Building Competitiveness: A Case of Handicrafts Manufacturing Cluster Units

S. Venkataramanaiah, N. Ganesh Kumar

Abstract

Handicrafts manufacturing is a low technology fragmented and predominantly labour intensive one. This art was learned and transferred from one generation to the next. This sector has undergone significant changes due to the ever increasing global competition, technological advancements and economic developments. This paper presents various drivers that are affecting competitiveness of handicrafts manufacturing units of a cluster through empirical study. Various challenges faced by the cluster units were identified through field visits, interaction with stakeholders and detailed analysis. Based on the study a suitable framework and recommendations for improving competitiveness of the cluster units is proposed and policy implications were identified.

Key words: Clusters, Competitiveness, Handicrafts, Productivity.

1. Introduction

Recent empirical studies (ASK, 2007, Basu et al., 2009, Mutua et al., 2004, Tiwari, 2002) show that firms in clusters, in developed and developing countries, become competitive and contribute significantly to the economic growth of the country. Clusters are emerging as the engines of economic activity, capable of improving standard of living for the region. With economic growth, the clusters/units undergo significant changes in its form, products, interventions, market channels and overall performance (Porter, 1990). Further, it is to be noted that the cluster development primarily depends on social environment, network of organisations, innovation of entrepreneurs and interventions. While implementing recommendations one needs to focus on policy implications for the local, State and Central government agencies. Effective implementation of various interventions requires development of suitable project structure consisting of timeframe, leadership, pilot run, research team, policy issues, funding sources etc. Clusters provide a framework for formulating and implementing effective public policies and making public investments to foster economic development (Porter, 1990). Policies need to have an impact on productivity, innovation and need to change the environment for many companies in the cluster not just a few.

From empirical studies it is noted that the cluster development is better when the responsibility is given to the cluster members with a focus on regional development (USAID, 2006). Handicrafts business worldwide has undergone significant changes in both its manufacturing, distribution processes, marketing and funding mechanisms. In addition, handicrafts are also not exempted from global competition, technological advancements in the manufacturing process and economic developments. In case of developing countries, handicrafts are contributing through increased exports as well as meeting increased domestic demand. Governments at both central and state level are supporting the handicrafts units through suitable interventions like cluster development programmes (CDPs). As a part of this, suitable productivity improvement approaches in different areas like product and process design, planning, manufacturing, marketing and distribution were developed and implemented that help to sustain in the competitive environment. Technological developments, mechanization in manufacturing, innovative financial services and allied areas have helped in improving the productivity and quality of products and services offered in almost every sector. Several studies (Zhang et al., 2004; McDonald et al., 2006; Basu et al., 2009; Lin Grace and Sun 2010; Venkataramanaiah and Parashar, 2007; The Hindu, 2010

and Business line, 2010) have highlighted the importance of cluster approach in building competitiveness among organisations of different sizes and located in industrial clusters. In few cases, factors that account existence of clusters are also addressed. According to Porter (1990), the competitive advantage of industrial cluster is influenced by four determinants viz., factor conditions, demand, supporting industries and firm strategy.

This paper is based on a comprehensive field study conducted by the authors with the objective to improve the competitiveness of the cluster units. This paper identifies various problems faced by the cluster units through field visits and interaction with stakeholders. From the field visits and interaction with the stakeholders, it is noted that the unit holders' problems are primarily due to low degree of adoptation of appropriate methods and technology and lack of integration with processes such as manufacturing, marketing and distribution. We propose suitable framework and make recommendations that might help in building competitiveness of the cluster units.

The paper is organised in seven sections. In the following section, demographics of the cluster units and institutional support are given. Section three describes the problem and objective of the study followed by challenges faced by the units in section four. Methodology and analysis is given in section five, recommendations are given in section six and finally conclusions are given in section seven.

2. Demographics of the Cluster and Institutional Support

A cluster is defined as a geographic concentration of units producing near similar products and facing common opportunities and threats. Artisans cluster is defined as geographically concentrated household units producing products such as handicrafts, handloom, leather etc. Typically these artisans belong to a traditional community producing long-established products for generations (Sarkar and Banerjee, 2007). Moradabad is famous for its handicrafts and is supported under cluster development scheme. Moradabad city is the head quarters of Moradabad district (see figure 1). Moradabad is located at a distance of about 170 km (100 miles) from Southeast of Delhi on the banks of Ramganga, a tributary of Ganges. Moradabad city was founded in 1625 and named after Murad, son of Mughal emperor Shahjahan. Moradabad is famous for production and supply of metal artifacts since eighteenth century. Moradabad is well known for metalware, particularly brass work and had made a mark in the world for handicrafts. The brassware is exported to countries such as USA, Britain, Canada, Germany and to the Middle East, Asia and many other countries in the world. Moradabad is popularly known as "Peetal Nagri" or "Brass City". The brassware industry in Moradabad bloomed in early 19th century and British took the art to foreign markets. Artisans from Benaras, Lucknow, Agra and many other places came to Moradabad. Local people learnt from the immigrating craftsmen and passed on the skills from one generation to another. A vast majority of the population of Moradabad city is dependent on handicrafts and most of the Artisans are not educated and they dependent on handicrafts industry as source of employment and livelihood. It manufactures wide variety of handicrafts for both domestic and overseas customers (Wikipedia, 2012). (Figure 1)

As per 2011 census, Moradabad stands at 26th rank in the country out of 640 districts with a total population of 47,73,138. Moradabad district has a population density of 1,284 inhabitants per square kilometer. Its population growth rate during 2001-2011 was 25.25% and has gender ratio of 903 female for every 1000 male. The literacy rate is 58.67% which is less than the national average of 74.04%. Minority population is about 46% of the total population of the district. Moradabad is a category "A" district i.e. having socio-economic and basic amenities parameters below the national average (Census of India, 2011).

In 1980's various other metalware like iron, steel, glass, wood, aluminum etc. were also introduced to the art industry of Moradabad. According to ASK (2007) study, there are about 14,500 household units dedicated for brass handicrafts, 11,500 for Aluminium and about 500 units to steel crafts. There are about 46,000 workers working across household units which generates about Rs. 34 crore annual income. Of late, the units are facing severe competition from both domestic and overseas

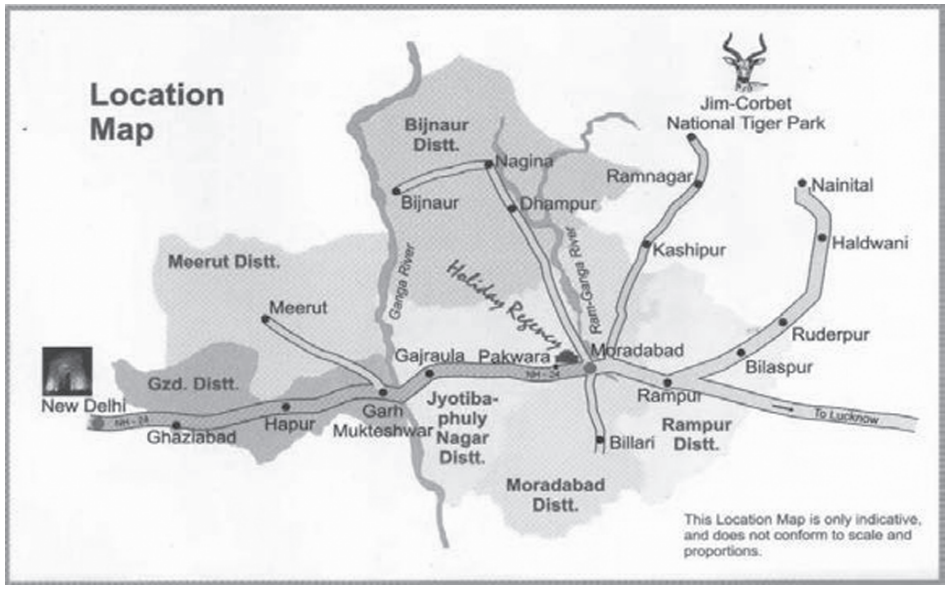

Figure 1: Moradabad Location Map

players apart from rising prices of raw materials. New technologies like electroplating, lacquering, powder coating etc. have also given further boost to this industry. Old and traditional units need to adopt new technologies, enhance skills, improve the working conditions and productivity and use ICT for marketing both within the country and outside.

Table 1: Composition of Moradabad Cluster Units

Type of Unit	Number of Units			
	Brass	Aluminium	Steel	Total
Casting	10000	7000		17000
Polishing	1000	1500	500	3000
Scrapping	1000	500		1500
Welding	500	500		1000
Grinding	500	500		1000
Coloring	500	500		1000
Engraving	1000	1000		2000
Total	14500	11500	500	26500

Source: ASK, (2007)

As per the discussion of the authors with district authorities, there are 6431 registered units and about 25,000 unregistered units in Moradabad engaged in production of brass, aluminium, steel, glass and wooden artifacts. There are about 250 export units of different sizes. Approximately four lakh Artisans are working in the cluster units. The number of household units undertaking different activities is given in Table 1. Exports of handicrafts during 1999 and 2011 are shown in figure 2 (Export promotion council for handicrafts). From the details (given in figure 2) it may be noted that there is a recovery of exports from the year 2008 onwards. This is primarily due to adoptation of productivity improvement approaches, global economic recovery, and support extended by the government agencies through suitable interventions such as mega cluster development programme etc. (Figure 2)

From the details of the empirical study and interaction with unit holders, upgrading of existing processes/ practices is very essential to build competitiveness of the units. The major stakeholders of Moradabad cluster is shown in figure 3. Government is spending significant amount of financial and non-financial resources in developing and maintaining necessary infrastructure at cluster level. Government agencies such as handicrafts department, directorate of foreign trade, export promotion council for handicrafts, department of industries etc. are facilitating in availing loans from banks and other financial institutions at affordable rates to registered unit holders. Government agencies are

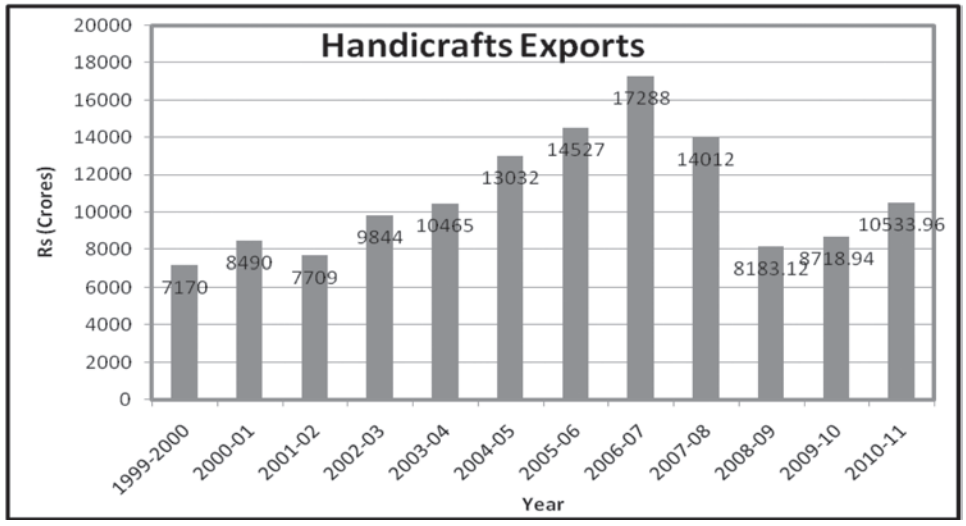

Figure 2: Handicrafts Exports: An Overview

spending significant amount of resources to generate power supply, provide good road network, exclusive industrial area for export oriented units and creating good opportunities for young entrepreneurs. Recently, department of handicrafts launched Comprehensive Handicrafts Cluster Development Scheme (CHCDS) by integrating other schemes as well. Facilities like CAD centers, communication networks, resource centers, raw material bank, design bank, marketing infrastructure etc. are being developed under public private partnership (PPP) model. During our field survey, the unit holders who have adopted productivity improvement approaches and institutional support reported various benefits. These include the following:

- Most of the unit holders reported improvement in revenue due to increase in productivity.
- 50% improvement in labour productivity and 30% improvement in production yield due to process redesign. (Figure 3)
- 20% reduction in labour cost due to continuous work and more than one and half times increase in number of working days during normal demand period.
- 25% savings in power bill paid by the unit holders due to automation of some of the old and inefficient processes.
- Around 40% improvement in non-value added (NVA) activities.
- 2-3 times increase in floorspace utilization, significant improvement in operational efficiency, better utilization of raw material and finished products.
- Improvement in working environment due to re-organisation of manufacturing and supporting resources.
- In few cases, more than 80% improvement in production volume was reported due to process redesign by addressing bottlenecks in the process.
- About 45% reduction in production run-time due to reduction in cycle time which is mainly due to addressing the bottlenecks in the process.
- 30-40% improvement in material flow/handling and inventory turns.
- Improved access to financial, technical, market, health and education related services.
- Few unit holders were also able to take up high end products from both domestic and overseas customers.
- Reported better prices for the products due to better quality and on-time delivery.
- Improved transparency across value chain due to adoption of ICT tools.

Apart from the above benefits, there are few important social benefits like reduction in migration of Artisans from high skilled work to low skilled work. It is also observed that due to proactive support from government

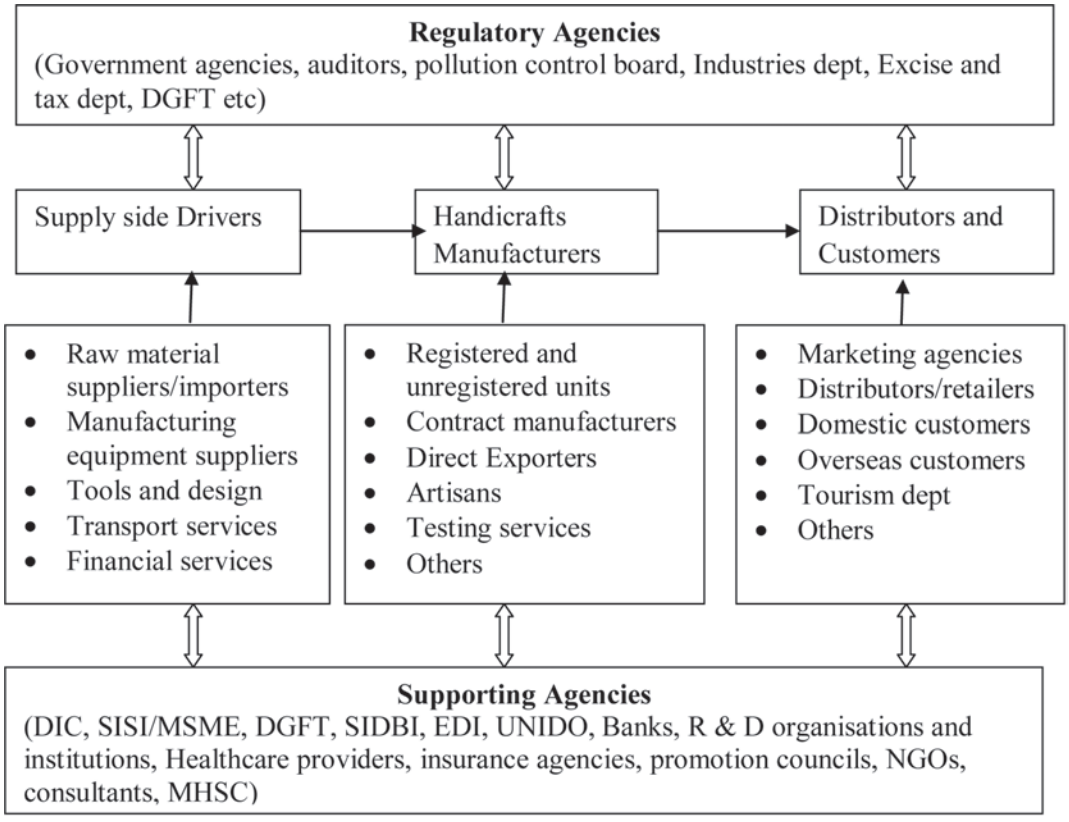

Figure 3: Stakeholders of Moradabad Cluster

agencies, a good number of youngsters are taking up handicrafts manufacturing and export. Some of the important areas where new entrepreneurs are focusing include supply of raw materials, high value added products and services, packaging, marketing, distribution, development of Artisans skills, business development services etc.

3. Problem Description and Objectives of the study

The proposed study primarily based on a planned intervention by Commissioner of Handicrafts, Ministry of Textiles, Government of India for improving the competitiveness of handicrafts manufacturing units of Moradabad cluster. The study is aimed at identifying the bottlenecks in the handicrafts manufacturing and distribution process and improving the productivity and competitiveness of the cluster units. The study includes, identification of non-value added activities (NVA) in the handicrafts manufacturing, distribution and allied areas. The study has been carried out in three phases viz., preliminary study for identification of units and products for detailed study. Phase two included detailed study using process flow analysis and time study analysis of the selected products and production processes. In phase three, recommendations were made based on the analysis. The study also covered analysis of macroeconomic environment, technology, processes followed, evaluation of craft category, product mix and assessment of present production processes.

The primary objective of the study is to provide recommendations based on detailed analysis that helps in building the competitiveness of the cluster. The study is aimed at improving the productivity of the production process by reducing wasteful /non-value added activities in the manufacturing process and disseminating the results across the cluster. The study also aimed at identifying the bottlenecks in manufacturing, distribution and other supporting areas and suggesting remedies that helps in enhancing the competitiveness of the cluster units.

4. Challenges Faced by Cluster Units

Handicrafts manufacturing is a low technology, fragmented and predominantly labour intensive industry. The unit holders faced several challenges including high production cost, low productivity of scarce manufacturing resources, inefficient layout of resources, uncertainty in supply of raw materials, exchange rate fluctuations, fluctuation of raw material prices, high transaction cost in procurement of input resources as well as marketing of final product, poor logistics infrastructure etc. From the field study and interaction with the unit holders, it was found that as high as 20% of the products were rejected at the end customer level due to quality problems (damages). General acceptance of final product at customer end is around 90%. In addition to the above, manufacturers also faced challenges due to limited availability of skilled manpower, inadequate institutional support for critical areas like funding, infrastructure, IT support etc. In addition, the units faced difficulties in printing, packaging and distribution facilities, integration of market information and connectivity to both domestic and overseas markets, quality and timely availability of raw material, lack of appropriate equipment for quality control, limited power supply, limited awareness among unit holders about market linkages and technological trends in handicrafts business. The challenges faced by the unit holders were categorized into five major areas viz.,

(i) Manufacturing and technology

(ii) Operations

(iii) Market access and logistics,

(iv) Financial and infrastructure and

(v) Social, educational and healthcare.

Specific challenges under each category were identified through interviews, field visits and detailed data analysis. These challenges were considered and suitable recommendations for manufacturing unit holders and policy makers were suggested (Venkataramanaiah and Ganesh Kumar, 2012a).

5. Methodology

The methodology included field visits, interaction with stakeholders including unit holders, Artisans, officials of government agencies, members of manufacturers association, financial institutions, healthcare providers, educational/ training institutions etc. Information regarding production processes, Artisans, and market related details was gathered from different sources including Metal Handicraft Service Center (MHSC), UNDP, ILO, DGFT and others. In this process, a semi-structured interview has also been followed.

The study has been carried out in three phases. In the first phase, a three member study team visited the cluster units to understand various problems and important concerns of unit holders, Artisans, government agencies and other stakeholders. Apart from these the team also undertook the study to identify non-value added (NVA) activities and their extent in the current production and allied processes. At the end of the first visit, the team selected about 15 units for detailed study. During second stage details pertaining to various products and processes have been collected. During second phase, the study team designed methods for improving the production capabilities of units. The team identified various constraints faced by the units and suggested some measures to address them at macro level. Proven productivity improvement methods/ approaches such as process flow analysis (PFA) and time study analysis were adopted in this study. These approaches were used to identify critical areas that affect the competitiveness of handicrafts manufacturing and distribution. In phase three, recommendations were made for improving the competitiveness of the units.

From the detailed study, it is noted that there is a huge potential for improving the productivity of the cluster units. In order to improve the productivity, the unit holders as well as support service providers need to focus mainly on streamlining the product design, process design, manufacturing, marketing, distribution, integration of vendors and customers across the value chain. Figure 4, shows typical relationship among these major functions. Based on process flow analysis and time study, bottlenecks in the system were identified

and standard times were determined for test cases. This would help in suitable pricing of products, cost control of various activities, offering incentives to workforce etc. Recommendations under each category based on analysis (Venkataramanaiah and Ganesh Kumar 2012a,

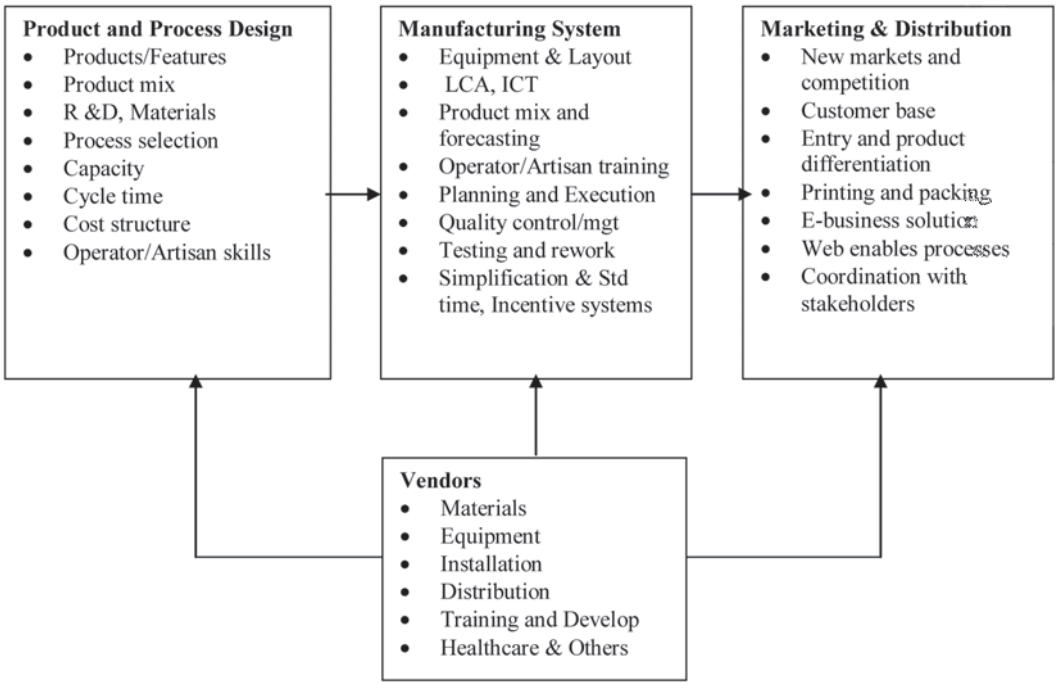

Figure 4: Major functions of cluster units and their relationship

2012b), are given in the following section.

6. Recommendations

The recommendations were categorised into four major areas viz., productivity improvement, financial resources, marketing, logistics and support services and MHSC services. The details are given below.

6.1 Recommendations for Productivity Improvement

Many unit holders are operating their units from homes, which were started more than twenty to thirty years ago. Some of them were started more than two generations ago, are still operating in the same old way and are not able to scale up to meet the demand volume. Units are operating at very low efficiency and create higher pollution levels. Many units evolved over a period of time by adding manufacturing equipment and other resources in an incremental way.

Based on the process flow analysis and time study analysis, bottlenecks in the processes were identified and remedies for improving the performance of the units are given. The estimated improvement by the proposed method over current method was calculated. The estimated improvement by the proposed method in manufacturing lead-time and system output is more than 45% and 83% respectively. Similarly, the operator output is increased by more than 52%. The significant improvement in the proposed method is due to increase in the capacity of bottleneck resource. However, the number of operators in the proposed method is increased by 20%. These observations are in agreement with the improvements reported by unit the holders those who have reorganized their units in the recent past. From these results, it can be concluded that the productivity and competitiveness of the system or units can be improved by balancing the capacity of sub-processes or operations.

It is proposed to establish a common facility center (CFC) at Metal Handicrafts Service Center (MHSC) for high capital-intensive manufacturing equipment such

as computerized quality control machine (Coordinate measuring machine, CMM) costing more (approximately Rs. 20 lakh) under a, appropriate Public- Private-Partnership (PPP) model. Unit holders can avail the services from CFC on payment basis. Financial resources required for these schemes including establishment of CFC can be availed from SIDBI, banks, SFCs. Handicrafts Department can provide one time grant of 50% of the cost of CFC. It is also proposed to meet the interest subsidy cost by handicrafts department.

6.2 Recommendations for Financial Resources

The extent of financial resources and their timely availability are very critical in building competitiveness of the cluster units. While designing and offering support schemes, guidelines based on Micro and Small and Medium Enterprises (MSME) Act can be used to classify the cluster units as micro, small and medium category. Limited financial support (one time loan) for upgrading the manufacturing resources is proposed. Such loans should be linked to productivity related investments. The financial support and other details of a sample proposal are given in table 2. From the sample results it is noted that the benefit of the schemes is very significant and many unit holders are highly motivated to improve the existing systems and procedures thereby the units can become more competitive.

6.3 Recommendations for Marketing, Logistics and Support Services

One of the most important challenges faced by many unit holders is limited or no direct access to domestic and overseas markets and cost competitiveness. This is mainly due to lack of awareness in developing and offering high end products in accordance with the changes in the market. Suitable market mechanisms need to be developed. Currently many small and medium unit holders are not able to connect to the mainstream market channels due to lack of suitable infrastructure at unit level as well as high cost involved. Such units are dependent on large and export units and traders for getting orders. Many SME unit holders are not able to get the due share in the final price of the product. Adding to this, there is limited or no access to logistics and other services like printing, packaging, quality certification etc. In order to avoid these problems, suggestions that help improving market access, logistics and other services were proposed. These include,

Table 2: Details of sample financial support

Unit type	Sales turnover (Rs. Lakhs)	Rate of Interest to offer (%)	Capital support* (Rs in Lakhs)	Max. No of units proposed (1st year)	Total capital required (Rs in Lakhs)	Interest subsidy cost# (Rs in Lakhs)
Small	Up to 50	0	10 or 50%	60	600	216
Units owned by Women	Up to 50	0	15 or 60%	10	150	54
Medium	50- 100	3	15 or 50%	20	300	81
Others	More than 100	5	20 or 50%	10	200	42
			Total	**100**	**1250**	**393**

*The capital support can be limited to the amount mentioned or 50% of approved project cost, whichever is lower.
Interest on total capital for 3 yrs at the rate of 12% per annum.

Marketing related

- Formation of consortium of handicrafts manufacturers, Artisans, R & D organisations and other stakeholders and network them with the professional organisations at national and international level which will help in improving sales and marketing.
- Develop appropriate and cost effective direct market channels. For example, networking with tourism and cultural departments at state and international level.
- Appropriate training and education on development of high end products would enhance the adoptability on large scale. Further, this would help in direct marketing of the products in domestic and international markets at better prices.
- Develop ICT resources and train the unit holders and Artisans to facilitate in developing high end products to wide range of customers using ICT.
- Develop of common website at MHSC for promotion of products and services of cluster units including MHSC.
- Reduce intermediation through education, training on use of ICT tools.
- Increase the support for participation in international and national level trade fares and exhibitions.
- Establish additional model showrooms for exhibiting the products of the cluster at different important locations in the country and networking with tourism department.
- Facilitate in offering products based on product differentiation strategy in place of cost strategy alone.
- Common IT infrastructure connecting unit holders and other stakeholders for cost effective and seamless integration with the reliable data on marketing and other aspects.
- Facilitate the unit holders and Artisans in developing innovative products and services.
- Establish Business development center/services using the expertise available within the cluster and outside and provide training on entrepreneurial and other skills.
- Build systems for buyer, seller and Artisans collaboration and development.

Logistics related

- Enhance the facilities in the warehouse/logistics center, so as to improve the responsiveness of the delivery process.
- Enhance logistics infrastructure and distribution services by forming consortium of unit holders, distribution and transport service providers.
- Establish state-of-the-art printing and packaging facility at local distribution or logistics center.
- Provide latest technologies that facilitate fast response for customs clearance etc. Use of RFID and related technologies would facilitate in improved response time to customers.
- Develop cost effective EDI and ICT tools at various stages including tracking of the order status etc.

Support Services related

- In order to improve the operational efficiency and competitiveness of the cluster units, an approach of Self Help Groups (SHGs) consisting of unit holders and Artisans is proposed. Under this mechanism, stakeholders can share their technical expertise and design skills of Artisans and scarce resources available within the cluster. This promotes cooperation among cluster units and lead to sustainable development.
- The resources at MHSC, needs to be reorganized suitably to implement recommendations under project mode.
- In order to support high value products, strengthening of MHSC with suitable skilled manpower and advanced resources is strongly recommended.
- Single window system for supply of raw materials and other resources using Artisan Credit Card (ACC) or UID is suggested to ensure the transparency in the implementation process.
- It is also suggested to link unit holders, MHSC, equipment and raw material suppliers with educational institutions and research organizations in the region to address specific issues like product design, testing, development of cost effective distribution systems and evaluation of benefits on regular basis.
- Continuous evaluation of performance of units, benchmarking within the cluster and other competitors are also suggested.

- Design and adoptation of suitable framework for institutionalization of the support on continuous basis is suggested.
- Suitable healthcare needs to be provided in collaboration with hospitals and insurance agencies through group insurance.
- In order to ensure health and hygiene, an effluent treatment plant is also suggested with the help of local Municipal Corporation.
- Continuing education for unit holders, enhancement of existing ITI and regular school with sufficient amount of resources for educating the children of the cluster members is also suggested.
- Upgrade vocational training center and provide required skills to large number of small unit holders and Artisans on regular basis.

6.4 Recommendations for improving MHSC Services

Dr. V K R V Rao, Economist, noted that "The Link between infrastructure and economic development is not a once and for all affair. It is a continuous process and progress in development has to be preceded, accompanied and followed by progress in infrastructure, if we are to fulfill our declared objectives of generating a self-accelerating process of economic development" (Sarkar and Banerjee, 2007).

The Metal Handicraft Service Center (MHSC), Moradabad was established by Government of India with financial and technical assistance of UNDP and Government of Utter Pradesh as well and functioning under the administrative control of development Commissioner (Handicrafts) Ministry of Textiles. The center is a national level institution for testing, metal finishing and allied processes of art wares and is providing necessary up gradation of skills and technique/services to the exporters situated in and around Moradabad, besides Training Artisans. The infrastructure of the center has grown reasonably but not adequate to the growing needs of the unit holders and changing dimensions of competition. In order to meet the needs of the small and medium unit holders recommendations were made to enhance the services of MHSC. These include,

- Upgradation of conventional manufacturing resources with latest and efficient resources which can help in meeting the quality and volume requirements
- Development of computer based design software and training of the unit holders and Artisans on technology frontiers.
- Development of cost effective printing and packaging services under common facility center.
- Development of common facility center with the state-of-the-art technology, printing and packaging services, business development and training services.
- Establishment of R & D resources like product design & development services, material testing, quality control, market research services, courses on crafts development etc and develop MHSC as a national level center of excellence for handicrafts.
- Development of quality management and quality certification services to unit holders.
- Recruitment and development of adequate and quality technical, managerial and support manpower under suitable scheme on contractual basis or consulting basis.

7. Conclusions

According to Porter (1990) and other experts, cluster approach provides a platform to address the specific barriers companies face in a given market environment apart from other general challenges that companies face. Clusters also provide a framework for formulating and implementing effective public policies and making public investments to foster economic development. Growth of firms in clusters slow down due to multiple factors such as market dynamics, technology obsolescence, scaling problems, migration of firms and workforce, lack of innovation, lack of financial resources, lack of suitable and timely interventions and other resources (USAID, 2006; Business line, 2010). Economists also noted that creation of one time infrastructure is not sufficient for sustainable economic development. Effective implementation of interventions requires suitable organisation structure and better understanding of problems faced by cluster units and implementation framework along with roles and responsibilities of stakeholders.

In this study various drivers that affect the productivity

and competitiveness of cluster units was identified and recommendations were suggested based on detailed analysis conducted using time study and process flow analysis. The results of the study show that significant gains in productivity are possible with minor modifications in the production process and this will help in improving the competitiveness of the cluster units.

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