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MAN POWER DEVELOPMENT FOR CONSTRUCTION INDUSTRY

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1.0 INTRODUCTION

1.1 Construction Industry accounts for a large percentage of the outlays of our economy as it contributes to the developmental potential for all sectors of construction; be it in multipurpose projects, highways, roads, canals, power sector, industrial sector or building construction including housing. There are over 2.5 crores of construction workers in the country covering unskilled, semi-skilled and skilled levels constituted by masons, carpenters, bar benders, plumbers, electricians, tile layer, glass fitters, concrete workforce, etc.

1.2 Construction skills were transferred from father to children on a hereditary basis, more so for skills of masonry and carpentry. These have undergone changes over the years and construction skills are now acquired by the workers as a part of the on-the-job training. They come to the Construction Projects as unskilled workers and over a period of time working with the main mason at the construction site, acquire levels of some skills which would take them into the semi-skill levels and over the years become a skilled worker. Normally a learning curve of the order of 5 to 10 years

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is needed for the transformation. As a result, their productivity and quality of work in the initial period are also reflected in the work progress.

- 1.3 Unlike other formal education system for higher order manpower development, namely architects, engineers and specialists coming through various educational avenues like polytechnic, engineering colleges, architectural schools, technology universities and acquiring either diploma, degree or postgraduate degree or doctorate, the construction workers have been left more or less uncovered.
- 1.4 Even the efforts of the Industrial Training Institutes started long back had proved to be of no consequence for construction industry. The minimum educational qualifications needed for entry into ITI and the time period of training has made the ITIs increasingly irrelevant to the needs of the construction industry. Even those who would have undergone training programmes for masonry, brick laying or carpentry have only turned out to be supervisors in the field of work and not produced the actual skill levels needed for construction.
- 1.5 What is, therefore, required had been a fifth level of training institutional network below the universities, colleges, schools, polytechnics/ITIs which can take into its arms the training needs of illiterate or semi-literate aspiring construction worker to whom hands-on

work experience can be given for various building trades. India never had such a grassroot level training institution for the construction workers excepting for the initiatives of the Building Centre Movement launched in 1988 through the National Network of Building Centres (Nirmithi Kendras/Nirman Kendras). Some of the salient aspects of the training for construction workers inducted through the Building Centres of India are highlighted under item 2.

2.0 TRAINING FOR CONSTRUCTION WORKERS THROUGH BUILDING CENTRES

2.1 Training will be given to the local workers to familiarise them with conventional/innovative technologies. Training in Building Centre is given for 3 classes of workers : skilled, semi-skilled and unskilled on different construction work areas. The training duration will be different for the three groups;

a) For skilled mason/carpenters/barbenders - 2 to 3 months training on upgrading skills in the field of new technology and alternate building materials.

b) For semi-skilled the training period is 4 months.

c) For unskilled and unemployed rural youths the training period is 6 months. In this period an indepth training will be given to them on various technologies and alternative products.

The ideal age group for trainees :	
Skilled labourers	- 30 to 40 years
Semi-skilled labourers	- 20 to 35 years
Unskilled labourers	- 15 to 20 years

- 2.2 Selection of Trainees can be made from each block of the District, preferably from construction industry. This helps in propagating the low cost technologies to as large a spread as possible. The initiatives for selecting the workforce must be taken by the village level Extension Officer/ Builders Associations/Construction Workers Organisations through a panel. After that, the final selection will be made by the Building Centres Governing Body.
- 2.3 The size of the batch is to be limited so as to ensure the effective training. It should be around 20 per batch. Certain special applications like Ferrocement etc. should have smaller groups of 10. During the period of training, the trainees will be given monthly stipend not less than the minimum wage for the workers. Semi-skilled workers will be paid 50% of the stipend for skilled labourers. This can be covered from the grants for training and the labour component of costs for production/construction.
- 2.4 The trained youngsters are encouraged to form themselves into the Building Centre Rural Housing Cooperatives with their area of operation, confined to

the respective community development blocks... They will disseminate technology to willing recipients for undertaking construction utilising various housing alternatives. During training their services are used for production of building components and construction of houses/buildings.

What has been good about the training imparted in the Building Centres is that in addition to exposure on traditional and conventional construction systems, considerable exposure has also been given on new and innovative building materials, technologies and construction techniques to the workforce which helped in "Lab" to "Land" technology transfer.

2.5 Another major initiative for imparting training to the construction workers has been through the Nehru Rozgar Yojana Training programmes for construction workers for imparting training to 15 construction trades and 8 manufacturing trades. These are being imparted through either Building Centres or other local level training network in the Palika Karigar Kendras/some ITIs or other institutions including NGOs. The details of trades for such training is as given in Annexure-I.

Stipend funds are available for taking care of the funds required for the trainer, trainee, training inputs for NRY Training Component. The programme is proving to be quite popular.

2.6 Another initiative taken by the Directorate of Labour and Training in some of the States is to provide booths for availing the services of the construction workers namely mason, carpenter, plumber, electrician. The Maintenance Services Booths are provided in residential neighbourhood with clear cut enclosure space given to each one of the trades and their services can be availed by the neighbourhood community either through the telephone or through card system.

2.7 A major issue that requires to be sorted out in the Indian context is to diversify the nature of the training network through various initiatives of Building Centres which can be through the Governmental/District initiatives/NGOs, housing agencies, Contractors' Associations, Construction Workers Cooperatives, etc.

There has been some good initiatives for imparting training to construction workers done by Habitat Polytech, Nirman Mazdoor Panchayat, Tamil Nadu Manila Kattida Thozhilalar Sangam and some NGOs also specialised in imparting training to urban and rural poor on construction related trades, primarily for carpentry, welding, plumbing and electrical work.

2.8 The second issue is related to issuance of Certificates which can be recognised by the Directorate of Labour and Training of each of the State Governments for various trades. This would give the much needed

recognition for the skill levels of construction workers and the institute imparting training and also ensure the quality of work by availing the services of trained construction workers.

2.9 The paper also identifies some of the initiatives taken in Singapore for imparting training to the Construction workers through the Construction Industry Training Centre (CITC) and details of the same are given under item 3. Sri Lanka has also played a major role for imparting training to the construction workers through the Construction Industry Training Project and subsequently by the Institute for Construction Training and Development. Details of the same are given under item 4.

3.0 WORK OF CONSTRUCTION INDUSTRY TRAINING CENTRE OF SINGAPORE:

3.1 The CIDE has also set up a unique Construction Industry Training Centre (CITC) with a view to address the problem of shortage of skilled workers and to train and upgrade skills, quality and productivity for construction workers and supervisors to contribute to housing and building construction. The CITC provides full time institutional skill training for young people entering the construction industry. It has also got a programme for continuing education and training to update and upgrade the skills and knowledge of construction workers and supervisors. Consequently

CITC has been able to establish skills, standards and certificates in construction skills under the National Construction Trade Test programme. As a result, the Government has been able to insist that the builders use only trained construction workforce with appropriate construction trade certificates given by CITC. There are disincentives for building contractors to use construction workers without the proper trade certificates.

3.2 CITC, over the last 8-1/2 years (established in January '84), has been able to conduct courses on brick laying, reinforcement work, form work, electrical installations, plumbing, scaffolding work, finishing trades, equipment operation courses, pipe fitting, drain laying, etc. For those who are already in construction programme, there is a new programme for "fast track" training with reduced time period of exposure. The CITC has been, thus, able to play a very major role in imparting appropriate skill levels for traditional and modern and innovative building materials, technologies and construction systems and also use of improved and efficient tools, leading to increased productivity, quality assurance and safety.

3.3 The CITC now imparts training and conduct tests and awards Certificates to 19 trades as given in Annexure-II.

4.0 DEVELOPMENT OF CONSTRUCTION SKILLS FOR ARTISANS IN SRI LANKA

4.1 Work of CITP :-

Sri Lanka had developed a good programme for imparting skills on various construction trades to masons, carpenters, bar benders, plumbers, etc. as part of the human resource development programme. Right at the young age, a vocational training development component, has been launched under the Construction Industry Training Project (CITP) in 1982, normally boys and girls (mostly boys) who have completed 8th grade education are given the training under the National Apprenticeship Scheme for various construction skills. These are normally done in technical institutions at Kandy, Galle, Colombo, Jaffna and Ampara. The programme consists of roughly six months both at institution and site. At the end of the Training programme, a certificate is given alongwith a tool kit.

4.2 Work of INCTAD :

From 1986, the Institute for Construction Training and Development (INCTAD) based in Colombo have taken up this programme with additional thrust to cover areas of operation of equipments of construction heavy machinery operators with a unit at Anuradhapura. The enlarged programme is for one year 4 months with institutional exposure of 2 months, 9 months site exposure, additional one month institutional training and four

months site work. INCTAD is under the jurisdiction of the National Housing Development Authority. It is noted that nearly 60,000 artisans have been imparted training and they get back for the development programme in various villages under the Gamudava programme.

5.0 CONCLUSION:

5.1 Certificates: What is, therefore, needed is to arrive at a national programme for imparting training for manpower development for construction workers including supervisors through the Network of Building Centres and other similar training platforms available. The related issue is according recognition for the training through issuance of Trade Certificates by recognised Bodies of the Directorate of Labour and Training or Directorate of Technical Education through the recognised Training Institution by them. The corrolary lies in availing of only trained Construction Workers over a period of time by the Construction Industry for ensuring not only the quality of work but also efficiency and productivity in the work output. Equal amount of trained workforce, both men and women, would, therefore, be available for all levels of construction workers.

5.2 Improved Tools of Productivity : Alongwith the training being imparted, there is a felt need for identifying the nature of improved tools, equipments,

machinery, which would bring increased productivity and safety to construction workers than the existing tools available. This could cover the nature of trowels and other tools for a mason for improving his masonry skills or for that matter, chisels, hammers, screw drivers, pliers of various shapes and design which would bring less strain to the construction worker but also ensure substantial quality of work. Substantial work has been done in various countries and it is desirable to have manufacturing units for manufacture of equipments and machineries and tools for making the work of the construction worker more efficient and also more safe and productive. A special group can go into the details of identification of such tools.

City based Building & Construction Trades under
NRY Training Component

(Illustrative List only)

A. Servicing Trades

1. Carpentry
2. Plumbing
3. Masonry
4. Joinery
5. Tile laying
6. Other special trades based on local/vernacular construction methods
7. Electrical Wiring
8. Painting & Polishing
9. Truss making
10. Bar-bending & Steel fixing
11. Welding
12. Machine Operators and Mechanics
13. Glass-pane fixing
14. Wall paper fixing
15. Repair of domestic fittings and fixture

Any other similar trades related to housing and building can be added based on local practice and conditions.

B. Manufacturing Trades

1. Door & Windows (Shutters & frames)
2. Concrete or stone masonry blocks for walling
3. Soil-stabilised block-making
4. Hand-pressed bricks/tiles
5. Ferro-cement storage tanks, roofing components, shutters etc.
6. Small pre-fabricated components for walling, roofing, kitchen sinks, shelves etc.
7. Furniture items
8. Steel grills, gates and rolling shutter making

Other similar activities depending upon local requirements can be included.

LEVELS OF SKILLS/TRADES ORGANISED BY CITC, SINGAPORE

I. Advanced Builder Certificate

Structural Trades
Finishing Trades
Plumbing & Pipefitting

II. Builder Certificate

Reinforcement Work
Formwork
Bricklaying
Plastering
Tiling
Plumbing & Pipefitting
Building Electrical Installation

III. Skills Evaluation Certificate

Reinforcement Work	Formwork
Bricklaying	Plastering
Tiling	Plumbing & Pipefitting
Concreting	Drain Laying
Marble Laying	Pavement & Kerb Construction
Glazing	Roof Waterproofing(Felt System)
Joinery	Painting
Metalform	Metal Scaffold Erection
Construction Plant Operation (Loader Shovel, Excavator, Bulldozer)	
Tower Crane Operation	