

Cluster Initiatives and Growth Poles: Correcting Coordination Failure

November 2006

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Submitted to :
Infrastructure Leasing & Financial Services Ltd.

Indicus Analytics

* I would like to thank RCM Reddy for introducing me to the topic; to ILFS for supporting this study; to Bibek Debroy for clarifying some of the related issues and introducing me to the pitfalls associated with government initiatives in growth poles. I am also grateful to Sumati Batia for painstakingly clarifying the various linkages and constraints faced in instituting a cluster initiative. All errors are of course mine. Comments would be highly appreciated: laveesh@indicus.net.

A. Introduction

Growth pole theory derives from the work of English economist William Petty (1623-1687) who was fascinated by the high growth observed in London during that period.¹ French economist François Perroux (1950) is generally credited with formalizing and elaborating on the concept.² It generally refers to the grouping of industries around a central core that are able to impact growth for them as well as that of the surrounding area. In its initial avatar, growth pole theory did not incorporate geographical concentration (in fact Perroux specifically denied the possibility of extending the growth pole concept to include geographical concentration).³ The geographical aspects of growth poles (or as sometimes called – growth centers) are now considered to be the most important facet of growth pole theory.

But despite the first formalization of the idea in 1949, there is as yet little consensus, at-least in India, on specifically what growth poles mean. This lack of consensus on its definition is a significant weakness of growth pole related policy. This (as we will discuss later) has contributed to significant confusion on growth poles and as a result the debate on regional and industrial development initiatives such as, PURA, clusters, and growth poles. Are they the same, complements, or are they substitutes?

As noted by Debroy (2006)⁴ ‘the intuitive notion of growth poles would identify a growth pole as an industry or perhaps a group of firms within an industry. At an extreme, a growth pole might be a single firm or it might be a group of industries.’ Can a manufacturing cluster be a growth pole? Perhaps yes. Can a city be a growth pole? Also yes. Can a collection of villages be made into a growth pole by providing urban amenities? Also yes, provided they do start growing. So could Special economic Zones (SEZs).

That is, the conventional usage of the term ‘growth pole’ is an *outcome*-based classification of geographically concentrated economic activity. If concentrated growth is achieved in a geographical area, that area can be considered to be a growth pole.⁵ In other words, the mere *intention* of generating high growth in a concentrated

¹ See Charles H. Hull, *Petty's Place in the History of Economic Theory*, Quarterly Journal of Economics, (1900). Hull refers to his work on *Another Essay in Political Arithmetick concerning the Growth of the City of London*. Written 1682, printed 1683, *Two Essays in Political Arithmetick concerning London and Paris*. 1687, *Observations upon the Cities of London and Rome*. 1687.

² Perroux, F. 1950. Economic space: theory and applications. Quarterly Journal of Economics 64: 89-104.

³ See Thayer Watkins, François Perroux's Concept of A Growth Pole, mimeo., Silicon Valley & Tornado Alley, USA. <http://www.applet-magic.com/poles.htm>

⁴ Growth Poles for Promoting Development of the Unorganized Sector – An Approach Paper, mimeo. Commission for the Unorganized Sector. Also see, David Darwent, "Growth poles and growth centers in regional planning--a review," Environment and Planning, vol. 1 (1969), pp. 5-32.

⁵ Growth poles themselves can have both positive and negative impacts on the surrounding areas and many have noted these possibilities. ‘The case of Paris shows that effect of polarization on the surrounding geographic area is not always positive. The attraction of Paris has been so great that it has been extremely difficult to promote any economic development in the area outside of the Paris region. French planning literature refers to this as the phenomenon of Paris and the French Desert.’ See Watkins referred to above.

geographical area is not sufficient to classify that area as a growth pole. The sufficiency condition is the *achievement* of high growth.

The current Indian policy objective is to create many micro-growth poles in the country with, ideally, (but not necessarily) positive economic impacts in the surrounding areas. This can be done in many ways and will be discussed later. But the critical point is, how do growth poles fit-in into the policy measures related to manufacturing or industrial clusters⁶ and rural infrastructure?

The approach paper of The National Commission for Enterprises in the Unorganized Sector (NCEUS) considers clusters to be an essential component of the emerging Indian economy. Clusters are 'defined as, critical masses – in one place – of unusual competitive success in particular fields. Clusters are geographic concentrations of interconnected companies and institutions in a particular field. Clusters encompass an array of linked industries and other entities important to competition. Clusters also often extend downstream to channels and customers and laterally to manufacturers of complementary products and to companies in industries related by skills, technologies or common inputs. Finally, many clusters include governmental and other institutions – such as universities, standards-setting agencies, think tanks, vocational training providers and trade associations – that provide specialized training, education, information, research and technical support.... Competition can coexist with cooperation, because they occur on different dimensions and among different players. Clusters represent a kind of new spatial organizational form, in between arm's length markets on the one hand and hierarchies or vertical integration on the other. A cluster, then, is an alternative way of organizing the value chain'.

In other words, if appropriately structured and if successes are achieved, clusters have the potential to become growth poles.

PURA or Providing Urban Amenities in Rural Areas is a more specifically laid out plan. It envisages three types of connectivities: physical, electronic, and knowledge. It seeks to do this by (i) selecting a ring of 10-15 villages, (ii) connecting them with a high quality transport and telecom system (iii) setting up of key education and health facilities around that ring, (iv) attracting industry and commerce to it, and (v) enabling internet connectivity. The way it is envisaged, the PURA format uses physical infrastructure and technology to physically integrate far-flung areas.

PURA however envisages attracting private initiative not only in the social sector and physical infrastructure, but also in accelerating employment-generating activities. It is

⁶ See Edward M. Bergman and Edward J. Feser (2006) The Web Book of Regional Science, Industrial and Regional Clusters: Concepts and Comparative Applications, <http://www.rri.wvu.edu/WebBook/Bergman-Feser/bibliography.htm>. The literature on economic clusters is diverse and rich and is broadly categorized as per its focus below:

- Externalities, agglomeration economies, labor pooling, and knowledge spillovers
- Innovation, entrepreneurship, concentrated development
- Inter-firm alliances, regional factor market advantages, role of non-business institutions

here that the PURA plan needs to be strengthened, and much more experience is required into how economies of scale or agglomeration economies generated by the infrastructure development can be complemented by synergistic private initiatives, and more important, how can private initiative be attracted. PURA, in its current form aims at achieving, at best, a micro-growth pole status, as the 15 odd village coverage is likely to be too small to achieve significant economies or scales within a particular village cluster.⁷

There are a few other concepts as well that should be mentioned. One such model that is sometimes confused with PURA is that of RISC (Rural Infrastructure and Services Commons).⁸ RISC concentrates all economic activity in one location so that it can catalyze economic growth through lowered transaction costs and such that economies of scale and scope are achieved. The RISC is closer to the basics of the growth pole concept in that it seeks to maximize agglomeration economies by the concentration of economic activity. It seeks to do so by having a much larger catchment of villages and therefore rural population that can be serviced. One ballpark estimate is about 100 villages. The natural advantage here is that a larger population allows for much larger scale and scope economies in service provision as well as lesser infrastructure creation.

What is India's growth pole policy?

Though the government has not specifically instituted a growth pole policy, effectively, many of its measures are aimed at ensuring high growth at the small geographical level. PURA, manufacturing clusters, and SEZs all aim at this end. But the critical question remains unanswered – why should the government have a specific policy on growth poles? Can growth poles not emerge by themselves? Indeed there are many national and international examples of spontaneously arising growth poles.

Most policy documents tend to focus on the importance of *agglomeration economies*. The argument is that increasing geographic concentration of related firms and industries leads to higher productivity. Note that there is *no* evidence that concentration of economic activity *necessarily* leads to agglomeration economies. It does so, but only in a few instances. Therefore it is not necessary that merely by ensuring concentrated economic activity a growth pole status can be achieved. Concentration might only increase the *possibility* of agglomeration economies and resultant productivity improvements. So even if the government were to mandate locational concentration of economic activity it need not necessarily lead to aggregate productivity improvements. For that to occur, at-least one more condition needs to be fulfilled – coordination between economic agents.

And it is here that there may be a case for government involvement. And that follows from the possibility that there are many geographic locations whose inherent characteristics would indicate a greater level of economic activity than is observed.

⁷ Of course, many connected village clusters, supported by PURA, could potentially become a single growth pole.

⁸ De, Atanu and Vinod Khosla, "A model for rapid rural economic development", mimeo. http://www.i4donline.net/july04/rural_full.asp

Though, of course, every location would have its own story, there is a strong case that has been made in economics literature on the need for government involvement when *coordination failures* exist.

Roughly put, and this is detailed in the next section, coordination failure models rest on a model where firms and individuals' actions and returns depend upon each other. In other words, coordination failures can arise when strategic complementarities exist between agents (firms or individuals).⁹

Consider an illustrative example where two individuals' quality of output depends on each other's skills. In period 1 each individual can invest in improving his skills at a certain cost, and in period 2 they jointly produce an output. If each individual has invested in improved skills in period 1 the output is high in period 2. But the output is low if either one, or both, has not invested in skill building in period 1. If individual A (and similarly individual B) was certain that the other will improve his skills then it would make sense for him to also invest and therefore benefit from the better output/returns.

The coordination problem is that neither can be certain that the other will invest. In such a situation there may very well be a situation where neither invests and therefore neither benefits. Despite the potential for both individuals being better off by investing more, they both end up investing less and therefore benefiting from lower returns, is the coordination failure. This, of course, is a simple and rather contrived two-period two-person example, but has been generalized to cover a large range of conditions.¹⁰

In such conditions if an outside entity (that may be the government, or a private entity) were able to either coordinate their activities, or change their expected payoffs such that they both invest more in the initial period, then the coordination failure problem can be solved. Thus greater infrastructure investments, improved provision of skill improving mechanisms, better coordination of activities, are only some means by which third parties (that may be the government, but could also be private entities) can help in the elimination of coordination failures.

The obvious link between concentrated economic activity (clusters for example) coordination failure and possible third party action is that in many cases clusters exist that are unable to move out of a low return equilibrium.¹¹ This could be due to many reasons. The failure of the various elements within a clusters to come up with a coordinated growth strategy, their failure to access funds even if a coordinated strategy were evolved,

⁹ See Jonathan Kydd and Andrew Dorward, 2003. Implications of market and coordination failures for rural development in least developed countries. Paper presented at the Development Studies Association Annual Conference, Strathclyde University, Glasgow, 10-12 September 2003. Also, Cooper, R. and John, A. Coordinating Coordination Failures in Keynesian Models. Quarterly Journal of Economics, August 1988, 441-63.

¹⁰ See Cooper, R. (1999), Coordination Games: Complementarities and Macroeconomics, New York: Cambridge University Press. Also, Cooper, R. and John, A. Coordinating Coordination Failures in Keynesian Models. Quarterly Journal of Economics, August 1988, 441-63.

¹¹ I deliberately refrain from using the term 'government' but use 'third party' instead.

or their failure to make credible commitments to each other. It could also come about due to a failure of identifying the possibility of a high growth potential. Indeed the possible causes of coordination failure are many. In such cases third party intervention could, if appropriately structured, prove beneficial.

What has coordination failure to do with the Unorganized Sector?

Precisely because of the unorganized nature of the sector, and its informal relationships that are not backed by any credible and enforceable contracts, it is difficult for the sector participants to make credible pre-commitments to each other. In other words, unorganized sector is more likely to face coordination failure due to the informal nature of its relationships. Moreover, its low education and low skill base also adversely affects the ability of the unorganized sector constituents to identify, coordinate, access resources, or implement cooperative strategies.

These issues are discussed in later sections, as also the insights from the coordination failure literature that can help us better identify and implement various means of generating growth poles.

The rest of the paper proceeds as follows. The next section discusses the role of third parties in removing coordination failures, and generating high growth in concentrated geographical areas. Section C presents a simple model and utilizes the received literature to derive 10 conditions in implementing cluster development in the Indian context. Section D then conducts a case study and evaluates a proposed cluster development initiative in Sikandra, Rajasthan. The last section concludes.

B. Coordination failure and the role of third parties

This section first discusses briefly the major reasons why coordination failures come about. It then reviews the economic literature in this area with the help of a simple game theoretic model.

As discussed before, it is well known that strategic complementarities and coordination failures go hand-in-hand. Strategic complementarities can exist due to many different reasons. These can be broadly classified as:

- economies of scale and/or thick market effects,
- problems of non-excludability.
- knowledge spillovers and

There are many different kinds of coordination failures that are due to the absence of coordination across sectors but within a particular geographical area. Airport and hotels; irrigation projects and use of HYV technologies; educational institutes and commercial entities; are some examples where mutual and geographically concentrated growth is required. What is of critical important is that the various activities in the sector need not be within a particular sector. They can span different sectors but need to be related to each other in a synergistic manner.

In such conditions what should be the role of the third party. What should be the role of the government? Before we discuss those issues we first discuss the basic characteristics of the coordination failure literature.

C. Multiple Equilibria and Coordination Failures

Consider a case where there are N workers, each has E units of labour and works $e_i \in [0, E]$. The payoff to each worker depends upon the own effort as well as that of the other workers. That is,

$$p_i = p_i(e_i, e_j)$$

Note that while we refer to workers, their effort, and their payoffs, without loss of generality, we can also refer to these as firms, their investment, and their returns.

The term *strategic complementarity* implies that the the payoff to the first worker is higher if the other worker puts in more effort.¹² Formally, this can be represented as:

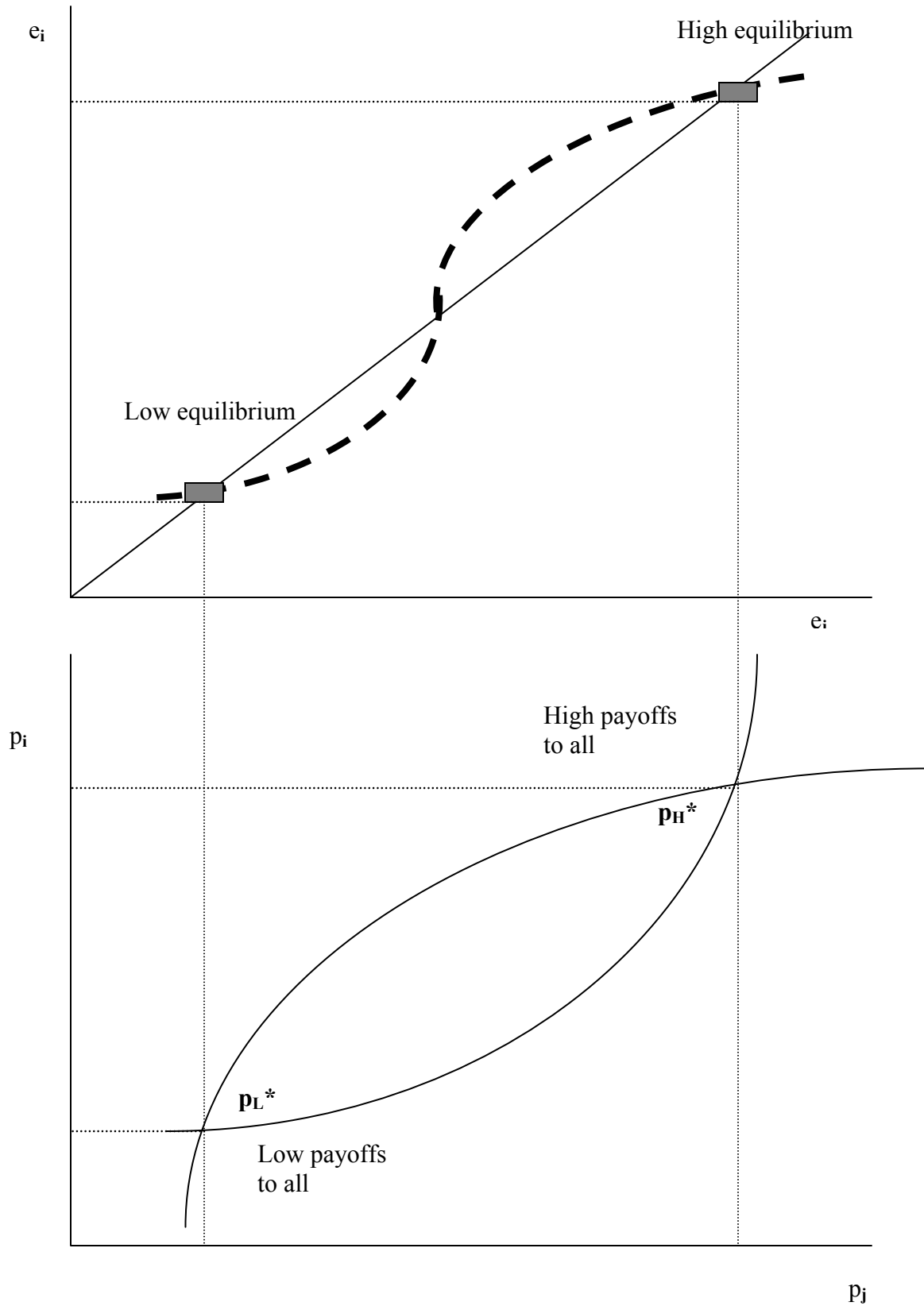
$$\frac{\partial^2 p}{\partial e_i \partial e_j} > 0$$

The critical issue here is that the payoffs for each worker depends upon the efforts/investments of the other worker as well as own.

Each worker realizes that his end payoff is dependent upon that of the other worker, and they build in this realization in their actions. In the figure below there are two points where equilibria exist. The first (marked ‘Low equilibrium’) is associated with low levels of efforts by both the workers. But there is another equilibrium (marked ‘High equilibrium’) associated with higher levels of effort by both the workers.

¹² When this term < 0 then the inputs are considered to be strategic substitutes.

Figure 1



Economic theory does not predict which equilibrium will be reached – it merely recognizes the possibility that a bad equilibrium is likely despite the existence of free and unfettered markets. In the case where the low equilibrium is achieved it is considered to be a case of coordination failure. This despite the fact that all the workers would have had much higher payoffs (p_i) had the high equilibrium been achieved.

Cooper and John (1988) show that multiple equilibria may be observed when there are strategic complementarities in the production function. Conversely, they show that multiple equilibria (and therefore the possibility of coordination failure) can only exist when there is strategic complementarity.

What does the economic literature on multiple equilibria, coordination failure and the role of government action tell us? These issues are discussed next.

1. Cooper and John ‘s result that the possibility of coordination failure) can only exist when there is strategic complementarity is important from our perspective, in that if for any reason, strategic complementarities are not present in an area, then multiple equilibria are unlikely, and as a result the possibility of coordination failure is absent. And therefore any third party action to remove coordination failure would be redundant. In other words, growth poles cannot be generated purely by third party action if the **inherent conditions are not suitable**. Mandating growth poles (one for every district, or one for every x villages) for example is not a desirable policy response to deal with such market failures.
2. A corollary to the above is that if low investment is observed in **unrelated activities** (either horizontal or vertical) it should not be interpreted necessarily as a result of coordination failure. And therefore third party action should only be attempted if the activities are related in some way.
3. There is **no need for the third party to be the government**. And this is more so in the case of small enough regions – where a private entity could create the right conditions that will generate the incentives for all to aim for the high payoff result.
4. **Large investments are not necessarily** required by the third party. This of course depends upon the nature of the coordination failure. But in many situations even relatively minor investments would be sufficient.
5. **Agglomeration economies are very different from coordination failures** and the two should not be confused. To generate adequate agglomeration economies one does not require any third party action, and these would be realized in due course. The role of policy can at best be, how to create conditions that will accelerate the emergence of agglomeration economies.¹³ However, if the potential for agglomeration economies exists, then the benefits from correcting coordination failure would be large.
6. It could be argued that in many cases coordination failures exist due to the **inability of the government to respond** to greater demand for public services or

¹³ But here as well, it should be realized that there are also agglomeration dis-economies. Examples include increased costs of inelastic assets (such as land), impact of concentrated pollution, etc.

- infrastructure. In other words, the government is unable to coordinate with the rest of the economy. In such situations the need for greater and better services and infrastructure **will be apparent**, as is the case in most if not all-urban areas, and many industrial clusters.
7. **Economic clusters** by definition are much more likely to have strategic complementarities, and therefore the potential for multiple equilibria and coordination failures; therefore third party action can be considered. Simply put economic (or industrial) clusters are geographically concentrated entities that are bound together by ‘buyer-supplier relationships, or common technologies, common buyers or distribution channels, or common labor pools’ (Enright 1996, p. 191).¹⁴ In other words, there are strategic complementarities between various agents in the cluster. In some cases, there is no coordination failure and those clusters grow without any third party action. In some other cases, there is a coordination failure problem that either the cluster association or the government, or a private third party can circumvent.
 8. The **unorganized sector clusters** are more likely to suffer from coordination failure, and therefore third party action is relatively more important in this case. (This was mentioned in the last section and is repeated here.) This is for three reasons:
 - a. Unorganized sector participants are less likely to coordinate their activities because of their inability to come up with credible formal and third party enforceable agreements.
 - b. Unorganized units tend to be managed by less educated entrepreneurs who are less able to identify the possibility of greater returns for all if coordinated decisions are taken.
 - c. As the unorganized sector is not a significant source of revenue for (local, state, or central) government, coordinated supply of public services and infrastructure are less likely to have been made historically.
 9. This perhaps the most important of all. The critical constraint is not the absence of a particular service, or infrastructure, or inputs, or technology. There is enough evidence of failures of growth centers across the world where governments attempted to fill such gaps. (See Higgins and Savoie, 1995 for example)¹⁵ Merely putting some, or a lot of physical and social infrastructure in place is not sufficient for high growth, agglomeration economies, and growth poles to be generated. A corollary to the above is: It is not necessary that high growth will be achieved if all things lacking through a value chain of a particular sector are provided. The following is essential:
 - a. Identification of the *specific* causes of low investment, low growth, and low payoff (value added) in the past.
 - b. The identification of specific remedial strategies that are in line with the above
 - c. **The ability and willingness of the units/workers present in the area to take synergistic action.**

¹⁴ We have not come across a single definition on industrial clusters that is used by the Indian government

¹⁵ Higgins, B., and D. J. Savoie. 1995. *Regional Development Theories and their Application*. New Brunswick: Transaction.

10. Different forces can lead to low growth outcomes in clusters, namely:

- a. Lack of Infrastructure
- b. Lack of Complementary Services
- c. Lack of adequate Interactions and market institutions
- d. Cost of effort required to improve productivity**

It is possible for the first three to be identified by a value chain analysis. However, the last one could perhaps be the most critical, as that is information that is not readily available and difficult to gauge. This is also perhaps the least understood.

Box: Some illustrations of coordination failures

Below are some illustrations of inherent market conditions being such that individual units are unable to access higher rewards due to coordination failure. If the various stakeholders could coordinate their activities then they could generate a first-best cooperative solution. But the inherent conditions prevent that from happening. However, a third party could help in creating conditions where it is in each unit's interest to invest more and also benefit from higher rewards.

Thin Markets

- **Skill improvement by workers:** Next reconsider the two period example of the previous section, where coordination failure arose due to the inability of the two workers to come to a cooperative agreement, and as a result both did not invest in their own skill improvement in the first period. If there were a large enough number of workers then it is likely that each worker will know that there may be some high skilled worker he could work with in period 2. As a consequence, even if one worker cannot be sure in period 1 which worker will invest in skill improvement, he can be fairly certain that there will be *some* high skilled worker in period 2 that he could jointly produce the high quality output with. In other words, when markets are thick (large number of firms and individuals) there is a lesser likelihood of these kinds of coordination failure.
- **Investment by firms:** The above example is one of two workers. But the same issues would also hold where one worker needs to find one firm, where the worker invests in skill building, and the firm invests in high quality technology.

Non-Excludability

- **Road Infrastructure:** The problem of excludability is best illustrated with following illustration. Consider a road connecting various units in a value chain. In cases where the road owner cannot exclude anyone from using the road he may be unable to recoup his investments. Even though the total increase in profits of the value chain is greater than the cost of the road, the road will not be built. Of course, public provision of the road network is the standard response to such coordination failures.

- **Effluent Treatment:** But infrastructure investments also suffer from another coordination failure problem. Consider the case where a cluster association is considering having a coordinated and cooperative solution to effluent treatment. And each unit is willing to invest the required amount for this purpose provided it ensures them freedom from the effluent disposal problem. This effluent treatment plant requires that each unit also invest in first stage treatment within each contributing unit. Since the each unit's effluent disposal is not observable some units may not invest in first stage treatment. As a consequence effluent treatment will not work. And as a consequence of this coordination failure the cooperative infrastructure solution, though beneficial to all, would fail.
- **Knowledge Spillovers:** The problem of non-excludability also affects knowledge creation by individual entities. The problem is that information and knowledge flow quite rapidly and smoothly between different agents in an area. And if geographical and cultural proximity exists, then such spillovers tend to be even more rapid. Therefore no single entity would benefit from its own investments in knowledge creation (this could be process improvements, but would also apply to new product designs).
- **Branding:** Another illustration of non-excludability is that related to branding. Suppose the customer is unable to distinguish between the products of different firms (an example is foreign consumers in export markets not knowing which firm the product is from). If the buyer is certain that the minimum quality standard is high all firms would be better off and benefit from high price realization. But since the consumer cannot differentiate, some unit would always deviate from such a cooperative solution. And therefore the most likely equilibrium is where no firm provides a high quality output.

Intermediate Goods and Services

- **Intermediate Goods:** Consider the case where a good can be produced with two technologies: a 'backward' labour intensive technology, and a 'modern' technology that requires specialized intermediate goods. If all firms use the backward technology, the market for inputs will be small, and hence there will be only a few specialized inputs, in turn making the modern technology cost-ineffective. However, if all firms were to use the modern technology the economies of scale and scope will kick-in in the intermediate goods market, making it profitable for the downstream firms to use the modern technology.
- **Intermediate Services:** Take another example where the intermediate good is a service – say design consulting. If only a few firms are interested in utilizing the services of a design consultant, it may be too costly for each firm to hire the services of good quality design consultants. The range of services required design consulting (good quality design consulting requires a very high level of specialization) would just not be viable for a thin market. If however a large enough number of firms utilize these services, this market would develop, thereby leading to greater returns for all downstream firms.

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D. Sikandra, Dausa, Rajasthan: An example

This section briefs a strategy to leverage the inherent advantages of a small economic cluster to enable it to become a growth pole. The proposed cluster development initiative seeks to benefit a roughly 1000 sq. km. area with its focal point at a small town called Sikandra in Dausa district in Rajasthan. Three non-synergistic sectors, namely – stone, carpet weaving, and leatherwork – would benefit from the initiative. This section discusses the potential of this sector to become a growth pole.

Diagnostic studies of the above three sectors were conducted before the initiative was structured. These studies reveal the following.

Sandstone: There are about 650 medium, small and micro units in the area. The units benefit from the sandstone mines in the neighboring districts. The units are involved in sandstone cutting and their products range from utility products such as doorframes, pillars, and doors to decorative items such as fountains, statues, etc. Blocks from neighboring mines are transported to the larger units that saw them into the required sizes. For decorative items the resultant blocks are then worked upon either manually or by using smaller lathes, drills, etc. to produce the particular item of the required quality and characteristics. Buyers typically provide the designs. Sales occur through orders mostly placed with individual units after a visit of the buyer to the area. The orders are spread between domestic users, traders and exports. The technology is quite vintage (about 20 years old), and the usage of new tools and machinery is limited to only a few units. Most carving is done manually, and here tool usage is even less prevalent. About 70 percent of the workers are below 40 years of age and tend to belong to the same community. Skills are picked up on the job and have been passed on from previous generations. On account of the low technology use and resultant low productivity the sector is currently quite small but has recently been growing at about 10 percent per annum.

Carpet: Manufacturing of hand knotted carpets were brought to the area about 35 years back and about 2400 artisans are currently involved in this activity. The recent fall in international demand for hand-knotted carpets would have affected the activity in the area adversely. (About 90-95% of the carpets are exported). The technology is standard for hand-knotted carpets and has more or less remained the same for many generations. Designs are either those known to the weavers from past experience or those provided by the buyers (including exporters), which is transferred to the weavers. The resultant hand-knotted carpets are then washed, dried, clipped and chemically ‘finished’. The artisans do the weaving and the rest of the processes are done by the buyer (exporter) at their premises (that are predominantly in Jaipur). The weavers are predominantly from the Mali and Muslim communities. Middlemen are quite important in this industry coordinating between the buyers and the weaver, provide the loom, inputs, set timelines, designs and set the quality standards as well.

Leather: Leather activities are limited to the making of traditional *jootis/mojaris* and unlike in the carpet sector the demand is mostly local. Five to six hundred are involved

in the activity spread over 8 villages. The households procure the raw material locally, use traditional tools, and sell in the local rural/semi-rural market (such as heaths). There are little middlemen; there is little incentive to improve quality as the current buyer is of the low price low quality type.

Should there be a cluster initiative in this area? And if so which activities should it be aimed at? In the previous section 10 issues were identified that any cluster development strategy should consider. The cluster development initiatives are briefly studied against the same 10 criteria, namely:

1. Suitable inherent conditions (Activity should be present)
2. Related activities (Presence of strategic complementarities)
3. Private initiative (not necessarily government)
4. Small investments to achieve high growth
5. Exploiting agglomeration economies
6. Need for better infrastructure is apparent
7. Pre-existing economic cluster
8. Unorganized sector
9. Possibility of synergistic action by units/workers.
10. Cost of effort required to improve productivity

Overall we find that the conditions are such that for the sandstone-cutting sector the underlying conditions support a cluster development initiative. In the case of the carpet-weaving sector the conditions are less favorable, and totally unfavorable for the leather sector.

Note that it is impossible to identify the critical factor that would differentiate between the success or failure of this initiative. This will best be achieved with an ongoing evaluation of the area. If specific actions are observed by individual entities that would show that they are investing in improving their skills, practices, and technologies *without* any subsidies or transfers from the government for these actions, then the initiative should be continued on to the next phase. If however such actions are not found then the initiative should be stopped.

In this regard it is important to differentiate between inputs, outputs and outcomes. The inputs are the various infrastructure and other initiatives. The outputs are how the various workers and firms change their behavior, and the outcome is the changes in value added and employment from each of the sectors. Note that outcomes are dependent upon many exogenous factors and short-term fluctuations. But output (how workers and firms are changing their practices) are most critical. So even if the initiative has certain outcome-based objectives (generating employment), it should be evaluated on the basis of output related measures.

Table: Cluster Development in Sikandra

Criteria	Stone Cutting	Carpet	Leather	OTHER
1. Suitable inherent conditions (Activity should be present)	Exist: 650 units and about 12000 workers currently	Possibly, but scales are currently quite low	Insignificant scales	
2. Related activities (Strategic complementarities)	Exist: b/w workers skills, newer technologies, newer markets	Perhaps: Between workers skills, and newer markets for tufted carpets	Not present within the sector	Not present <i>between</i> sectors
3. Private initiative	Strategy envisages predominantly private role supplemented by government support; contract terms between government and private entity not clear yet			
4. Small investments	Staggered investments, ongoing evaluation and every new step resting on achievement of past successes			
5. Potential for agglomeration economies	Can be achieved; but potential for dis-economies exists (dust pollution and worker health)	Can be achieved, but scales will have to be far higher	Too small a sector for any potential in the near future.	
6. Need for better infrastructure is apparent	Telecom (internet), power, well designed market-place	Telecom (internet), power, well designed market-place	No need for the given market	No current requirement for roads
7. Pre-existing economic cluster	Yes	Very small cluster	Cannot be classified as such	
8. Unorganized sector	Predominantly unorganized	Fully unorganized	Fully unorganized	Potential for benefit is high
9. Possibility of synergistic action by units/workers.	Low for worker - did not seem to be the type who would change practices (crouching and working as opposed to sitting) Moderate for units – appear to be open to invest in newer technologies	Indeterminate	Indeterminate	Changing practices should be tracked on an ongoing basis – if units and workers do not change production practices, the initiative should be stopped immediately.
10. Cost of effort required to improve productivity	Very high for workers, as new tools would require them to learn from scratch High for units	Low for workers and also for middlemen	Very high	Will require supplemental behavioral change initiatives
OVERALL	Has most conditions to achieve growth pole status	Satisfies some conditions	Few conditions satisfied but could be considered for socio-economic motives	Each initiative will be independent; economies of scope (synergies between sectors) not realized

E. Conclusion and Summary

This monograph first identifies the differences between cluster initiatives and growth poles. It identifies growth poles as a possible result of the cluster development initiatives that cannot be classified *ex ante*.

It then identifies the possible reason why cluster development initiatives might require third party intervention. Using the received economic literature it identifies this to be the case when coordination failures might exist. Then using the received coordination failure literature it identifies the possible areas of how multiple equilibria might come about and how coordination failure can result. Thus situations of low investment by workers, units and also the government are observed despite the fact that inherent conditions support much higher levels of investment and output activity. Having done this, it goes on to identify the characteristics of desirable intervention in cluster development.

More importantly it makes the case that where the unorganized sector is concerned the possibility of various market failures are much more likely due to the presence of (a) informal arrangements within and between firms, (b) low education and (potentially) awareness levels, and (c) lack of appropriate government response historically. And therefore external initiatives may be the only way of extricating the sector from the low investment, low productivity regimes.

The received literature has identified many cases where such cluster development strategies were undertaken, where each node in the value chain was studied and corrective action taken. But despite that the initiative did not succeed. The critical factor here has to do with the ability and willingness of the various entities involved (workers, middlemen, units and government) to change their practices. It has been unable to identify the factors that could lead to 100 percent success probability of such an initiatives. However if the actions and responses of individual units and workers are tracked then it would be possible to capture very early on whether such an initiative would lead to the creation of a growth pole in an area.

The monograph then takes the example of three cluster development initiatives in Sikandra, Rajasthan, as a case study. It finds that of the three economic clusters the sandstone cluster development initiative meets with most of the desirable criteria. And where the criteria are not met, close monitoring can enable better fine-tuning of the initiatives' components. The carpet-weaving cluster it appears will require much greater care in structuring as it meets fewer of the desirable criteria. The leather cluster however meets few of the desirable criteria and therefore it should be recognized that socio-economic or socio-political objectives would support such an initiative, not purely economic ones.
