

Science, Technology and Innovation and ‘Make in India’: Promoting manufacturing at district level

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Executed by Administrative Staff College of India (ASCI), Hyderabad

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Introduction

‘Make in India’ when seen in association with recent policy emphasis on regional development and promotion of ‘start-up’ initiatives, the imperatives of strengthening innovation support system (S&T infrastructure) become conspicuous. STI and Make in India: Promoting Manufacturing at District level is a programme initiated by DST to explore the prospect of adding depth and spread to the ‘make in India’ programme launched by the Government of India through carrying it to the district level. In the context of an economy of dual identity of ‘Bharat’ and ‘India’ there is an urgent need for generating employment and income at higher scale and pace to elevate ‘Bharat’ to the level of ‘India’, and eventually to elevate India as a strong economy.

The scope of the proposed study

What is being proposed is to take ‘make in India’ to the regions; to districts. It can usher in a new chapter in industrialisation of India. The basic infrastructure for such an endeavour is already in existence in the form of District Industries Centre (DIC) through the Industrial Policy Statement of 1977, and subsequent guidelines from government of India to state government for establishing DICs in the States. At present there are total 625 DICs distributed over 35 states and union territories. To add ‘make in India’ perspective to the present activities of the DICs would mean to explore new areas of activities. Identification of new products to be manufactured locally, the resources and skill set required and sourcing of the same. The study was conducted to understand the present status of DICs’ activities and organisational changes required for its proposed new roles.

Methodology

The mainstay of the proposal was holding workshops at state level with participation from DICs, Technical Institutions, and government agencies constituting innovation support system, along with a questionnaire based survey of DICs focusing on the present state of affair for understanding the nature of issues on the functions of DICs.

As part of the proposal, first one-day workshop was held at Gangtok in collaboration with Sikkim State S&T Council on 18 April 2016. Subsequently, similar workshop and survey were conducted at Guwahati on 9 June 2016 in collaboration with Indian Institute of Advanced Studies in Science and Technology (IIASST). Third workshop was held in Howrah district, West Bengal in collaboration with premier technical institution – Indian Institute of Engineering, Science and Technology (IEST), Shibpur on 22 February, 2017. Unlike Sikkim and Assam, DICs in this workshop were not very forthcoming and cooperative. On the contrary, clusters were very keen to share their views on the proposal of DICs in new avatar. It is on the request of one such cluster that a study on Bargachhia cluster has been undertaken to explore the innovation support system related problems faced by small and tiny units. The fourth Workshop was held at Dehradun, Uttarakhand on 3rd March 2017 in collaboration with Uttarakhand State S&T Council with active participation of the Commissioner of Industries and Director of industries, and 15 DICs. Responses to the questionnaire are yet to be received.

Findings from Sikkim study

Viewpoints of stakeholders participated in the workshop

An interactive discussion session was held in the workshop with all the participants. The representatives of two DICs of Sikkim shared the hurdles in efficient functioning. They, along with representatives of other government agencies and PSUs, had mentioned about various gaps (like communication, awareness etc.) that exist between them and the entrepreneurs. Representatives from entrepreneurial group also narrated various issues and challenges faced by them.

Various challenges faced by the entrepreneurs and govt agencies are listed below.

Various issues faced by Entrepreneurs	Issues for Institutions and Govt Agencies
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<p>Finance related</p> <ul style="list-style-type: none"> • Non-availability of timely and adequate credit • High cost of credit • High risk perception among Banks for lending to MSMEs • Non conducive Bank policies towards lending to start-ups • Collateral requirements • Limited access to equity capital 	<p>Finance Corporation</p> <ul style="list-style-type: none"> • Lack of good manufacturing venture – shift of focus of financing from manufacturing to service sector • Lack of technical manpower for project evaluation
<p>Operation related</p> <ul style="list-style-type: none"> • Ineffective marketing strategy • Lack of testing laboratories • Poor corporate governance and weak organization structure • Lack of packaging technology for export • Low awareness of Govt. schemes & programs • Weak ICT infrastructure 	<p>Technical / Academic Institutions</p> <ul style="list-style-type: none"> • Lack of assistance in product promotion & marketing • Limited knowledge on market feasibility, quality standard, business proposal writing • Lack of incubation cell • Lack of encouragement for entrepreneurship • Deficit of investors in manufacturing
<p>Legal & Tax related</p> <ul style="list-style-type: none"> • Poor implementation of legislation on IPRS • No mechanism for quick revival of various sick units & speedy shut down of unviable ones • Bureaucratic hurdles in setting new business • Complex labour laws 	<p>Research Organizations</p> <ul style="list-style-type: none"> • Constrains of scientific manpower • Unable to train farmers/entrepreneurs due to limited fund • Unavailability of required technologies to combat natural challenges such as unpredicted rain fall & less sunshine hours
<p>Infrastructure & Technology related</p> <ul style="list-style-type: none"> • Low level of technology adoption • Insufficient infrastructure - high raw material price due to transportation cost leading non-competitive price of finished product • Limited market access due to unavailability of real time data • Lack of access to modern technologies • Low levels of innovation • Lack of innovative delivery platform linked with market intelligence 	<p>Govt. Agencies</p> <ul style="list-style-type: none"> • Entrepreneurs have very limited knowledge of how to set-up an enterprise • Lack of professional course / training • Lack of fund for training of employees • Funds deficit for the performance of DICs

Major findings from responses from DICs

- a) Organizational structure: 1. Lack of senior officers (like credit, raw material, economic investigator and marketing managers) and technical manpower. 2. Inadequate training program for development of managerial skill and orientation of the DIC employees. 3. The infrastructure condition of DIC is very poor.
- b) Services: 1. Awareness program on product or process innovation, finance availability, sources of new technology or machine, raw material or alternative material are missing. 2. Training provided by DIC is predominantly in non-technical areas. 3. Missing is the support on technology generation, technology diffusion/marketing, machine and equipment supply, prototype development, testing, raw material, finance and refinance.
- c) DIC's responses to local needs: There is hardly any mechanism in place to assess the needs and to map the manpower status of local industries. Based on the issues and challenges narrated by the participants in the workshop, and major findings on current conditions and activities of 2 DICs in Sikkim reflected in the questionnaire, in the next section we intend to identify the kind of organizational restructuring can help DICs strengthening their roles.

Potentialities and prospects

As stated earlier, the state has good potentiality for value added products based on large cardamom, ginger, exportable flower, medicinal plant and herbs, and processed fruit. Pilot project can be initiated with a few items from this basket.

The Sikkim Industrial Promotion and Incentive (SIPI) Act, 2000 and its subsequent Amendments in 2003 and 2007 have already marked the priority areas for promotion of industries. The state follows the North East Industrial Investment Promotion Policy, 2007, which provides several incentives and concessions for investment in the state. Special emphasis has been given to specific sectors like IT, Pharma, Hydro power, tourism etc.

Findings from the Assam study

DICs in Assam

DICs role is to promote local industry. That the role has been inadequate is reflected in the fact that manufacturing sector contribution to the gross state domestic product has decline from 7.9 percent in 2007-08 to 7.5 percent 2014-15.

Viewpoints of stakeholders participated in the workshop

The views expressed are presented below.

Issues and challenge faced by entrepreneurs

Operation Related	
<ul style="list-style-type: none"> • lack of entrepreneurial quality • Lack of skilled manpower • Lack of product diversification and product distribution channel • Poor quality raw materials and lack of direct raw materials Supplier 	<ul style="list-style-type: none"> • Poor planning and marketing strategy • Lack of awareness regarding Govt. schemes and product innovation • Lack of collective purchase mechanism and marketing exposure • Lack of Common facility centre
Finance Related	Infrastructure & Technology Related
<ul style="list-style-type: none"> • Lack of credit linkage with Financial Institutions • High cost of borrowing • Mainstream banks are not lending aggressively to MSME sector as it is highly risky • Collateral requirement • Lack of capital 	<ul style="list-style-type: none"> • Poor supply of Electricity & high rate of electricity charges • Poor Quality of infrastructure like road and rail • Lack of modern technology and innovative technology • Lack of product-wise testing facilities

Issues and challenge faced by DICs and various government organizations

Representatives of 15 DICs attended the workshop. But only 7 DICs finally responded filling up the questionnaire after repeated follow-ups. In the following we present the findings of the questionnaire-based study.

1. It is to be noted that most of the DICs are burdened with large percentage of auxiliary staff. 2. Lack of technical staff is noticeable in DICs. 3. Only about 2% employees are graduate in technical disciplines. 4. No training programme for the staffs. 5. Poor infrastructure facilities. 6. No proactive role of DICs, only routine jobs undertaken.

Findings from the study of Bargachhia Cluster, Howrah, West Bengal

The third workshop cum brainstorming session in the series was held in Howrah, West Bengal in the premise of the Indian Institute of Engineering, Science and Technology (IEST) as host and knowledge partner. The one-day workshop was held on 22nd February 2017. Apart from substantial participations from their own engineering and S&T departments, IEST could mobilise participations from IIT, Kharagpur, and CSIR-CMERI, Durgapur. Unlike Assam, DICs' response and participation in the Workshop was inadequate. Representatives of only six DICs attended the Workshop. And while their participation in the discussion was rare, interaction has been at best cynical. However, IEST had also invited representatives from industrial cluster of Howrah, which, not very long back, used to be known as Sheffield of Asia and now experiencing decline fortune. Representatives of the clusters were active participants in the workshop and were forthcoming with the issues required to be addressed for reversal of their declining fortune.

Profile of Bargachhia Cluster and the study

The table below presents the profile of the Bargachhia cluster, the focus of the study.

Profile of Bargachhia cluster

No of firms (by type)	1025
No. of workers	4800
Turnover (Rs in Million's)	Rs. 642 Million
Associations in cluster	Bargachhia central lock factory
Major products	Nut, Bolts & Screw (Ferrous) Night lamp of low wattage, Nut, Bolts & Screw (Non- Ferrous) Screw (Non-Ferrous); Brush (Non-Ferrous) Pin (Non-Ferrous); Socket (Non-Ferrous) Washer (Ferrous); Washer (Non-Ferrous) Connector (Non-Ferrous); Encher & Flang (Ferrous) Holder (Non-Ferrous); Pad Lock; Furniture Lock Lock Accessories; Misc. Spares

Specific and relevant technical institutions (R&D, Testing Lab accredited)	National Small Industries Corporation Indian Institute of Foundry Bengal Engineering and Science University, Sibpur, Howrah Engineering Export Promotion Council District Industries Centre Regional Testing Centre, Baranagar, Kolkata Private Testing Centre
Major markets	Domestic
Major problems/prospects	Access to global market is negligible. Import of parts may start about which units are not sensitive. Poor quality consciousness. Lack of awareness about pollution abatement measures preferred by organized market. Traditional method of production. Low level of technological development Manufacturing defects and rejection rate are high. Problems with quality and productivity. Lack of testing raw materials and final products.
Data source and updated on	DSR Bargachia Metal Spare Parts, 2007

Major Findings

The present report is based on the study of enterprises engaged in manufacturing Machine spare parts, Hardware, Electric Wiring etc. About 45 enterprises have come together to form a company with a vision to create a Common Facility Centre (CFC) for access to better technology and cost advantage. According the leading members of the CFC majority of the enterprises are members of the company. They are trying hard to convince others, who are yet to join, the benefit of the CFC etc. The KnIDS team had closely interacted with the member enterprises for understanding the issues that are begging resolutions for quite sometime. Information has been collected through a structured questionnaire, and has been largely complemented by about 10 hours of recorded interviews with various stakeholders (cooperative and entrepreneurs) through several visits to the cluster.

Most interesting finding from the questionnaire-based survey is that there are hardly any notable operational differences among the enterprises, except personal details. Every enterprise can manufacture all the items others are manufacturing. Machinery etc. capital equipment are the same for all enterprises except minor variations in terms of prices and year of purchase (latest models may include a few new features). Basic mode of operation remains the same.

Important observations from the questionnaire-based survey

The sameness: About 50 odd enterprises make same products, they have similar level of skill, and educational background. The technology used is the same, and the same type of capital equipment is in use, and sourced locally from the same manufacturer. Mostly unskilled labourers are employed. It is the skill of the owner and the experience of the labourer that run the enterprises.

Competition: The units, therefore, operate in a highly competitive environment – if we go by the textbook definition of competition. In reality, the savagery of competition is managed by tacit understanding on ensuring downward rigidity of prices, and also by the ethics of non-predatory sourcing of orders.

Skill base of the enterprises: The units, who are the members of the company, are fully aware of the threats to their sustainability. They are aware that it is not the competition within, but from outside that is casting the shadow of despair for the future. They are aware that technology is changing fast, material used has changed; products and process of production have changed to become cheaper. The enterprises, however, have unflinching faith on their own skill, their design capability, their knowledge of the machine that they can easily tinker with to accommodate changes in design and specifications. They are confident that with appropriate support they can win over the present situation.

Innovation: On their part the owners of the units have adopted a unique organisational innovation to address the problem of technology and cost management. The operating units have come together to form a company with the aim to establish a Common Facility Centre (CFC). The idea of CFC is to make available high cost state of the art machinery available to enterprises. The CFC would be managed by the company for use by the members. Thus access to state of the

art technology would be assured with a control on cost of production. The company has already got the approval of the MSME deptt. Govt. of India, for funding of the CFC. For this purpose the land is also earmarked. But it is more than 10 years since approval that no progress has been made in this regard.

General observations and Recommendations

The units in the Bargachhia cluster are Innovative, confident of their skill to manage adversities, they have a strategy in place how to secure sustainability and future growth. They know so well their business and machine that they can confidently tinker with them to adapt to the requirements arising out of the changing situation. They know for sure what are their problems and what could be the possible solutions. The CFC is part of their long-term strategy for growth and diversification. They have a plan and programme in place once if the CFC becomes a reality. They rue about the fact that Howrah district is so well connected with rest of the state and the country, and there are about 5 internationally renowned technical institutions within the easy connectivity of the district, still they had never been benefitted by them. This not only proves but also indicate the gravity of situation – the disconnect between the education system and production system – that requires immediate attention for intervention.

DICs' role probably comes out more sharply. DICs were created to help industrialisation at district level. The enterprises in Bargachhia are disenchanted enough to call them useless and careless. At the same time they think they need an intermediate organisation that can work as a platform for all their technological and non-technological problems. The demand comes closer to what we were proposing in the workshops on STI and Make in India; that DICs should be revamped as District Innovation Centre and be run by technical institutions with the representation of all the stakeholders in the governing body.

Recommendations

Demand for CFC should be taken up immediately. The land related stalemate can be easily solved with the intervention of the appropriate ministry. They need technology mentoring. IEST and CMERI should be brought on board for one stop technological problem assessment and

solution. IEST being the closest to Bargachhia can have a separate wing to regular interactions with the enterprises in Bargachhia. They need training in market management. Is it possible for IIM, Calcutta to take up their case for better understanding of the types of management skill they need, and design a curriculum to address the same.

Revamp DICs to accelerate industrialization at district level

The questions that were raised and discussed in the sessions and also through the questionnaire were the following?

- Is the present state of functioning of DICs adequate for drawing STI inputs for enterprises?
- What is the present status of physical and human resource infrastructure of the DICs?
- What are the main activities undertaken by DICs given their organizational strength?
- How are they networked with the technical institutions around DICs?
- What are the organizational bottlenecks, if any?
- If at all, what should be the appropriate organizational changes for ensuring technological inputs to the enterprises?
- What would be the ways of creating Innovation ecosystem keeping DICs as the main actor? Who would be the other actors?

Briefs of the major findings from the DICs of the four states are as follows:

- Given the present state of infrastructure and manpower, most of the DICs provide services that have very little technological inputs to the enterprises.
- In many cases DICs do not have even their own office building and internet connectivity. Many DICs have vacant positions at senior levels, like managers of Credit, Raw Material, Marketing, Economic Investigation, etc. Absence of manpower with appropriate technical qualifications or with post graduate degrees is common with DICs.
- Most of the DICs are engaged in routine activities. As routine work DICs provide assistance towards provisional and permanent registration of small and micro units, issue essential clearance certificates for raw materials, water, electricity etc. They also organize motivational and awareness development programme. Assistance on technical and non-

technical support to entrepreneurs seems to be lacking primarily due to non availability of appropriate manpower with them.

- Most of the DICs do not have any notable interactions or collaborations with any technical institutions around them. The disconnect is appalling. This is also one of the important findings of the first National Innovation Survey.
- There is no scope of any pro-active activities. DICs are supposed to identify and cater to the needs of local enterprises. Most of the programmes conducted by DICs are very general in nature, as they are received from the above. Major organizational bottleneck is the lack of manpower, training of the staff and also motivation of the staff.
- DICs are required to be answerable to local stakeholders. Major organizational change is required for that. One way to achieve the same could be direct involvement of the technology institutions in the management and decision making process of the DICs.
- For promotion of S&T impetus and innovation in enterprises at district level, DICs have to be more proactive. They have to be more actively functionally connected with the technology institutions and STI support agencies. The mandate of the DICs should be identification of the potential areas, areas that require supports, nature of support required, and mobilization of institutional resources for local enterprises.

The above issues present an aggregative picture of the present state of affair in DICs. There are DICs with better profiles in certain aspects discussed above. But there could be no denial of the fact that in general DICs are facing tough time for legitimising their existence. The study put forward the view that DICs can be turn around to become the most important change agent at the district level. But that requires organisational restructuring that is doable only with a determined administrative drive.

If technology is the focus/the reference point, what would be the source of technology related knowledge, information, skill and training? One way of doing that is to make such institutions part of a governing body in which technology institutions would play the role for making and taking decisions on the activities of DICs - with the mandate of providing technological inputs and evaluation and mapping the auxiliary supports needed. This would also mean granting some sort of autonomy to DICs to be run by the governing body constituted of technology institutions

and other stake holders including people’s representatives, industry associations, government agencies and financial institutions.

The proposed restructuring is based on the concept of comprehensive and composite functioning of DICs, and visualized as depicted below. As depicted, DICs are seen as accessing technical and non-technical support from various agencies and institutions to provide mandated services to the enterprises. The restructuring is visualized for DICs as a proactive institution, as opposed to a department that is reactive and passive in its actions. In its new set up DICs would promote innovations at district level. DICs, therefore, can be rechristened as District Innovation Centers.

DICs as District Innovation Centre

