developing Countries"* gives detailed instructions. It is part of the low vision kit and can be ordered from the WHO).

5. Need for information

(General overview of important areas as given in Keeffe, 1995).

As the effects of low vision are not the same for all people, the following information should be compiled about each person:

a. Extent of vision - near and distance visual acuity
b. Size of the visual field (if relevant)
c. Effects of light and glare
d. Extent of recognition and naming of colours
e. Extent to which contrast affects their activities
f. Extent of use vision for different activities and purposes in the environment
g. Extent to which a person sees and recognizes an object depends, amongst other on:

- familiarity of the object
- light
- size
- distance
- contrast
- colour
- detail or simplicity of the object.

Many of these factors can be used to make thing easier to see. For example, placing agricultural tools in a brighter corner might make it easier to find them visually. Drawing maps using clear black lines on a light background enhances contrast.

6. Assessment of Functional Visual Skills

Assessment of the visual skills re-needed to carry out daily activities, in addition to the information needed on each person outlined above, is important. The following visual skills need to be assessed in order of complexity:

- Awareness and attention to objects
- Tracking
- Scanning
- Discrimination of objects
- Discrimination of details to identify actions and match objects
- Discrimination of details in pictures
- Identification of patterns, numbers and words

Detailed instructions and ideas are given in the *WHO Low Vision Kit*. It can be easily adapted to different age groups and to different purposes.

7. Effective Use of Vision

As outlined earlier, now the child can be trained for the effective use of vision, if needed, based on the findings of the assessment. The three important aspects are:

a.   Encouraging use of vision which is of particular importance to young children.

b.   Improving the method of use for vision, which is visual efficiency.

c.   Changing the environment, for example, by choosing a well-lighted place to work or using low vision devices, if needed.

(Practical activities for training are given in the WHO Low Vision Kit).

8. Low Vision Devices

Many people think that providing low vision care is the same as prescription and training in the use of low vision devices. This is not true. There will be many people with low vision who neither need these devices nor benefit from them. The training to use vision as best as possible might be of much more importance than just learning to use devices.

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These are some of the non-optical devices that might be useful:

- Reading/writing stand
- Black pens, black felt pens
- Exercise books with thicker lines of good contrast, e.g. black
- Reading slit or typoscope
- Use of bright colours where needed
- Use of good contrast
- Adequate lighting or good use of available light
- Sunglasses
- Wearing a cap
- *Large print books*, if available

- Books on cassettes

Of course each person needs to be assessed to determine which device might be useful, if any. The useful optical devices should be locally available, robust and affordable. Again individual assessment of the need and repeated training in their use is vital. A basic service should be able to provide the following for near tasks.

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● *Hand and stand magnifiers* of different strengths

● Magnifying glasses

In addition, services with more resources and training abilities can include:

● *Telescopes* for distance tasks

The optical devices need to be prescribed by a person trained in low vision, either an ophthalmic professional or a low vision specialist.

Training in their use can be done by trained teachers, CBR workers or trained family members.

(Details of how to train can be found in the WHO Low Vision Training Manual).

(For more information on low vision devices, refer to Chapter V)

9. Educational Programmes

If education programmes for visually impaired children are to include the needs of low vision children, the following conditions need to be created (Van Dijk, 1997):

a.   Create awareness about the meaning of low vision, best use of vision and importance of early referral among people with low vision, their families, regular and specialist teachers, eye care staff and the Ministry of Education. The main message needs to be: *"Low vision is not the same as blind"*.

b.   Develop adequate training of the existing special education and eye care staff in low vision.

c.   Ensure that educational placement takes visual abilities into account.

d.   Increase access to clinical assessment, especially in remote areas.

e.   Ensure that children are clinically and functionally assessed before deciding on the educational support needed. Many low vision children might not need a special school, but can be taught in a regular school with some support from a specialist teacher.

f.   Ensure access to affordable glasses to correct refractive errors, in order to improve low vision children's vision as much as possible and to 'weed' out children with normal vision.

g. Place emphasis on near vision assessment, to avoid children being labelled as blind and taught braille unnecessarily.

h. Provide appropriate resources, less educational kits for blind children and more low cost devices such as locally made *reading/writing stands*, writing guides, and magnifying devices are needed.

i. Develop close co-operation between all people involved, like the Ministries of Education, Health Personnel; Non-Governmental Organizations, donor agencies, the education services for the visually impaired and, last but not the least, the visually impaired child and his/her family. This is vital; without it an adequate service cannot be provided.

Through training of existing professionals, parents and the children, the education of low vision children can be improved significantly. The low vision component actually strengthens the cooperation between education and eye care services. The key staff, the specialist teachers and the ophthalmic staff enrich their work through the low vision training.

An educational programme based on actual needs of children and using appropriate resources can be developed this way.

The same applies to rehabilitation services.

10. Information for the Family

Here is a simple example of information that should be given to family and others involved

Hints and tips

*   Low vision children are like anyone else, except they can't see properly. Encourage the child to use sight as much as possible!!
*   Let the child's eyes be examined once a year.
*   If an operation is recommended, make sure that the child goes! It can give him/her some or may be all sight back!!!
*   Ask the specialist teacher to explain the child's eye disease and what he or she can see and cannot see. Also ask the child what he/she can see.
*   Light is very important to see well. Try to make lighting as good as possible.
*   Think about contrast and size. A light plate is easy to find on a dark table. And if an object is bigger, it is of course easier to see, for example a big ball.
*   If possible, provide the child with a black felt pen for writing; it will provide larger and clearer writing than other types of pen.
*   If the child needs to wear glasses, make sure;

    ●   He/she wears them when needed. Some children need to wear them always, others only for reading or only for distance.
    ●   They are cleaned every day with water.
    ●   They do not get scratched. They should be put in a safe place at night, wrapped in soft cloth.

11. Concluding remarks

Low vision is not just another specialism. Low vision services and training need to be part of each eye care, education and rehabilitation programme for the visually impaired. It needs to be integrated in each facet of these programmes.

For example, orientation and mobility training for visually impaired children means that low vision children learn to use vision, if that can be used for mobility, and the other senses where needed. It might mean that they learn to recognize and understand what certain shapes are in reality, how to interpret incomplete visual information and the like, when possible.

The same applies to activities of daily living. An individual with low vision might have to use hearing or touch to know water is boiling, but might use vision to see the difference between peeled and unpeeled potatoes. Where possible and practical, people with low vision should be taught and encouraged to use the sense of vision.

Other important overall issues are:

- Family/community involvement
- Training of all different professionals involved. It is preferred if existing staff is used and their skills enhanced. It is in many cases unrealistic to create a new cadre of low vision therapists.
- Use of existing structures, programmes, resources and staff
- Monitoring and regular evaluation of all aspects
- Coordination of the low vision programme; a national low vision group, comprising of all disciplines, could be established, preferably under a functioning national committee, like a prevention of blindness committee.

This also makes co-operation between the different organizations and programmes involved a regular feature.

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II. Persons who are Deafblind

(By: Akhil S. Paul, Director,
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1. Description of Deafblindness

Deafblindness is a combination of visual and hearing impairments and comes in varying degrees. It may seem that deafblindness refers to a total inability to see or hear. However, in reality:

"Deafblindness is a condition in which there is a combination of visual and hearing impairments that cause such severe communication and other developmental and learning needs that the persons cannot be appropriately educated in special education programs solely for children and youth with hearing impairments, visual impairments or severe disabilities, without supplementary assistance to address their educational needs due to these dual, concurrent disabilities".

Children who are deafblind are educationally isolated because impairments of sight and hearing require thoughtful and unique educational approaches in order to ensure that children with this disability have the opportunity to reach their full potential.

For a young child who is deafblind, the world is initially much narrower. If the child is profoundly deaf and totally blind, his or her experience of the world extends only as far as the fingertips can reach. Such children are effectively alone if no one is touching them. Their concepts of the world depend upon what or whom they have had the opportunity to physically contact.

If a child who is deafblind has some usable vision and/or hearing, as many do, her or his world will be enlarged. Many children who are deafblind have enough vision to be able to move about in their environment recognize familiar people, see sign language at close distances, and perhaps read large print. Others have sufficient hearing to recognize familiar sounds, understand some speech, or develop speech themselves. The range of sensory impairments included in the term "deafblindness" is great.

2. Population of the Deafblind

As far as developing world is concerned, there are not enough resources to provide health care and education for everyone. Disabled people, especially people who are deafblind, have little access to these services because of lack of awareness. In many countries, there has been little research, although we can assume that there are large numbers people who are deafblind. But no one really knows how many such people there are, where they are or what happens to them? In India we do not have any research or survey conducted regarding the population of persons who are deafblind but the Community Based Rehabilitation Projects have hinted that there might be around 2,50,000 persons with dual sensory /multi-sensory losses.

3. Major Causes of Deafblindness

The main cause of deafblindness in children in the developed nations, used to be Rubella contracted by the mother during pregnancy. There are still many causes including premature birth, birth trauma and number of syndromes as follows:

3.1 Syndromes and Genetic Conditions

a. Alport's Syndrome
b. Aper's Syndrome
c. Bardet-Biedl Syndrome
d. CHARGE Syndrome: In 1981, Dr. Roberta Pagon documented the series of characteristics now known as CHARGE. The collection of six multisystem congenital anomalies includes:

- **C**oloboma of the eye
- **H**eart malformation
- **A**tresia of the choanae
- **R**etardation of growth or development
- **G**enital abnormalities
- **E**ar abnormalities

Although some cases appear to be influenced by heredity, environmental factors have not been ruled out. Infants physically are fragile and often require repeated surgery to repair cardiac, palate, esophageal, and gastric complications. Hearing loss varies and is accompanied by outer-ear deformities. Facial palsy has also been reported in a significant number of cases (Huebner, 1995).

e. Cockayne's Syndrome
f. Crouzon's Syndrome
g. Down Syndrome
h. Duane's Syndrome
i. Friedreich's Syndrome
j. Goldenhar's Syndrome
k. Hunter's Syndrome
l. Marfan's Syndrome
m. Mobius' Syndrome
n. Neurofibromatosis
o. Norrie's Syndrome
p. Optico-Cochleo-Dentate Degeneration
q. Refsum's Syndrome

r. Trisomy 13-15 (Patau's) Syndrome: The chromosomes are found in pairs, in case of three chromosomes in the 13th pair is responsible for this syndrome. A significant percentage of children born with this condition die during infancy. Most of those who survive have severe mental retardation and marked physical characteristics. Varying degrees of auditory and visual complications may be present.

s. Trisomy 18 (Edwards') Syndrome: Trisomy 18 syndrome is recognizable in the infants, as the head is narrow and elongated, with a bulge at the back of the skull. Both visual and auditory complications are present. A very small percentage of infants survive to childhood. These children have low birth weight and fail to thrive. Females achieve longer survival rates than males.

t. Turner's Syndrome

u. Usher Syndrome: This is a genetic condition which affects hearing and sight. The hearing loss which is usually profound is apparent from birth while the sight loss may not be noticed until the individual has reached young adulthood. The vision becomes impaired when the retina stops functioning due to retinitis pigmentosa causing firstly, night blindness and then tunnel vision. Hearing levels, however, usually remains stable (Huebner, 1995).

There three types in Usher:

Type I: Profound hearing loss from birth, poor balance, retinitis pigmentosa noticeable before age of 10.

Type II: Partial-to-severe hearing loss from birth, normal balance, retinitis pigmentosa noticeable before age of 20 and

Type III: Normal sight and hearing at birth, when retinitis pigmentosa is diagnosed there can be mild-to-moderate hearing loss present. Both hearing loss and retinitis pigmentosa increase through adulthood.

v. Wildervanck Syndrome

3.2 Maternal Infections and Diseases during Pregnancy

Many maternal conditions, such as infection and disease contracted during pregnancy, can interrupt the normal development of fetus or newborn infants. If a woman contracts and infection during pregnancy, it may cause illness in the newborn or actual damage to the foetus resulting sensory, physical, or mental impairments.

3.2.1 TORCH Group: The parental infections diseases that most often cause congenital abnormalities known as the S(TORCH) group, for:

a. Syphilis
b. Toxoplasmosis
c. Rubella: It is also known as German measles, causes a group of congenital defects known as Congenital Rubella Syndrome (CRS). The disease is easily transmitted from pregnant mother to the unborn foetus. Since the development of the rubella vaccine, the incidence of congenital rubella syndrome has decreased dramatically in the developed countries. In the areas where rubella vaccine is not given, the incidence of disease may be higher.

A pregnant woman who is not immune normally contracts rubella through the nose and throat. The infection spreads, transmitting the virus to the foetus across the placental barrier. Once the foetus is exposed to the virus, the cells of the developing eyes, ears, brain, central nervous system, and heart can be damaged. Hearing impairment in congenital rubella syndrome is typically sensorineural but may include accompanying conductive problems (Huebner, 1995).

d. Cytomegalovirus (cytomegalic inclusion disease)
e. Herpes simplex (Huebner, 1995).
f. Aids

3.3 Teratogens (abnormal development of embryo)

The following factors may play a role in interrupting the normal development of a foetus. The factors represent the known effects on an otherwise normally developed foetus:

a. Prescription drugs
b. Drugs known to be Ototoxic (harmful to developing ear structure)
c. Illicit Drugs used during pregnancy
d. Other Teratogens e.g. radiations, pollution, toxic agents etc.

3.4 Prematurity and Low Birth Weight

Prematurity and low birth weight are associated with various following problems and complications during pregnancy:

- Mother is adolescent or pregnancy involves multiple births
- Location of placenta or the position of fetus in the womb
- Membranes rupture early
- Infection during pregnancy
- Mother has chronic illness, such as diabetes
- Toxemia (hypertension) of pregnancy
- Specific malnutrition or trauma to the fetus
- Less intake or over intake of oxygen.

Many premature infants develop respiratory distress syndrome which is co-related with blindness. Premature and low weight infants are at risk for other complications, such as intracranial hemorrhage, malnutrition, jaundice, hearing loss, and congestive heart failure (Huebner, 1995).

3.5 Infections during the Newborn and Infancy Period

Either following infections itself or inflammation caused to a newborn or infant can cause mental retardation, visual impairment, hearing impairment, neurimotor problems, or any combination of these:

a.   *Meningitis*: caused by bacteria, affects the blood and spreads rapidly to the cerebrospinal fluid, ultimately affecting the meninges, the layers of tissue covering the spinal cord and the brain. It may result in profound, bilateral deafness, likewise such an infection can cause visual impairment if the infection spreads to the visual pathways of the brain.

b.   *Encephalitis*: is an infection of brain tissue primarily caused by a virus, which specifically affects central nervous system tissue. Newborns are at risk for major complications from this infections simply because of the immaturity of the central nervous system.

3.6 Causes of Disability in Childhood

a.   *Diseases in Childhood*: Bacterial and viral infections seldom cause lasting visual impairment, and auditory system is much more susceptible to permanent damage. These diseases include measles, mumps, chicken pox, influenza, and the common cold. Usually in cases of high fever, damage to auditory system is caused.

b.   *Paediatric Trauma*: The eye is exceedingly vulnerable to injury. Trauma to the eye may occur when infants are shaken or hit above the head. Accidental injury also accounts for several types of hearing impairment in children. Both direct blows to the head and penetrating wounds of the skull cause damage to the auditory system, as does exposure to noise (Huebner, 1995).

c.   *Asphyxia*: Stoppage of breathing due to obstruction in the air passage.

d.   Seizure, fits etc.

Some people are deafblind from birth. Others may be born deaf or hard-of-hearing and become blind or visually impaired later in life; or the reverse may be the case. Still others may be adventitiously deafblind, that is, they are born with both sight and hearing but lose some or all of these senses as a result of accident or illness.

Deafblindness is often accompanied by additional disabilities. Causes such as maternal rubella can also affect the heart and the brain. Some genetic syndromes or brain injuries that cause deafblindness may also cause developmental delays and/or physical disabilities.

4. Needs of a Person with Deafblindness

Deafblindness is a combination of visual and hearing impairments and comes in varying degrees. Because 95 percent of all one learns comes through one's eyes and ears, deafblindness causes unique problems in communication, mobility and accessing information. A person who is deafblind must somehow make sense of the world using the limited information available to him or her. If the person's sensory disabilities are great, and if people in the environment have not made an effort to order the world for him or her in a way that makes it easier to understand, this challenge may be overwhelming. Behavioural and emotional difficulties often accompany deafblindness and are the natural outcomes of the child's or adult's inability to understand and communicate.

4.1 Perceiving Verbal and Visual Cues

The people who can see and hear often take for granted the information that those senses provide. Events such as the approach of another person, an upcoming meal, the decision to go out, a change in routine are all signalled by sights and sounds that allow a person to prepare for them. The child or adult who misses these cues because of limited sight and/or hearing may come to experience the world as an unpredictable, and possibly

a threatening place. To a great extent, persons who are deafblind must depend upon the goodwill and sensitivity of those around them to make their world safe and understandable.

4.2 Language Accessibility

The challenge of learning language is perhaps the greatest one that children who are deafblind face. It is also the greatest opportunity, since language holds the power to make their thoughts, needs, and desires known. The ability to use words can also open up worlds beyond the reach of their fingertips through the use of interpreters, books, and an ever increasing array of electronic communication devices. In order to learn language, such children depend upon others to make language accessible to them. Given that accessibility, such children face the challenges of engaging in interactions to the best of their abilities and of availing themselves of the language opportunities provided for them.

4.3 Mobility

A person who is deafblind also faces, further, the challenge of learning to move about in the world as freely and independently as possible. Adult individuals also must eventually find adult living and work situations that allow them to use their talents and abilities in the best possible way. The achievement of success depends largely not only on the severity of their impairments but also upon the education they received since childhood, and particularly upon the communication with others that they have been able to develop.

5. Needs of the Family, Teachers and Care-givers

5.1 Communication

The disability of deafblindness places unique demands upon families, teachers, and care-givers who must make sure that the person who is deafblind has access to the world beyond the limited reach of his or her eyes, ears and fingertips. The

people in the environment of such children or adults must seek to include them, moment-by-moment, in the flow of life and in the physical environment that surrounds them. If they do not, the child will be isolated and will not have the opportunity to grow and to learn. If they do, the child will be afforded the opportunity to develop to his or her fullest potential.

5.1.1 Conversation - a Good Communication: The most important challenge for parents, care-givers, and teachers is to communicate meaningfully with the child who is deafblind. Continual good communication will help foster his or her healthy development. Communication involves much more than mere language. Good communication can best be thought of as conversations that employ body language and gestures, as well as both signed and spoken words. A conversation with such a child may begin with a partner who simply notices what the child is paying attention to at the moment and finds a way to let the child know that his or her interest is shared.

5.1.2 Use of Touch: This shared interest, once established, can become a topic around which a conversation can be built. Mutual conversational topics are typically established between a parent and a sighted or hearing child by making eye contact and by gestures such as pointing or nodding, or by exchanges of sounds and facial expressions. Lacking significant amounts of sight and hearing, children who are deafblind will often need touch in order for them to be sure that their partner shares their focus of attention. The parent or teacher may, for example, touch an interesting object along with the child in a non-directive way. Or, the mother may imitate child's movements, allowing the child tactual access to that imitation, if necessary. *(This is the tactual equivalent of the actions of a mother who instinctively imitates her child's babbling sounds)*. Establishing a mutual interest like this will open up the possibility for conversational interaction.

5.1.3 Learning to Pause: Teachers and parents can continue conversations with children who are deafblind by learning to pause after the initial rapport has been established. These children frequently have very slow response times. Respecting the child's own timing is crucial to establishing successful interactions. Pausing long enough to allow the child to take another turn in the interaction, then responding to that turn, pausing again, and so on. This back-and-forth exchange becomes a conversation which if repeated consistently, builds relationships and become the eventual basis for language learning.

5.1.4 Use of Symbols: As the child who is deafblind becomes comfortable interacting non-verbally with others, she or he becomes ready to receive some form of symbolic communication as part of those interactions. Often it is necessary to precede the introduction of words with the use of simple gestures and/or objects which serve as symbols or representations for activities. Doing so may help a child develop the understanding that one thing can stand for another.

5.1.5 Language Stimulation: Think of the many thousands of words and sentences that most children hear before they speak their own first words. A child who is deafblind needs comparable language stimulation, adjusted to his or her ability to receive and make sense of it. The parents, care-givers, and teachers face the challenge of providing an environment rich in language that is meaningful and accessible to such child. Only with such a rich language environment, the child will have the opportunity to acquire language herself or himself.

5.1.6 Use of Communication System: Those around the child can create a rich language environment by continually commenting on the child's own experience using sign language, speech, or whatever symbol system is accessible to the child. These comments are best made during conversational interactions. A teacher or a parent may, for example, use gesture or sign language to name the object that he or she and the child are both touching, or name the movement that they share. This naming of objects and actions, done many times, may begin to give the child who is deafblind a similar opportunity afforded to the hearing child - that of making meaningful connections between words and the things for which they stand.

The principal communication systems for persons who are deafblind are these:

- Touch cues
- Object symbols
- Sign language
- Gestures
- Picture symbols
- Finger spelling
- Tadoma method of speech reading
- Large print writing and reading
- Braille reading and writing
- Lipreading speech

5.1.7 Predictable Routine: Along with nonverbal and verbal conversations, a child who is deafblind needs a reliable routine of meaningful activities, and some way or ways that this routine can be communicated to her or him. Touch cues, gestures, and use of object symbols are some typical ways in which to let a child who is deafblind know what is about to happen to her or him. Each time before the child is picked up, for example, the care-giver may gently lift his or her arms a bit, and then pause, giving the child time to ready herself or himself for being handled.

Such consistency in handling will help the child to feel secure and to begin to make the world predictable, thus allowing the child to develop expectations. Children and adults who are deafblind and are able to use symbolic communication may also be more reliant on predictable routine than people who are sighted and hearing. Predictable routine may help to ease the anxiety which is often caused by the lack of sensory information.

5.2 Orientation and Mobility

In addition, the child who is deafblind will need help learning to move about in the world. Without vision, or with reduced vision, he or she will not only have difficulty navigating, but may also lack the motivation to move outward in the first place. Helping a young child who is deafblind learn to move may begin with thoughtful attention to the physical space around him or her so that whatever movements the child instinctively makes are rewarded with interesting stimulation that motivates further movement.

Orientation and mobility specialists can help parents and teachers to construct safe and motivating spaces for the young child who is deafblind. In many instances such children may also have additional physical and health problems that limit their ability to move about. The parents and teachers may need to include physical and occupational therapists, vision teachers, health professionals, and orientation and mobility specialists on the team to plan accessible and motivating spaces for these children. Older children or adults who have lost vision can also receive help from trained specialists in order to achieve as much confidence and independence as possible in moving about in their world.

5.3 Educational Needs

Education for a child or youth who are deafblind needs to be highly individualized; the limited channels available for learning necessitate organizing a programme for each child that will address the child's unique ways of learning and his or her own interests. Assessment is crucial at every step of the way. Sensory deficits can easily mislead even experienced educators into underestimating (or occasionally overestimating) intelligence and constructing inappropriate programmes.

Helen Keller once said, *"Blindness separates a person from things, but deafness separates him from people."* This potential isolation is one important reason why it is necessary to engage the services of persons familiar with the combination of both blindness and deafness when planning an educational programme for a child who is deafblind. Doing so will help a child or youth with these disabilities receive an education which maximizes her or his potential for learning and for meaningful contact with her or his environment. The earlier these services can be obtained, the better for the child.

5.4 Inclusion in Family

Clearly the challenges for parents, teachers and care-givers of children who are deafblind are many. Not least among them is the challenge of including the child in the mainstream of family and community life. Since such a child does not necessarily respond to care in the ways we might expect, parents will be particularly challenged in their efforts to include her or him.

The mother or father of an infant who can see is usually rewarded with smiles and lively eye contact from the child. The parent of a child who is deafblind must look for more subtle rewards: small hand or body movements, for instance, may be the child's way of expressing pleasure or connection. The parents may also need to change their perceptions regarding typical developmental milestones. They can learn, as many have, to rejoice as fully in the ability of their child who is deafblind to sign a new word, or to feed herself, or to return a greeting as they do over another child's success. Parents, then, may need to shift expectations and perceptions in significant ways.

They also need to do the natural grieving that accompanies the birth of a child who is disabled. Teachers and care-givers must also make these perceptual shifts. Parents' groups and resources for teachers can provide much-needed support for those who live and work with children and adults who are deafblind. Such supports will help foster the mutually rewarding their inclusion into their families and communities.

5.6 Transition

When a person who is deafblind nears the end of his or her training/education, transition and rehabilitation, help will be required to assist in planning so that as an adult the individual can find suitable work situations. Because of the diversity of needs, such services for a person who is deafblind can rarely be provided by a single person or agency; careful and respectful teamwork is required among specialists and agencies concerned with such things as housing, vocational and rehabilitation needs, deafness, blindness, orientation and mobility, medical needs, and mental health.

The adult who is deafblind must be central to the transition planning, whenever possible. The individual's own goals, directions, interests, and abilities must guide the planning at every step of the way. Skilled interpreters, family members and friends who know the person well can help the adult who is deafblind have the most important voice in planning his or her own future.

6. Conclusion

Though deafblindness presents many unique challenges to both those who have visual and hearing impairments and to their care-givers and friends, these challenges are by no means insurmountable. Many persons who are deafblind have achieved a quality of life that is excellent and they have several things in common. First, they have each, in their own way, come to accept the absence of sight and hearing as a life situation which gives them a unique and valuable experience of the world. This fundamental acceptance can occur regardless of the severity of the particular sensory losses or other challenges that a person has. Second, they have had educational experiences which have helped them maximize their abilities to communicate and to function productively. Finally, these happy, involved persons who are deafblind live in families, communities, or social groups that have an attitude of welcoming acceptance.

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III. Visually Impaired Children with Multiple Disabilities (VIMD Children)

(By: Vimal B. Thawani, Project Coordinator, Blind People's Association)

Realizing the need for promotion of services for children with multiple disabilities, the Persons with Disabilities Act, 1995 has made a provision for establishing an Institution for Persons with Severe Disabilities. It also recognizes the need for promotion of comprehensive services for such persons. It also defines *"persons with severe disabilities"* means a person with eighty percent, or more of one or more disabilities.

1. Definitions

1.1 A Person with Multiple Disabilities

Is a *"person who has combination of two or more certifiable handicapping conditions whose impact is so severe that the educational needs of the person can not be met in a programme designed for the separate handicapping conditions"*.

Illustration: Under the IDEA, a child is considered multiply handicapped if she has two or more handicapping conditions that require educational attention. According to this definition, a child who has cerebral palsy which makes it impossible for her to write with a pencil and who also has low vision which makes enlarged print necessary for reading would be considered multiply disabled. A child with the same visual conditions whose reading skills are delayed for no identifiable reason would not be considered to have multiple disabilities (Erin, 1995)

1.2 Visually Impaired Person with Multiple Disabilities

Is a "person who in addition to visual impairment has at least one other disability, regardless of the extent of either, this combination of which causes such severe problems that they can not receive adequate services in the educational programme for visually impaired person or in those established for persons with other handicaps." (Bureau of Education, USA).

2. Characteristics of Persons with Multiple Disabilities

Best & Brown (1994) use the term 'multi-sensory impairment' to describe a situation rather than a condition, the situation being characterized by an individual being unable to:

- gather sufficient information from the environment to learn independently;
- make sufficient use of the environment to function independently.

Other characteristics of multiple disabilities are:

a.   Children with severe or profound learning disabilities have particular difficulty in separating relevant cues from irrelevant aspects of the environment (Ashman & Conway, 1989).

b.   Children have problems in retaining information in short and long term memory.

c.   It disrupts the processing of information and their abilities to organize problem-solving responses to a situation (Muldoon and Pickwell, 1993).

d.   There is interference in the basic abilities of early communication which include making eye contacts and attending to and interpreting facial expressions and body gestures (Kiernan et al, 1982).

e.   It affects interactive relationship with parents and caretakers who may be unable to understand the child's needs or intentions (Beveridge, 1989).

f.   Have acquired splinter skills - may have some high level skills but not able to do other more simple things.

g.   Such children need very structured instructions.

h.   They need a variety of supporters - a large and diverse support system.

i.   They have trouble with abstract thinking.

j.   They need to learn small steps with a lot of patience.

k.   Each child has her own temperament and her own set of experiences (Erin, 1995).

l.   Each child may be affected in different ways by a medical condition or physical disability (Erin, 1995).

m.   It makes it almost impossible to predict how much any child will learn and what she will be able to do as an adult (Erin, 1995).

3. Visual Conditions with Other Disabilities

Any of the visual impairments and conditions listed in Chapter II can occur with or without other disabilities. Several following visual conditions, however, almost always occur with another disability (Erin, 1995):

3.1 Cortical Visual Impairments

Are caused by an abnormality in the brain. The eyeball and other optical structure are often normal, but for some reason, the brain has difficulty processing and interpreting visual information. The damage that causes the visual impairment may result from the:

- loss of oxygen to the brain;
- bleeding in the brain; or
- other type of trauma.

The same injury to the brain may also result in:

- cerebral palsy
- mental retardation
- seizures, or
- language difficulties.

Such condition may have total loss of vision or low vision and use of vision often improves over time. Their vision may seem to change at different times of the day, they may seem to stare straight ahead or through things. They behave in a puzzling way.

3.2 Optic Nerve Atrophy

Affects the optic nerve which has been damaged in some of the following ways:

- It has not developed (Nerve Hypoplasia)
- It may fail to develop properly because of something that has occurred early in pregnancy.
- Mother's exposure to a toxic substance or an accidental change in the genes which can result in damage to other parts of the brain.

The children with optic nerve atrophy or hypoplasia have a loss of peripheral vision and can only see objects that are straight ahead of them; others lose central vision and may notice objects to the sides more clearly.

3.3 Other Conditions

Various other conditions can also affect both the brain and the visual system.

- Cyromegalovirus - a common virus that can damage child's brain before birth.
- Toxoplasmosis - a common parasite commonly tranmitted by cats which can invade the brain and eyes.
- Rubella can affect the developing foetus if the mother has illness in her early pregnancy.
- Anoxia - loss of oxygen to the brain can lead to brain damage.

The loss of vision caused by these conditions can range from a mild impairment to complete blindness. The children with visual impairment and brain damage may seem to use their vision differently at different times of the day. In addition, these children often have trouble with perceptual responses such as perceiving depth, remembering visual information, searching for objects they see, and identifying important visual information.

4. Impact of Multiple Disabilities

According to de' Jong (1992), population of persons with multiple disabilities may be considered to represent two categories of needs: the key words used to describe these categories are *"additive"* and *"interactive"*.

4.1 Additive Impact

Within this group, the impact of two or more disabilities on living and learning can be considered as additive or the sum of the impact of the separate disabilities. Approaches for persons with one of each of the represented disabilities can, therefore, be used in combination. An example of an individual representing this category is the child who is visually impaired and has lost his legs due to amputation. This child can be provided lower prosthesis and taught through the same methods used to teach other visually impaired children.

4.2 Interactive Impact

Within this group, the impact of two or more disabilities on living and learning can be considered as interactive. Thus, a combination of approaches from the single disability area would not be adequate to severe this person's needs; rather, a specific approach must be used. An example of an individual representing the category described as "interactive" is the child with visual impairment and cerebral palsy. The spasticity resulting from the cerebral palsy precludes the use of a tactile method which is traditionally used with a visually impaired child. As visual approach would be ineffective for this child, a new and unique approach must be developed.

For those children whose disabilities have an interactive impact on learning as well as functioning, new care and education strategies have to be developed. This is often difficult because those strategies developed to address the needs represented by one of the disabilities may exacerbate the needs presented by the child's other disabilities. For example, in case of deafblindness, due to combined sight and hearing loss, the person can neither be approached as a deaf person or as a visually impaired person. This multi-sensory impaired individual has to be perceived and approached as a person with the unique disability of deafblindness. Thus each interacting combination leads to unique needs and consequently individual specific approaches.

5. Needs of Individuals

The persons with multiple disabilities and a visual impairment do not form a homogenous group. The true extent of the visual function of such a person is frequently unknown and may vary depending on person's general health and physical condition. As a result guidelines for working with this population often offer only a general framework for appropriate intervention (McLinden, 1997). Every such child has a unique set of learning problems and his appropriate learning modes are different from other children. Faced with such a diverse population, a multi-pronged and multi-option approach has to be adopted (Mohit, 1995). Paul (1995) also supports this contention and feels that such person presents such a wide range of needs that no single professional or individual can cater to their needs alone. Therefore, a team approach should be used to design and implement a comprehensive programme for each individual.

The team should be composed of a variety of professionals, family members and other care-givers. Mohit (1995) also advocates that keeping in view the diversity of needs and all relevant

factors including onset and extent of disability, the age of the child, the socioeconomic status, family attitude and so on, a range of professional interventions, service delivery approaches and curriculum approaches are essential for implementing a comprehensive programme for each VIMD child.

According to Paul (1995), the multi-disciplinary team may consist of:

- Special Educator
- Physiotherapist
- Occupational Therapist
- Low Vision Specialist
- Speech Therapist
- Audiologist
- Orientation & Mobility Specialist
- Psychologist
- Vocational Counsellor
- Social Worker, and
- Family members.

It is essential to remember that each VIMD child is unique with his/her own distinct set of problems, learning abilities and residual skills. Some may need intensive and repetitive instructions in mastering of single skills while others may glide through (Paul, 1995).

6. Service Spectrum

Each disability hinders normal development in several ways. A combination of disabilities hinders in many more ways, which seems logical so far (de'Jong, 1995). But sometimes there are combinations of disabilities with very peculiar effects; in certain situations their compensation and approaches do clash together. They interfere in such a way that the well known approach cannot be used and a new specific one has to be created.

As the nature of interventions and services would depend upon combination of disabilities and many other factors, it is almost impossible to list a uniform set of services to be provided to persons with multiple disabilities. de'Jong (1992) has made an attempt on listing age specific primary needs of such persons:

6.1 Infants and Toddlers

The primary needs of young children with multiple disabilities (age birth to 3 years) include:

- early identification and child-find programmes;
- parent counselling and family services;
- home-based services delivered by persons with special training;
- medical and therapeutic services to enhance healthcare and motor development needs.

6.2 Pre-school Children

In addition to parental involvement and other above mentioned services, the preschool children should be provided services of:

- opportunity to participate in a day programme like a peer group;
- incorporation of specialized educational and medical interventions as per needs of children;
- availability of functional curriculum;
- cooperation between specialists and the care-givers.

6.3 School-age Children

The primary needs of school-age children include educational opportunities and services offered in a variety of settings viz.

- public school
- resource rooms
- residential schools
- and educational opportunities

The children must be provided specially trained teachers and specialized services on a direct service and/or consultative basis. All children must have access to materials, facilities, technology and equipment so as to ensure equal access and full integration into educational opportunities. The development of appropriate curricula to meet specific needs of these children should be emphasized.

6.4 Adolescents and Young Adults

The programmes for this groups should help to:

- remove social and environmental barriers;
- provide experiences; and
- impart social, self-help, vocational and income generation skills.

6.5 Adults

For this group "economic rehabilitation" should be an important goal. The focus of programme for this group should be:

- social integration;
- sports, recreation, social and cultural activities;
- vocational, on-the-job, craft training or any other training in income generation;
- job options, housing opportunities and support service; and
- appropriate concessions, facilities and legislative support etc.

6.6 Elderly Population

The primary needs of this group include:

- identification programmes
- home-based rehabilitation services
- health care
- recreation and leisure-time activities.

The focus of all these services should be social integration, development of functional skills, independence in activities of daily living and self-confidence. The ultimate objective should be to promote their economic independence.

7. Assessment of Children with Multiple Disabilities

As discussed earlier, each child with multiple disabilities is a unique one with specific needs, unique combination of disabilities, unique experiences and unique impact of the same.

There are number of standerised tests available for assessment but the question arrises whether these formal assessment instruments are comprehensive enough or not ?

The answer is partially "yes". However, much depends on the type of impairment and the purpose of assessment.

7.1 Aim of Assessment

For the purpose of comprehensive rehabilitation programme planning, the main aims of assessment would be to:

Clinical Assessment

- establish a base-line in order to identify strengths and weaknesses;

- reassess to record change in order to identify performance in different areas of activity and compare change in areas of curriculum;
- ascertain teaching steps in order to plan next steps in assessment of the learner; and
- suggest learning or curriculum objectives.

Different people have different expectations of the role of assessment. Within education, the purpose might be early identification, screening, prediction of performance, establishing whether a learner's performance deviates from the norms for some other reason.

7.2 Categories of Formal Assessment

Two of the most common categorize of formal assessment tools in use within education are:

- Norm referenced, and
- Criterion referenced.

7.2.1 Norm-referenced Assessment : When assessment is norm-referenced that is based on a sample population, it becomes testing. Results may than indicate if the learner performance deviates from the norm. A norm is a normal or average performance as devised from the standard sample of the population. Any norm is restricted to the particular population from which it was derived. Willard (1982) has argued that the learner's needs are not facts about people, but personal goals and things or activities valued by people. For learners who have special educational needs, the usefulness of testing can be suspected and their accuracy often questionable. It is right to remain sceptical and suspicious of this type of assessment and testing. But norm-referenced testing is not the only way to carry-out assessment.

7.2.2 *Criterion - referenced Assessment*: In some circumstance, criterion-referenced approaches have advantages over those which are norm-referenced. Close and explicit association between assessment and learning objectives allows for the fine tuning of observational skills. The aim is not to place the learner along some sort of continuum but to establish the standard or criterion to be aimed at. But under the surface of criterion referenced testing there are assumption about what constitutes "normal" child development. What Tobin (1994) Calls an *"internal checklist"* is drawn from educator's experience.

Although criterion-referenced instruments have advantages and they can also present problem of their own. The fact is that they are :

- relatively easy to produce;
- can require little in the way of validation;
- allow the designer to make her mark with the new assessment; and
- require little in the way of statistical knowledge to interpret.

Criterion referenced assessments sometimes becomes misleading and they should be used with caution. In short, norm and criterion-referenced form of assessment are rather narrow and formal in their application, depending on checklists, developmental scales and so on. There is place for observational assessment, with the educator observing behaviours, interpreting in the light of other knowledge about this and other leaners, and determining educational objectives. Only use of objective assessments without parallel application and enhancement of observational skills, will achieve a little.

7.3 Functional Assessment Approaches

Instead of abstracting tasks from settings, functional assessment tries to structure the environment to offer opportunity for observing skills in practical use. Functional approches assume that it is not possible to prescribe for each and every possible situation that may arise with a learner. There is no single correct answer or indeed a question.

7.4 Elements of Functional Assessment

- Functional assessment should include assessment of learner own constellation of abilities and disabilities; cognitive abilities, sensory perceptual abilities, memory, problem solving abilities and communicative abilities.
- How the learner functions in different environments ? That would include, classroom, home, play ground etc. Sometimes leaner performs well in one setting than the other, and with one teacher than the other.

Having identified personal factors and environmental factors, we would want to discover what resources are available. These might include a sibbling, a neighbour or a particular teacher; may be formal resources like availability of funds or time available for training staff and user etc.

One extremely important part of any assessment will be to identify which parts of the curriculum lend themselves to

incorporating other features. In the process of functional assessment, the assessor takes an active part in identifying these opportunities; they are not contained within artificially constructed catagories.

Assessment should allow for a mix of qualitative and quantitative methods, reflecting a world views that there is a pluralistic, dynamic and complex, approaching people in a value oriented way and recognising the inter relatedness of human activities (Aitken, 1995). In this view, assessment is not something done to a leaner at certain stages but a continous process of evaluation of the relationship between leaner goals and performances, the educator, the curriculum and its development and of the resources available (Aitken, 1995).

Assessment is an ongoing activity, rather than a single or static occurrence

8. Curricular Approaches

As for a person with multiple disabilities, it is essential to cope up with the learning environment, learning is a continuous process of adaptation. The developmental team functions as a bridge between the learning environment and specific needs of the individual. The team makes critical decisions as regard development of appropriate curriculum.

Hussey (1997) observes that the current educational philosophy suggests that curriculum framework for VIMD children will consist of three elements, the National Curriculum, a Developmental Curriculum and the Complementary Curriculum.

8.1 National Curriculum

The Central Scheme on Integrated Education of Disabled Children as well as the Persons with Disabilities Act desires all children with disabilities to be imparted educational instructions in the regular school. It however recognizes the specific needs of such children and provides for services of special educators and support of special educational devices. According to Hussey

(1997), one of the key principles of the National Curriculum is differentiation within a common framework. The impulse of these legislative measures is to promote a curriculum to be shared by all schools, rather than a discrete one for children with special needs.

Akhil (1995) suggests two curriculum approaches viz. "developmental" curriculum and "functional" curriculum. Hussey (1997) prefers the term "complementary" curriculum instead of "functional" curriculum.

8.2 Developmental Curriculum

It refers to learning of basic skills as in case of non-disabled children. It desires that development of curriculum for children with multiple disabilities should be based upon and in the same sequence as in case of non-disabled children. The content in this case is determined through the administration of tests and checklists based on performance and capabilities of non-disabled children.

According to Hussey (1997), the developmental curriculum is concerned with four fundamental (but not exclusive) areas of development:

- physical development (including development of body awareness and control of movement)
- social development (including promotion of the emergent personalities and development of acceptable behaviour)
- intellectual development - the promotion of awareness, understanding and knowledge
- communication development (promotion of the expressive and receptive skills needed in human relationship and learning.

According to Paul (1995), this approach has major advantages in terms of providing overall picture of child's abilities, providing common ground for comparison of development of children with or without disabilities. It has limitations in terms that children with severe disabilities do not develop skills in the normal sequence and materials and situations prescribed are not age specific and meaningful to a child with disabilities. It is also difficult to prepare and manage a child specific Individual Education Plan. The latest trend is to adopt and follow functional curriculum in case of visually impaired children with multiple disabilities.

8.3 Functional Curriculum

This approach is based upon the principle that access to education is often dependent on the ability of the child to explore his or her environment and to develop a communication system. This cucciculum may be delivered by a variety of professionals including speech therapists, orientation & mobility instructors, physiotherapists, psychiatrists, psychologists and special educators. A professional advises as to how their aim can be incorporated into a child's educational plan. Their role needs to be valued within the whole approach of the school. It provides holistic approach to each child's education.

According to Erin (1995) the most important skills for VIMD children to learn are functional skills. These are the skills that enable such child to do ordinary daily skills. These may be as simple as grasping a spoon or as complex as travelling to new a job independently. But in any case, the skills is something that will require assistance from any other person if the child can not learn to do it on his own. Thus it is essential to incorporate teaching of functional skills in the curriculum.

This approach is designed to determine skills required for a particular person in his existing and future environment. The persons are taught only those skills that will facilitate their integration into the natural setting. These skills must enable an individual to control, modify, interact and perform in the environment. The areas taught in this approach include skills

of independent living, self care, recreation/leisure, education, vocational activities etc.

The approach is based on the principle that the functional skills can be effectively learnt when taught through a pre-planned and structured programme. The children in this case are taught skills which are age appropriate through relevant materials and best suited sequence.

Akhil (1995) recommends the following procedure for developing a functional curriculum:

a. Parent interview
b. Student preference survey
c. Ecological inventory
   ● Dividing the curriculum into domains
   ● Determining the environment
   ● Dividing each environment
   ● Determining the specific activities
   ● Determining the skills
d. Discrepancy analysis

The functional approach is realistic, practical and effective. It may seem time consuming to begin with. It however reduces the time that otherwise would have been spent later.

It is thus essential to work in partnership with the individual and their families to provide a realistic educational programme suited to each child's specific individual felt-needs.

9. Vision Stimulation Room

The Blind People's Association with the design support of the National Institute of Design and financial support of the Sense International has set up the Vision Stimulation Room with three objectives:

● Sensory Stimulation of children with multiple disabilities
● Sensory training in use of residual abilities
● Assessment -clinical and functional aspects

The room is equipped with

● Strobes, flasher lights, spotlights, mirror ball, focus light, ultraviolet lights to measure tracking, fixating and use of vision,

- Resonance boards, stimulation box for stimulating toddlers, vibrators, sound devices of different frequencies and intensities.
- Tactually stimulating surfaces of different qualities arranged in the room to stimulate the child and encourage it to explore with its sense.
- Suspended objects of different surfaces, lengths, textures to encourage the child to explore feel and process this information meaningfully.

The Room has been designed by the National Institute of Design (Ahmedabad) and developed under the guidance and with the support of the Sense International. The room has myriad of lights of different intensities and qualities from strobes to ultraviolet to flashers. These are arranged in specific places from the ceiling, floor and walls to assess the extent of residual vision and also effectively measure the extent of gaze fixation, tracking and moving. The lights are also used for stimulating children with low vision to effectively harness vision. The room encourages the stimulation of the other two senses of touch and hearing equally. There is a tactile corner and a resonance board for stimulating the tactile senses of especially young toddlers.

The room also has installed a variety of auditory devices for encouraging the use of residual auditory abilities and for harnessing senses for identifying, discriminating and processing sounds, its origin and quality. With the stimulation, the child learns to understand its residual ability and to use the same in day to day life. The sensory stimulation room thus helps in concept development and communication through other senses and integration of different sensory information.

Achievements: This design for this project has been developed by the NID at no cost. No budget, no developmental cost, no cost to S&T Mission. This is the most well designed Vision Stimulation Room in the country. The Sense International is now sharing details of the design with its partners around the world.

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