



INTEGRATED DPR

FEASIBILITY STUDY ON
UPGRADATION OF IICT, BHADOHI TO A NATIONAL LEVEL
TEXTILE INSTITUTE OF UNIVERSITY LEVEL



Indian Institute of Carpet Technology

Bhadohi, Uttar Pradesh, India



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INTRODUCTION

Indian Institute of Carpet Technology

Knowledge and Technology Partner to the Industry

INVITES

INDUSTRY/STAKE HOLDERS TO EXPLORE PORTFOLIOS :

1.HRD, 2.DCD, 3.R&D AND 4.TSI TO ENHANCED THEIR PERFORMANCE



Indian Institute of Carpet Technology (IICT), Bhadohi, an institute with difference was conceived, by Ministry of Textile (MOT), Govt. of India (GOI) in eighties. IICT was

given the autonomous status in December 1998 through formation of society. Involvement of broad based stakeholders/authorities include Govt. of UP, Industry, Academicians, Industrial experts, statutory bodies/authorities like AICTE, University, NABL, IFW-MOT, experts from all region of the country in the Executive Committee Chaired by DC (Handicrafts) resulted role clarity and achievements.



Administrative Building of IICT

"IICT has always been at the forefront whenever there was a need of human resources and technology assistance to the industry."

Dr. KK Goswami, Director, IICT

Role IICT played for Carpet Industry:
IICT played its role through created portfolios exclusively for carpet industry are depicted below:

IICT PORTFOLIOS

1. HRD

(Human Resource Development)

Introduced long term training like B.Tech & Diploma course.

B. Tech Course in Carpet and Textile Technology (CTT): Started in the year 2001. Thereafter, specializations in Advances in Carpet Technology (ACT)/ Home Textile Technology (HTT)/ Textile Design Technology (TDT) have also been

integrated to B.Tech in CTT with the due approval of A. K. Technical University, Lucknow and accreditation to Textile Institute, Manchester, U.K. IICT has been awarded twice Star performing institute of the University.

[More Details please visit www.iiict.ac.in](http://www.iiict.ac.in)

373 Students serving the trade which includes higher studies in premier institutes like IITs, NITIE, ISM, IIM, NIFT

[More Details please visit www.iiict.ac.in](http://www.iiict.ac.in)

252 students are under going graduation. Every year 60 students are available for placement w.e.f. July month Industry to come forward & utilise these resource.

Futuristic plan: It has been

possible to draft the futuristic plan which includes introduction of M.Tech in Carpet & Textile Management with 20 intakes and Ph.D. Programme covering Pre Ph.D. Course Centre for Textiles at IICT. More labs are also going to be created to cover advanced and novel activities like advanced Carpet & Home textiles manufacturing, Fashion/ Style/Texture, Designs, Information Technology EDP, Personality Dev./ language skill including foreign language other than English.

In this endeavor a holistic approach of repositioning of IICT will be made. The DPR for Phase III expansion in hand to reflect the roadmap.

[More Details please visit www.iiict.ac.in](http://www.iiict.ac.in)

International Distance Learning Programme (IDL P)

Certificate/ Diploma course through International Distance Learning program (IDL P) in collaboration with AG Research, New Zealand duly approved by DEC,IGNOU, MHRD, Govt. of India.

Students' enrollment in process. Working person at large can take benefit.

Short term courses

More Details please visit www.iict.ac.in

Tailor made Industry driven Short Term Training programs run time to time.

MES based:

Application of Computer and IT in Carpet Manufacturing. Carpet and Textile design using CAD

Carpet Yarn Dyeing

Carpet weaving

Spinning of woolen yarn

Washing & Finishing of Carpet.

More than 5000 persons have been trained so far to mitigate the skill gap.

Through ISDS : 566 have been trained & other 2000 are expected to complete by 2015 covering above mentioned 6 MES.

Through CHCDS: 3500 have been trained till date covering carpet weaving and another 1500 to be by the waving and other desired MES shortly.

Askill india-move, the industry to utilize these skilled manpower to mitigate the skill gap

Industry to come forward and desire demographic dividend

(Job Creation and Skill Enhance - skill India in carpet and textile sector to supplement Make in India).

3. R&D

2. D C D

(Design Creation & Development)

Design Bank Created- More than 15000 designs are in place out of which around 3500 designs have been utilized by industry for commercial purpose. The variety of Design Bank includes Traditional INDIAN Motifs (Like : Harappa, Ajanta, Mughal, Rangoli, Jaipuri, Fulkari, Kantha, Paithani, Kalamkari, Banarasi, Jamewar etc.), modern motifs etc. as per trend.

Industry at large to come forward, advice and take more benefit of bank, creativity and development - global value at local cost.

(The above initiatives could focus on design creation and skill enhancement integrating Indiya collection an attempt to propagate Indian motif in carpet and textile sectors to supplement Make in India)



(Research & Development,

Product Development:

Quite a few product development activities has been done at institutional level and or in collaboration which includes:

- Coir Based Carpet:
- Silk Carpet:
- Eri silk Carpet:

- Modacrylic based carpet:
- Handmade Astroturf type Carpet
- Natural fiber based carpet:
- Natural dyeing:
- Organic product.
- Substitute to polyester shaggy:
- Bujbun Utilization:
- Vertical Blind
- Coir Paper and Coir Silk:

Another revolutionary research supported by CCRI Alleppey, Kerala of Coir Board, Kochi is continuing for coir silk. Commercial Stage trials with reputed Rayon Manufacturing co.(Grasim & Century Rayon) are being undertaken. The value addition will benefit coconut growers and support industrialization for coir paper & coir silk Production in coconut production intensive states like Kerala, Tamilnadu of the country.

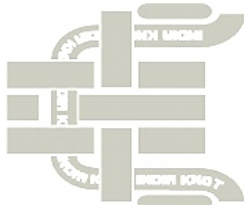
▪ Concept of Ergonomic and Flexible Tufting Frame:

▪ Cross Bar Horizontal Loom CBHL (Wooden or Metallic) for Hand knotted and Tibetan, Shaggy, Soumak etc - A proprietary move on supplement to Make in India Mission- Industry to come forward and explore



Weavers enjoying the comfort while working in CBHL

▪**India Knot:** A proprietary one of IICT which permits semi knotting its loom supplement to Make in India Mission - Industry to come forward & Explore

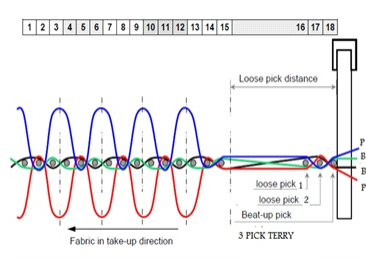


▪**Snehabha Carpet Backing System Polymer Backing Technology:** Light weight, Washable Reported it's features & feasibility in publications like carpet e world



▪**Terry leno Structure** :Another proprietary Make in India move to provide a new / cost effective carpet terry structure

The benefit of this R&D concept can be taken by carpet & Home textile includes towel industry at large to enhance their market/ market share/performance.



▪**Universal relation amongst diameter and linear density:** A published academic activity to supplement Make in India Mission :



TSI
(Technical Service Support to Industry)

17170 testing services provided to industry so far.

Consultancy provided to many units & organizations of repute. Further local industry units have derived free liaison visit/ trouble shooting service of IICT. which has benefitted them for instant solution their problem.

Space for photograph Laboratory activities

IICT Laboratories are accredited to NABL (ISO 9001.2008). Industry can take benefit of accredited facilities of global level testing/certification at local cost

More Details please visit www.iict.ac.in

Recognized expression for predicting yarn diameter

$$d'' = \frac{1}{28\sqrt{Ne}} \text{ By F.T. Pierce, JTI 1937}$$

Revision of above to mitigate the limitation

Deduction of Universal Relationship

1. $d(\text{inch}) = \frac{1}{29.25\sqrt{Nec \times \sqrt{\rho_1}}}$ 2. $d(\text{cm}) = 1130 \times \sqrt{\frac{ld}{yd}}$

3. $d(\text{inch}) = 0.445 \times \sqrt{ld \times yv}$ 4. $D = \left(\frac{M}{11.89}\right)^2 \times \rho$

By K.K. Goswami, Melliland international, December 2015



Indian Institute of Carpet Technology

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Contact Details for exploration of portfolio wise output of IICT



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SALIENT CONTRIBUTIONS – PATENTS AND PUBLICATIONS

SALIENT CONTRIBUTIONS – PATENTS and PUBLICATIONS

The institute has remained credible in research and development as evident from patents and publications. Few salient patents and publications are –

1. Indian Patent Number 211 274 for the invention entitled “ New Polymer Sheet Method, thereof and method of backing carpet or such thick fabric material with the same”
2. Indian Patent Number 214269 for the invention entitled “ A machine for backing carpet”
3. Trademark registered for above mentioned patents vide copyright number 1478866 & 1478867
4. Indian Patent Number 2796/DEL/2006 for the invention entitled “ Cross Bar Horizontal Loom”
5. Indian Patent Application number 34/KOL/2008 for the invention entitled “New Pile / knot formation”
6. Trademark registration of above as India Knot.
7. Copyright on CARPCOST software tool for cost control application filed.
8. Method of regenerating cellulose from coir fiber vide application number 149/KOL/2012
9. Method of developing sprout / stretch registered pile integrating terri and leno mechanism for producing value added towel and carpet vide application number 3755/DEL/2015

PUBLICATIONS:

More than 40 include publication in International Journals like Textile Asia, Melliand Textile Berichte.

Publication include:

1. Woolenization of Jute as an Outlet for Jute as a alternative blanket
2. Carpet related publications, which include wool fibre, woolen yarn and carpet in wool perspective:
 - How to prevent slippage of Yarn in Fabrics?
 - How to prevent cockled appearance in Fabrics?
 - Optimization of Polyester/ Viscose Blends
 - Comparative study of the physical and mechanical properties of flat and Texturized Yarn Fabrics
 - Feasibility of setting up of 100 percent export oriented silk
 - Concept of polyester Filament Yarn Weaving
 - Studies of Blends with Special Reference to Acrylic Fibre as a partner
 - Outlet for Jute? Woolenized Jute & Viscose Blends
 - A study on value Loss
 - R&D Achievements claimed during last 3 years
 - Relationship between winding Breaks and Uster Classimat Faults
 - Effects of Alkali on Linen,

- Bleaching of Linen
- Flame Retardant Products – An in house R&D Effort for Defense end use – Symposium of Defense Textiles
- Report on Symposium on Defense Textiles
- Successful Development & Commercialization of pre-bleach (Linen) Technology
- Linen – An outstanding natural fibre,
- Bleach Lots Integrated,
- SEM and IR Studies on Linen
- Quality System Standards – A Management Approach towards TQM
- Industrial Textiles – An Overview,
- Total Quality Management – Its Principal and Approach
- Oxidative Bleaching System of Linen,
- Indian Carpets – Attracting Buyers Worldwide
- Carpet & Allied Textile Industry - Globalization Context
- Carpet Designing- An Overview
- Carpet Industry in View of Global Challenges
- Carpet yarn and Quality Control
- Carpet, Textiles, Handloom-In Retrospect & Prospect
- Colour - Application, Matching, Computerization in Carpet Perspective
- Handmade Carpet Industry
- IICT – A support to Carpet Industry
- Wool in Carpet Perspective
- Yarn in Carpet Perspective
- Carpet – A Potential sub-sector of Textiles
- CARPCOST – A software for Cost &Quality Control.
- Unpublished work/ Project involvement covers Natural fibers like PALF, COIR, BANANA, SISAL and Natural Processing: Dyeing/ Finishing

**Handmade Carpets:
The Potential for Socio-economic Growth**

**Sandeep Srivastava, Additional Development Commissioner (Handicrafts), Office of
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Handmade Carpets – Potential for Socio-economic Growth

Sandeep Srivastava and K.K. Goswami

Abstract

The handmade carpet industry is a labour intensive one involving millions of artisans/craftspersons. Indian handmade carpet industry occupies a significant position in the world handmade carpet industry in particular and the international floor covering trade in general. The country with a population backed by skill and inclination towards such craft activity has a strong potential for growth. Engaging in such activity produces gainful employment resulting socio-economic growth. The handmade carpet industry is thus a potential socio-economic growth for any such country and the world at a large.

Key Words: Handmade Carpet, Labour Intensive, Skill, Craft, Gainful Employment, Potential, Socio-economic Growth.

Introduction

The handmade carpet industry in India has about a 1% share of the total Global demand of Carpets. In recent years the handmade carpet sector has shown great improvement in relevant areas such as: competitiveness, capacities, delivery time and standardization.

India, with the help of more than 2500 exporters-cum-manufacturer and two million artisans, is ready for a big leap. Many major chain stores and department stores overseas are looking to India as a potential direct source for handmade carpets. Handmade carpet belts in India (maybe globally) lack infrastructural facilities, marketing and commercial support, and government support to achieve potential growth. This industry faces the problem of non-tariff barriers because of their insignificant size. The industry is not united, and does not have lobbyists to secure and promote its cause. The requirements of

WTO, ILO, human rights organizations, environment regulations are such that an underdeveloped country cannot meet them.

In this regard, the socio-economic conditions of the people of carpet-producing areas must be kept in mind. It is pertinent to mention that handmade carpets as a handicraft item were once of great aesthetic value. The beauty of traditional handicrafts such as handmade carpet should not be forgotten in the light of technological intervention. The craft – its beauty, labour intensiveness, the socio-economic conditions of the artisans, the availability of skill artisans, infrastructural set up, etc. – as indicates the potential scope of the sector. The simple existence of potential, however, may not yield desired growth until relevant organization are taken to establish economic targets and strategies for growth. Millions of artisans are already involved and many more millions can be included in the sector, providing opportunities to afford domestic economic development and enhance world trade.

The Handmade Carpet Sector: History and Prospects

Indian handmade carpet industry exports products worth around 3,000 crore INR. The global market for exports is reported to be around 10,000 crore INR. India's share of the volume is the largest, but the value of these products stands third, indicating the realization of a low unit value. The share of India volume wise highest but value wise India stand third which indicates Unit Value Realisation is lower.

By comparison, Pakistan's carpet exports are reported to be valued at around 1000 crore INR. Interestingly, Pakistan's business is only in handknotted carpets and not in other variety like hand tufted, loom made etc. Diversity and the ability to meet customers' requirements makes India's potential to increase its volume and value much further.

There is a feeling that India alone can reach the goal of 10,000 crore INR in exports in the coming five years. Moreover, the large domestic market including meeting/creating the demand for handmade carpets among consumers including railways, hotels, airports, and corporate offices may be a boon for the Indian carpet industry. To achieve the

projected potential growth, much effort is required to ensure the resurgence of this vibrant sector in the interest of artisans and the domestic economy as a whole.

Methodology

The following steps initial steps are suggested:

- Strength – Weakness – Opportunity – Threat (SWOT) Analysis: scientific analysis of the industry must be made through a systematic survey and made available by IICT to the industry;
- Action plan over SWOT information and database:
An initial consideration of the means, financial implication and expected impacts must be undertaken;
- Studies of raw material requirements, processes, product upgrades and capacity building must be completed;
- Quality and quantity assessment vis-à-vis price and grades of raw material must be done in order to improve indigenous varieties and reduce imports;
- A raw material bank must be established to manage raw material qualities and supply;
- Process reengineering must be accomplished to ensure cost control, productivity enhancement, eco-friendly and socially accountable methods of production;
- A contract review system must be put in place;
- Customer-centred internal process controls must be introduced.

Next, a system of product-upgrading benchmarks must be initiated using two levels of data basing:

- Inter firm comparisons to create a database for 5%, 25%, 50%, 75% & 95% levels;
- The application of the database to grade the product according to both subjective and objective parameters in any group (5% to 95%);
- The extension of inter-firm and national standards to the international level.

Capacity building must address four main issues: human capital, networks, customer orientation, and research and development.

Human Capital

- The industry must employ human resource strategies that focus on hiring qualified artisans and treating their skills as a form of capital;
- Incentives should be given to employees to maintain and improve their skills, perhaps through distance-learning programmes.

Networking

- Surface Networking must be developed so that each and every carpet belt may be considered as priority area for surface networking improving connectivity in terms of roadways and/or railways to improve the efficiency of the movement of people and materials;
- Information Networking which emphasizes Internet amongst all clusters through a suitable planning initiative should be used to share information about available resources;
- Information Network: Internet connectivity should be established amongst all clusters

through a suitable planning process using the NIC or some such organization to obtain and disseminate information about available resources and resource utilization, delivery and production;

- Utility Services: Reliable and adequate amounts of electricity and high quality water need to be ensured.

Customer Orientation

- Buyer-seller Interface: A primary focus on customer needs and satisfaction is essential to business success.

Quality Control and R & D

- The industry must be encouraged to create a Quality Control and R & D culture. The expenditure on investment should be taken from institutions such as IICT and suitably re-paid.

Strategy

- Raw material base has to be stressed at the outset. This will enable strengthening our own raw material sources and overall raw material management (i.e., graded

wool consumption through a certified raw material bank), which is the first step toward successful brand imaging.

- Dynamic data basing using SWOT to provide comparisons to competing countries is required.
- Process re-engineering is another major step to reduce cost and upgrade quality. The quality cost concept can percolate through the industry and increase the chances of success.
- Standardization of products is crucial to the handmade carpet industry in order to raise customer confidence in the value of such high-priced products.
- Capacity building for this rural industry can take the sector to a new height; however, for network improvement is critical since the industry is weak, and needs immediate attention, investment, quality upgrades and continued network development immediately.

The suggested steps (and others to be added in light of ongoing experience) must be considered as an Integrated Carpet Improvement Programme through a Technology Mission for Carpet Textiles. The suggested Programme/Mission might be supported by an international body (IMF/World Bank/Asian Development Bank/UNDP/UNICEF/UNESCO etc.) in the general socio-economic interest.

Socio-economics

Socio-economics is the study of the relationship between economic activity and social life. The field is multidisciplinary, using theories and methods from sociology, economics, history, psychology, and others. It is a relatively new social science that has emerged as a separate field of study in the late twentieth century. Most colleges and universities do not have a separate department or degree for socioeconomic studies.

Socioeconomics typically analyzes both the social impacts of economic activity and economic consequences of social activity. In most cases, however, socio-economists focuses on the social impact of economic change. Such change might include a factory

closing, market manipulation, the signing of international trade treaties, new natural gas regulation, etc. Such social effects can be wide-ranging in size, anywhere from local effects on a small community to changes to an entire society.

The goal of socioeconomic study is generally to bring about socioeconomic development, usually in terms of improvements in metrics such as GDP, life expectancy, literacy, levels of employment, etc.

Role of Social Responsibility in Carpet Trade

In the early 1990s, intensive campaigns against the use of child labour led to a proposal to totally boycott the import of carpets from India. A boycott would have led to a disaster, with many families losing their earnings and would have further worsened the already severe problem of poverty. To avoid such negative consequences for workers, exporters and the whole carpet manufacturing regions, constructive solutions were needed. Consequently, RUGMARK, the initiative against the use of illegal child labour in the carpet industry, was begun in 1994 by Indian carpet manufacturers and exporters along with UNICEF and leading non-governmental organizations (NGOs) under the guidance of IGEP.

The problem of child labour is linked with various socio-economic conditions. Poverty is considered its main cause, which leads to illiteracy, low productivity, poor health and low life expectancy. The problem of child labour is thus a vicious circle. To help resolve it, RUGMARK is trying its best to break this circle by helping poor children. It is spreading awareness among the people in the carpet belt about the abuse of child labour and trying to improve the basis for structural changes.

With the experience of RUGMARK, IGEP is now working for the introduction of social standards on voluntary basis in the Indian industry. The strategy is based on improvement, support and co-operation. The goal is to improve the basic social and environmental conditions rather than stopping business relations on account of unsatisfactory conditions at work sites. Meanwhile, progress in the leather and textiles sectors is being made with the support of several Indian associations. This has encouraged IGEP to start ES Mark. “E” stands for ecological and “S” for social

responsibility. The ES mark will certify that the company meets ambitious social and environmental conditions in sectors like jewelry, handicrafts, sports goods and toys.

Potential for Growth

A review of the handmade carpet sector in reveals a potential for capacity building. In the Indian context, the role of women could be one major factor for industry expansion in socio-economic terms.

- Training has covered the entire country but is rurally based;
- Women have formed self-help groups and become entrepreneurs;
- Such organizations have been strengthened by the IICT's introduction of the concept of fair trade practices through the work of British international consultant, Dr. Martin Kunjz, of Fair Trade Solutions.
- The above-mentioned intervention through UNDP Project through IICT has been exemplary with respect to introduction of social accountability not only in letter but also in spirit.
- In the current year, IICT has been able to build up capacity for approximately 500 artisans of whom about 300 are women.
- The areas of capacity built-up have been carpet weaving, designing and entrepreneurship.
- Most of the trainees could improve their Quality of Work Life.
- The greatest potential for future artisans can be found among women and marginal workers.

Extension of Capacity Building

The sector needs formal capacity building to boost trainee morale and increase markets for their products. To this end, IICT could make available a Modular Employable Skills (MES) development programme in association with Director General of Employment & Training of India's Ministry of Labour and Employment.

The MES Development Programme

Background

The need for emphasis on the skill development, especially for the less educated, poor and out of school youth has been highlighted in various forums. The skill level and educational attainment of the work force determines the productivity, income levels and adaptability of the working class in a changing environment. A large percentage of population in India is living below the poverty line. One of the important causes is lower percentage of skilled persons in the workforce.

Skill development at present is taking place mostly in an informal way with people acquiring skills at the workplace when they help their parents, relatives and employers. Such individuals do not have a formal certificate and thus earn lower wages and are exploited by employers. They have come through informal system due to their families' socioeconomic circumstances and the necessity of earning a livelihood rather than attending a formal education and training programme. While their productivity is low, their contribution to the national GDP cannot be ignored. If the country can create a system of certification which not only recognizes their existing skills, but also provides further education and training, it will not only permit the workers to earn a decent living, but also contribute to the national economy by higher workforce productivity.

Another related problem to be tackled is large number of student drop-outs (about 63% of the student body).

The Framework for MES Skill Development

Very few opportunities for skill development are available for school-age youth and existing workers. Most of the existing skill development programmes are long-term in nature. This was essential considering their educational, social and economical background. Poorly and less educated individuals cannot afford long-term training programmes due to opportunity costs, and often cannot meet high entry qualifications. Therefore, a new framework for skill development in the informal sector including carpet and textile manufacturing has been created by IICT to address the above mentioned problems. The key features of the new frame work for skill development are:

- Y Demand-driven short-term training courses based on modular employable skills
decided in consultation with industry;
- Y Flexible delivery mechanisms (part-time, weekends, full-time);
- Y Different levels of programmes (foundation level as well as skill upgrades) to meet the demands of various target groups;
- Y Training to be provided by vocational training providers such as IICT or IICT-approved institutions;
- Y Optimum utilization of existing infrastructure to make training cost effective;
- Y Testing of skills of trainees by independent assessors who would not be involved
in the conduct of the training programme;
- Y Testing and certification of prior learning skills;
- Y The essence of the scheme is in a certification regimen that will be nationally recognized
by both the government agencies and industry/trade organizations.

The Short Term courses would be based on MES model.

The Concept of MES

- Y Identifies a “minimum skills set,” which is sufficient to gain employment in the industry;
- Y Allows skills upgradation, multi-skilling, multi-entry and exit, vertical mobility and flexible life-long learning opportunities;
- Y Allows recognition of prior learning (effective certification of informally acquired skills);
- Y Permits the modules in a sector, when grouped together, to lead to a qualification equivalent to National Trade Certificate or higher.
- Y Could make available from level 1 to level 3 in different vocations depending upon the needs of the employer organizations.
- Y Would benefit different target groups such as:

- . / Workers seeking certification of their skills acquired informally;
- . / Workers seeking skills upgrades;
- . / Early school drop-outs and the unemployed.

Curriculum Development Process

The following procedure should be used for developing course curricula:

- Y Identification of employable skills sets in a sector based on division of work in the labour market;
- Y Development of training modules corresponding to identified skills sets, so as to provide training for specific purposes;
- Y Organization of modules into a course matrix indicating vertical and horizontal mobility (the course matrix should depict pictorially the relation among various modules, prerequisites for higher level modules and the path to progress from one level to another);
- Y Development of detailed curricula and vetting by a trade committee and by the NCVT (close involvement of employers organizations, state governments, industry experts, vocational training providers and other stakeholders must be ensured at each stage).

Programme Duration

Time taken to gain the qualification will vary according to the pathway, and will be kept very flexible for persons with different backgrounds and experience. Normal duration statements may appear in training programmes, which may be based on the content and requirements of a MES module.

Pathways to the Acquisition of Qualification:

Access to the qualification could be through:

- an approved training programme; or

- a combination of an approved training programme plus recognition of prior learning including credit transfer; or
- The recognition of prior learning that provides evidence of the achievement of the competencies for the qualification.

Expected Impact of MES Development Programmes

Implementation of MES development programmes across 2-3 million artisans engaged in the carpet trade would have enormous socio-economic impacts. The goals of socio-economic: improvement in the GDP, life expectancy, literacy, and level of employment could all be achieved through this intervention. Organizations like the ILO, WTO and United Nations through its various programmes can help make a beginning of such a project.

Plan for Accelerated Growth of the Carpet Sector

India is famous for handmade carpet manufactured and exported from major belts as mentioned under:

- Uttar Pradesh (Bhadohi, Mirzapur, Varanasi, Agra)
- Rajasthan (Jodhpur, Bikaner)
- J & K (Jammu, Srinagar)
- Haryana (Panipat)
- Gujarat (Valsad)

These belts need to be geared up for enhancement in the world market share of carpets in general and hand knotted carpets in particular. Improvement in the socio-economics status of the trade in general and artisans community in particular would result.

To accomplish this, Public-Private-Partnership (P-P-P) and/or national government interventions are required. It is therefore pertinent to describe the prevailing manufacturing process, to identify specific areas that need attention and to provide a gap analysis to enable preparation of an action plan that can be implemented and monitored.

Manufacturing Process

The manufacturing process includes key areas including:

- I. raw materials in fiber and or yarn form, dyes, chemicals, auxiliaries and ancillary materials;
- II. knotting or weaving or tufting;
- III. dyeing of yarn (wool, silk, etc.) in shades meeting design/naksha.
- IV. washing of carpets followed by drying;
- V. finishing including trimming, stretching, embossing, fringe knotting, etc.

Specific Areas Needing Attention

Overall quality upgrading demands action in the following areas to be implemented by means of public-private-partnerships and/or Government of India (GOI) intervention through the 11th Five-Year Plan for the growth of India's carpet industry.

<u>Specific Areas</u>	<u>Mode of Intervention</u>
1. Raw Material	P-P-P
2. Common Facility Centre	P-P-P
3. Human Resource Development	GOI
4. Market Intelligence	P-P-P
5. Information Technology	P-P-P
6. Quality Culture	P-P-P
7. Infra Structure	GOI

Gap Analysis and Action Plan

The prevailing shortcomings vis-à-vis the suggested strategy to meet growth targets are identified to support our views about technological and institutional requirements for the handicrafts sector and its wool/carpet/textile sub-sectors. This vision statement indicates specific areas which need governmental interventions.

Conclusion

Suggested Views-cum-Action Plan for Upgrading the Indian Carpet Industry

Suggestion Number	Specific Area	Prevailing Shortcomings	Views/Suggested Strategies to Overcome Shortcomings through Governmental Intervention
1.	Raw Material	<ul style="list-style-type: none"> • Non-availability of right quality at right time at right cost. • Inadequate knowledge of raw materials and product-client relationships. • Reduction in share of hand knotted and other value-added carpets. 	<ul style="list-style-type: none"> • Creation of physical raw material bank covering key raw materials for major carpet belts. • Creation of knowledge bank/raw material service center. • Capacity building to manufacture and market high value-added carpets and similar items.
2.	Common	<ul style="list-style-type: none"> • Absence of culture 	<ul style="list-style-type: none"> • To equip with developed

	Facility Centre	for technological upgrades.	<p>version of looms, tools & equipment to be funded by Ministry of Textiles, O/o DC (Handicrafts).</p> <p>/ Commercialization of new backing technique for tufted carpet for which patent has been filed by IICT.</p> <p>/ Adoption of IICT-developed cross bar horizontal loom, now validated and being patented.</p> <p>/ Adoption of new pile formation technology under development and being patented.</p> <p>/ Adoption of modern dyeing equipment for cost-effective and diversified dyed yarn.</p> <p>/ Adoption of modern carpet washing, drying and finishing system.</p> <p>/ Adoption of modern spinning system for inducing engineered carpet yarn.</p> <p>/ Creation of intellectual knowledge bank (IKB) wherein all relevant and related international journals /magazines for the fields of rural management, information technology, catalogues, colour and design forecasting etc., so that stakeholders can become members of IKB.</p> <p>/ Creation of National Design Bank (NDB) wherein all individual designers can become members; and the NDB, as a separate entity, would also have different national international buyers in its membership, leading to the creation of a niche market for Indian wool, carpet and textile products.</p> <p>/ Technical service and support to industry. IICT already has this portfolio, which can be further strengthened by permitting the creation of a pool</p>
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			of consultants from various fields covering all regions of the country and abroad. This will help the sector to identify the challenges for the sector & deriving solution for the same.
3.	Human Resource Development	Lack of qualified and trained workers and opportunities for workers to improve skills.	<p>./ To encourage the industry to update the existing labour force and recruit trained and qualified workers by introducing both short-term and long-term projects to be funded by relevant organization.</p> <p>./ To cover the entire workforce of the sector through short-term training, MES development programmes, distance learning programmes and customized industry-driven skill development programmes. IICT is providing limited service in this area, which can be strengthened further.</p> <p>./ To cover the entire sector's labour force through knowledge integration programmes undertaken by local, regional, national and international level seminars and workshops.</p> <p>./ Total support to IICT to expand its activities with respect to creation of academic and research fields related to management, computer applications, etc., in general and the wool, carpet and textile sectors in particular.</p>
4.	Market Intelligence	Absence of relevant database for the sector nationally and internationally.	<p>Creation of a dynamic database.</p> <p>./ Information on raw material quality and prices paid by manufacturers at home country and abroad.</p> <p>./ Information on the importation of raw materials in terms of quality and price pertaining to importers and exporters.</p> <p>./ Information on export and import of final products covering</p>

			<p>the details of exporters and importers, product mix and price for the particular product mix. ./ Information on prevailing regional and national cost structures covering India & competing countries. ./ SWOT analysis of the trade as a whole in regional /national / international context.</p>
5.	Information Technology	Absence of networking.	<ul style="list-style-type: none"> • Creation of networking for the cluster as well as amongst the clusters of the region and country. ./ Accessibility to related information for faster decision making and to avoid delay in supply in delivery. ./ Adoption of software like Carpcost for research on cost and its control.
6.	Quality Culture	Absence of brand image as quality culture is not evident.	<p>Creation of brand image. ./ Assured quality through testing and inspection of raw material, process and final product. ./ Benchmarking of above. ./ Publicity and retention of strengths identified through above. ./ Removal of identified weaknesses and exploitation of identified opportunities and removal of anticipated threats by executing short-term and long-term research projects to be funded by relevant agencies. ./ Diversification of product range (silk carpets, higher knots value, added finishing, etc.). ./ Become a reliable manufacturer and supplier through: I. creation/adoption of brands (quality labels such as Okotex, GUT, etc.). II. Adoption of relevant quality systems (e.g., ISO 9000, ISO 14000, SA 8000)</p>

7.	Infra Structure	<ul style="list-style-type: none">• Absence of adequate and proper power supply, surface networking and transportation systems, and environment for quality life.	Industrial associations/council/relevant experts' opinions may be sought in this regard.
	Overall	<ul style="list-style-type: none">• UVR for Indian Wool/Carpet/Textile products is significantly lower than competing countries.	Cost-benefit analysis through an approach paper should be prepared by any professional as a consultant and or turnkey implementing agency through funding by relevant agency.

The potential for socio-economic growth for the handmade carpet sector can be tapped. To do so, the International Monetary Fund, Asian Development Bank, World Bank, United Nation forum or similar relevant agencies need to be brought into picture to implement above mentioned suggested views. The impact expected from implementing the suggestions presented here would be manifold: improved growth in GDP, life expectancy, literacy, level of employment, etc.

About the Authors

Dr. Sandeep Srivastava is a Ph.D. (Analytical Chemistry) from the Indian Institute of Technology, Delhi and M.Sc. (Inorganic Chemistry) from Hindu College, Delhi University, Delhi. Dr. Srivastava has been a civil servant since 1989 and is presently working as Additional Development Commissioner (Handicrafts) in the Office of the Development Commissioner (Handicrafts), an attached office with the Ministry of Textiles, a nodal office for the Handicrafts Sector at the national level. In his capacity as Additional Development Commissioner (Handicrafts), Dr. Srivastava is a Vice-chairman in the Indian Institute of Carpet Technology, Bhadohi (U.P.). During his posting as Additional Development Commissioner (Handicrafts), Ministry of Textiles he has visited the Philippines, New Zealand, Australia, China, Italy, USA, UK, and other countries as a

Team Leader representing the Government of India to deliberate with concerned overseas authorities/organizations for the purpose of ensuring higher export earnings for the country by way of enhancing acceptance for Indian Handicrafts in these high end markets. Apart from this, he is a keen researcher and has continued successfully to pursue research work in the field of polymer chemistry at the Indian Institute of Technology, Delhi, University of Delhi and Indian Institute of Technology, Roorkee. He has published research papers in various international and national journals. He was also nominated as a member of the working group on marketing for “National Bamboo Mission,” Ministry of Agriculture. Recently, Dr. Srivastava has participated in the 14th SAARC Summit in New Delhi and contributed to the formulation and institutionalization of a proposed SAARC Museum in Delhi.

Dr. K.K. Goswami is Ph.D (Technology), Calcutta University and Fellow of Institution of Engineers (India), C.Text, FTI of the Textile Institute, Manchester (UK). He is Professor, Director & Member Secretary of IICT with more than 30 years working experience in the field of industry, research, teaching and training. During this period, he has written more than 50 publications for various national and international journals and books on textiles and their allied industries. He was the Roster expert, International Trade Centre (UNCTAD/WTO), Geneva, Switzerland. He holds various key positions including Member of All India Handicrafts Board, Govt. of India; Convenor, Research Degree Committee and Member, Board of Studies; Paper setter, Examiner and Research Guide of Uttar Pradesh Technical University, Lucknow. He is credited to be the founder Director of the Indian Institute of Carpet Technology (IICT) under the Ministry of Textiles, Govt. of India and in making IICT truly functional in the interests of concerned stakeholders. He has worked as Principal Investigator for around 50 projects sponsored by various agencies. He is the inventor of a New Carpet Backing Technology (Snehabha) which has been considered a milestone in the history of handmade carpets and a Cost Calculation Software (CARPCOST) which has been successfully validated. He is expecting award of copyright & patent shortly. He is Editor as well as author of a chapter “Handmade Carpets” for a book entitled “Advances in Carpet Technology” by Woodhead Publishing, UK, to be completed shortly.

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The executive committee of IICT dated 19.03.2012 resolved that IICT should have a futuristic plan with a proposal for consideration of SFC/EFC as appropriate.

The issue was regularly discussed in subsequent meetings of Executive Committee. In the meantime, Shri Virendra Singh Hon'ble Member of Parliament, Bhadohi vide letter No. 00089/78BDH/MP dated 27.08.2014 recommended to government for expansion of IICT to Indian School of Textiles of University level so that IICT can play its desired role of capacity building. As a follow up MP himself met the then DC(HC) on 25.02.2015 and subsequently as desired a concept note was submitted by Director, IICT to the then DC(HC) on 03.03.2015.

The issue of VIP reference and submitted concept note were discussed in detail in the Executive Committee Meeting dated 19.05.2015. The committee members expressed concerned about its viability. Hence advised IICT to submit a proposal to survey the feasibility under R&D scheme of DC(HC) to be carried involving consultants preferably from Dept. of Management Studies, IIT Delhi and Textile Technology Dept. IIT Delhi.

In accordance IICT submitted a proposal dated 10.06.2015. In response to the proposal O/o DC(HC) extended the grant dated 04.09.2015 for conducting "Feasibility study on up-gradation of IICT, Bhadohi to a national level Textile Institute" of university level with definite TOR.

As desired by E.C, a road map for the project was also submitted on 14.09.2015 for perusal of Director (HC), Vice-Chairman, IICT wherein Methodology, Action Plan and Time schedule was framed and same was discussed in detail in the O/o Dr. D.K.Banwet, Emeritus Professor, Dept. of Management Studies, IIT Delhi dated 15.09.2015.

Further a background notes along with draft DPR and other documents were shared with the consultants to facilitate further proceeding at their level. Thereafter, on 13.10.2015 draft TOR was sent to all the experts which was executed in legal paper on 18.10.2015 with clear cut TOR.

The draft DPR was presented to the then DC(HC) on 23.11.2015 wherein one of the engaged experts attended and briefed to the chair. The outcome of the meeting in the form of salient points are;

- Employability of M. Tech (Carpet & Textile Management) be ensured.
- Elements like entrepreneurship fashion, information technology, accounting, finance, management including performance and project management to be integrated to the existing B. Tech Course.

IICT also shared the views expressed by ASFA during his visit to IICT onfor appropriate inclusion

Based on above background, consultants & field expert designed the template for survey and feedback. Draft DPR from IICT was also shared to facilitate integration with the feasibility report .

The outcome in the form of integration and compilation of the work done by the experts, field experts including input from IICT were discussed on 25.03.2016. The same was further discussed in presence of project leader, consultant, field expert, IICT Project Team on 29.03.2016.

The final report was prepared with consensus of all concerned on 30.03.2016. The salient features of the report are:

- Professors from IIT Delhi for the conceptual direction, time to time review, examination of documents, personal interaction and analysis of data were involved. The field experts from SMS, Varanasi and IICT Bhadohi including Director IICT as leader were also inducted to support consultants as per provision available. The activities were in compliance to TOR of government and emergent needs.
- Examination of DPR in terms of statutory requirements of Ministry for SFC/EFC compliance was ensured
- The examination of the revised cost estimate integrating identified additional elements, which worked to ~ 54 Cr (Non-recurring) and Rs. 15 Cr (recurring). DKT to give actual modified figure on 25.03.16
- The consultants also examined the target of revenue generation of 9.19 Cr, where recurring expenditure other than pay and allowance is 6.70 Cr. DKT to give actual modified figure on 25.03.16

- The up gradation of IICT integrating all desired elements in existing B. Tech Course including introducing M. Tech (Carpet & Textile Management) were found to be feasible and timely in view of required capacity building for the sector with due compliance to feedback. A draft curriculum for M. Tech in Carpet & Textile Management a unique course of its kind combining two engines: Technology and Management seems to be extremely potential for this sector. Thus capacity building including entrepreneurship targeted in the proposal is likely to promote Skill India and Make in India mandate of government of India to meet the need of rural folk and derive demographic dividend in higher end. Further it was felt that institute to focus on MES in all probable and potential modules of textiles in general and carpet and home textiles/ hand crafted in particular. There may be necessity to redesign the curriculum to make it unique type so that true terminal competency is achieved. More and more entrepreneurs are created who can have better livelihood instead of working as an artisan under a contractor with a paltry wage so that demography at BPL and APL type also derives benefit. The socio economic potential as already identified earlier can be exploited by the country.
- The investment for this up gradation over a period of 5 years or so is feasible since the same is at par with similar national level institutes where Rs. 5.00 lakhs/ annum/students is being spent on the recurring head. As for as IICT is concerned, the same expenditure is Rs. 5.01 lakhs/annum/students. The consultants are of the opinion that IICT will be able to self-sustainable w.r.t. recurring expenditure other than pay and allowances after this Phase III expansion considering IICT became functional in 2001, 20 years' time is required to reach this height and quite reasonable.
- The report emerges with the recommendation for the up gradation as per above. However, it was pointed out that proposed up gradation integrating so many elements and introducing one PG.Course to run successfully for five years under the this expansion plan without ignoring skill development and up gradation to create work force. Thereafter in the next phase the creation of University will be easier depending on the demonstrable success and need at that point of time. The IICT can strive to become a lead institute of the world as University to serve the world handmade carpet industry in particular and rest textiles in general to fulfil the desire of Shri Atal Bihari Vajpayee the then Prime Minister of India expressed during inauguration of 1stWorld conference on hand made carpets in November, 2003. The relevant quote is *“Towards this end, in India we have made a small beginning by setting up the*

Indian Institute of Textiles and Carpet Technology recently in Bhadohi in Uttar Pradesh, which is famous for its carpet industry. New Zealand has come forward to join us in this endeavour by introducing a distance learning programme for skill upgradation. We shall be happy to offer this platform to any country and to the industry on a mutually agreed upon framework of cooperation”

- The consultants are committed to be available for power point presentation in front of competent authority of O/o DC(HC)/Ministry of Textiles, Govt. Of India to clarify any question arises.
- In this exercise support of Director, IICT who led from front and behind both was taken besides from faculty/staffs/students of not only IICT but also from other national and international students /faculty/staffs as responded. Other respondents include employers and whosoever wanted to respond.

The certificate issued by consultants as statutory requirement signifies all above points as a testimony for the feasibility / viability of the proposed up gradation to create the base for conversion of IICT to a true relevant and referral University of its kind. The report is enclosed with all supporting documents including for financial implication.