



**Nuts and bolts -
Manufacturing in a slump
Tail Enders in the Recent Recession –
A case study of the Engineering Sector in
Rajkot and Coimbatore**

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Nuts and bolts - manufacturing in a slump

**Tail Enders in the Recent Recession – a case
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Rajkot and Coimbatore**

Study conducted by:

**Amita Shah, Dipak Nandani and Hasmukh Joshi
Gujarat Institute of Development Research, Ahmedabad**

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ACRONYMS

ASI	Annual Survey of Industries
CII	Confederation of Indian Industry
CMIE	Centre for Monitoring the Indian Economy
CNC	Computerized Numerical Components
GOI	Government of India
NGOs	Non Government Organizations
NREGS	National Rural Employment Gaurantee Scheme
OBC	Other Backward Classes
SC	Scheduled Castes
ST	Scheduled Tribes

I. INTRODUCTION

Engineering Sector in India: Multi-Product and Multi-Scalar

The recent recessionary trends began during the first quarter of 2007-08 and resulted in negative growth in the manufacturing sector, during the October to December 2008 period. The situation was further aggravated in the wake of the intensification of the global financial crisis that hit most export-oriented industries in India. The engineering industry represents one such case, though the impact in this sector has been relatively less severe than in several other export-oriented industries (that produce consumer goods such as automobiles, textiles, diamonds, garments, leather manufactures) and in the construction industry.

The engineering industry is characterized by wide-ranging products and has a spatially diversified nature. The sector consists of a large number of intermediate and capital goods industries, and therefore, has significant backward linkages with many vital sectors in the economy, including agriculture (Morris, 2006). The sector is also characterized by a fairly long value chain, entailing a number of processes namely foundry, casting and forging, machining, parts and component manufacturing, assembly and transport, etc. The major end-user industries for heavy engineering goods are power, infrastructure (including real estate development), steel, cement, petrochemicals, oil and gas, refineries, fertilizers, mining, railways, automobiles, textiles, etc. Light engineering goods are essentially used as inputs by the heavy engineering industry. The engineering sector in India has been riding on the back of the growth in the user industries and the several new projects being undertaken in various core industries such as railways, power, infrastructure, etc. Capacity creation in sectors such as infrastructure, oil and gas, power, mining, automobiles, auto components, steel, refinery, consumer durables, etc., has also been driving the growth of the engineering industry.

Given the diverse nature of the products and processes, the sector is spread across all the four use-based industrial groups viz; capital and intermediate goods, basic and consumer goods; with a larger presence in the first two groups of industries, with a weight of 9.3 and 26.5 in total manufacturing production (Government of India (GoI), 2009). Estimates for 2004-05 from the Annual Survey of Industries (ASI) suggest that machinery and equipments (other than electric and transport industry) covered under NIC code 29, accounted for nearly 6.9 percent of the total number of factories; about 5.1 percent of the net value added and 5.2 percent of the workers in the factory sector. This, however, leaves out a large segment of the informal economy, which operates at the tail end of the production chain, and consists of tiny and micro enterprises, sub-contractors, job workers, etc.

The informal sector also has a substantial share in India's manufacturing exports. In 2008-09, the sector accounted for 26 percent of the manufacturing exports; of which machine tools, machinery and instruments accounted for 6.5 percent, transport

equipment accounted for 6.6 percent and the manufacture of metal (primary and semi-finished iron and steel) accounted for about nine percent of exports (CMIE, 2009).

Scalar Structure

The engineering sector is relatively less fragmented at the top, as the competencies required are high, while it is highly fragmented at the lower end (for example in the production of unbranded transformers for the retail segment) and is dominated by a number of smaller players. Most of the larger units are engaged in the production of heavy engineering goods and produce mainly high-value products, using high-end technology. The requirement of high level of capital investment is a major entry barrier.

The light engineering goods segment, on the other hand, uses medium to low-end technology. The entry barrier is low, on account of the comparatively low requirement of capital and technology. This segment is characterized by the dominance of small and unorganized players, who manufacture low-value added products. However, there are few medium and large scale firms that manufacture high-value added products. The capacities in these units are small and there is a high level of competition among the players. It is these small/tiny producers as well as the workers are those who are likely to get hit first and the most, when fluctuating and recessionary trends prevail in the market.

According to available estimates, there are about 840,000 workers in the machinery and equipment industry. About 95 percent of the units and 58 percent of the workers were in the unorganized (non-factory) sector. Besides these, there may be large number of home based workers who take up job work for enterprises across the scalar ladder.

Migrant Workers and Seasonality

A substantially large proportion of the workers in Gujarat, who are engaged particularly in foundries and forging-casting come from states like Uttar Pradesh (UP), Orissa and Bihar. Some of the processes involve hard manual labour, under harsh conditions, as they require working on foundries and machines, with high tension electric power during the summer months. Local workers are often reluctant to undertake such tasks. Workers from other states tend to visit their home towns during the festival and harvest seasons, thereby creating seasonal fluctuations in labour supply. Besides this, the sector has backward linkages with agriculture and forward linkages with consumer products (like automobiles) and with the construction industry. This often makes it vulnerable to cyclical fluctuations with three good years, followed by one bad year, in terms of turnover and employment.

The recent recession has pushed many migrant workers to extend their stay in their places of original residence, especially after the Holi festival (around March 2009).

Apparently many of them were also operating as job workers or sub-contractors to medium and large units.

High Material Cost

Given the fairly high component of raw material and inputs costs, especially of pig iron, coal and oil, the sector is particularly vulnerable to fluctuating prices in the international market, especially in the wake of the liberalization of imports during the last year. The sudden rise in the prices of oil and coal during the early part of 2008 had already jeopardized production and liquidity in the sector, and it has slowed down further, due to the seasonal slump in the supply of migrant workers on the one hand and the credit squeeze, on the other. The average price of crude oil (Indian basket) was US\$105.77 per barrel, during April 2008, which increased to US\$132.47, in the next three months. The raw material cost thus increased by about 38 percent to 44 percent, during the first two quarters of 2008-09 (GoI, 2009). Since these inputs constitute a major part of the raw materials for a large number of industries, price increases in these sectors led to a cascading effect on the cost of production. For instance, raw material costs account for about 50 to 60 percent of the total cost in foundries - a segment with widespread linkages within the engineering sector. This in turn has led to a sharp decline in the profits of the manufacturing sector, making it difficult for it to revive.

Growth Performance: The Double Squeeze

The performance of the engineering sector, in the wake of the recent recessionary period, has been fairly varied, across the various sub sectors or industries. According to the latest estimates, intermediate goods industries were the worst hit, during the

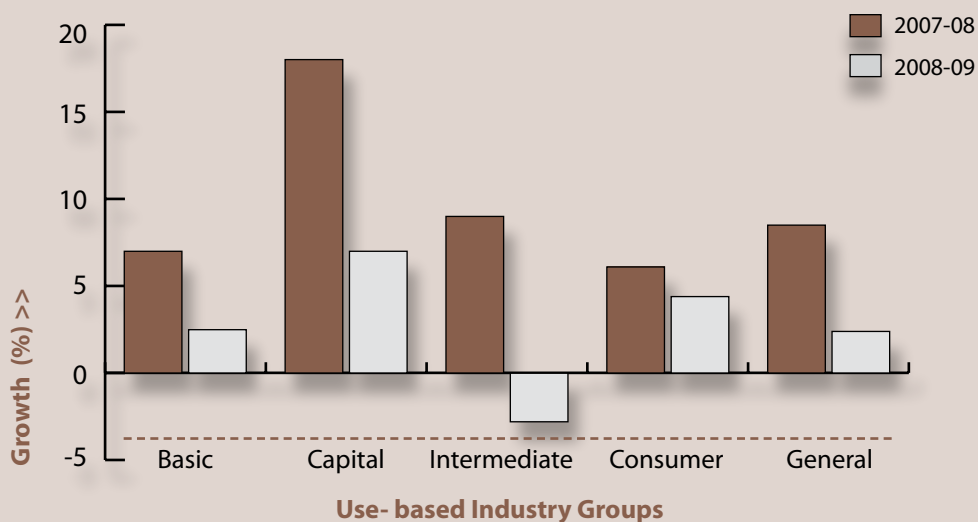


Figure 1 Growth of Industrial Production by Use-based Industry Groups

Source: Economic Survey, 2008-09, Government of India

last quarter of 2008-09, whereas the capital goods industries, especially machinery and equipment, were one of two industry groups, that registered high growth (the other group was tobacco and beverages).

Machinery and equipment industry accounted for as much as 62 percent of the production of the manufacturing sector, in 2007-08 and in 2008-09. The contribution of metal products was about 18 percent and that of transport equipment was about five percent (Gol, 2009). The performance of engineering exports has also shown a very diverse pattern across the various sub sectors (see Figure 2).

The sector already faced significant volatility, mainly because of the sudden rise and then the subsequent fall in input prices. Subsequently, the sector faced another shock due to the global financial crisis and the resulting decline in exports and foreign investment. The associated devaluation of the rupee against the strengthening US dollar only made things more difficult. Unfortunately, official data reflecting the post April 2009 period and its impact on industrial production is not available. What is however recognized is the 'double squeeze', witnessed by several industries,

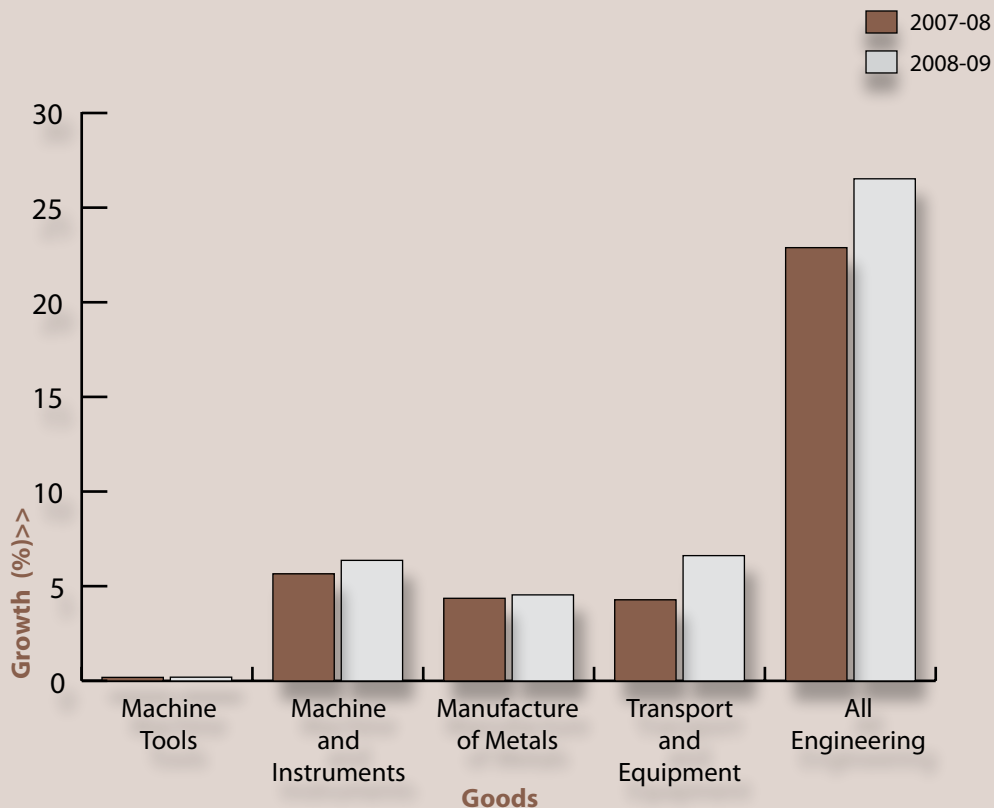


Figure 2 Performance of Indian Engineering Exports

Source: Economic Survey 2008-09, Government of India

including the machinery-equipments and component industry. The 'double squeeze' refers to the decline in the export demand and the subsequent decline in domestic demand (Gol, 2009).

The recent recessionary trends, when super-imposed on the already complex structure of production organization and the seasonality in labour supply, led to a compounded adverse impact on thousands of workers, especially those at the tail end of the production chain, in the diversified and multi-product sector. The adverse impact has been felt selectively and unevenly across different processes and sub-sectors within the engineering sector.

Given the vital role played by the engineering industry in the economy, the sector deserves special attention, when assessing the impact of the economic slow-down.

This analysis tries to capture the impact on workers and enterprises, focusing mainly on machinery-equipment and the components industry, in two major engineering clusters in the country - Rajkot and Coimbatore. The analysis presents a brief profile of the sector, both at the national level and at the cluster level.

Objectives and Methodology

The immediate focus of the study is to empirically examine the impact of the recent recession, especially on workers and micro enterprises in the informal sector and to address some of the larger issues pertaining to the impact. These are:

- Has the recession affected different product lines in different ways? Does scale and informality matter?
- Are the workers more vulnerable than the enterprises?
- What are the different mechanisms that these segments use to cope? What are the implications for labour markets?
- What are the implications for enterprises, workers and households?
- Can the end of the recession/crisis take care of the structural dysfunctionality affecting the tail enders in the production chain?

While this study, given its limited scope and the limited time, may not be able to provide definite answers to these questions, nevertheless, an attempt has been made to reflect on these issues, both in the empirical enquiry and in the discussion that follows.

Methodology

The study is based on a quick assessment of the impact of the economic slow-down experienced by the enterprises and its consequences for the workers, particularly in the informal segment, within the engineering industry in Rajkot and Coimbatore.

	Rajkot	Coimbatore
Workers	120	123
Enterprises	30	40

In Rajkot, the analysis draws mainly on primary data collected from 120 workers and 30 micro enterprises, operating in Rajkot city. The sample of workers has been drawn from

three categories: (i) those living in colonies/residential areas, in proximity of the major conglomeration of units in the sector; (ii) those living on the outskirts of the city; and (iii) teams of labour especially from other states, (these constitute a substantial part of the labour force in the engineering industry in Rajkot and elsewhere in the country). Identification of the micro enterprises was based on the information provided by informed persons in the industry and by workers. Detailed discussions were held with several informed persons in the industry, which helped in getting a larger perspective of the industry and the impact felt by different segments in the industry, across varying size and product lines.

In Coimbatore, the research covered 123 workers and 40 enterprises, in the engineering industry, located in the city. Selecting the sample of workers however, was somewhat difficult, as those who had already left the sector/city due to the impact of the crisis were least likely to be represented, especially in the absence of information about their new places of work. One possibility was to trace such workers by visiting the workers' colonies or areas where the workers generally live. There were two problems in following this route. First, it was difficult to access prior information about the sectoral affiliation of the workers, who may have been affected due to the crisis, especially when the focus was to capture those who worked in the sub sectors of the engineering industry. The second difficulty arose from the fact that unlike cities like Rajkot, Ahmedabad and Surat, the settlement pattern of workers in Coimbatore is fairly scattered and dispersed; identifying workers in the specific segment would require far more time than what was available for the present study. As a result, a large majority of the workers covered under the survey were contacted on the work site, and about two thirds of them did not report any direct impact of the recession.

Another difficulty faced during the survey was the fact that the sector has been facing a slow-down, for more than a year, and the major reason for decline in production has been erratic power supply¹ as against the recession, per se. It was therefore difficult to discern the impact of the economic crisis during the study period viz; October 2008 to March 2009. While, the situation relating to poor power supply has not been looked at in this study, the overall scenario appears to be fairly grim, as nearly 50,000 workers have lost their jobs in the sector.

1 It was alleged by a number of small/tiny enterprises that power cuts that occurred for four to five hours a day, were because power was diverted to cater to the demands made by the multinational corporations, located in the state.

2. PROFILES OF THE ENGINEERING SECTOR IN RAJKOT AND COIMBATORE

Rajkot and Coimbatore together represent a large segment of engineering clusters, specializing in machine tools, agricultural machinery and casting and forging (Gol, 2004). Till the late nineties, these two places were ranked as the top two engineering clusters in the country and they accounted for more than 70 percent of the diesel engines and submersible pumps produced in the country. Rajkot has lost out in the production of diesel pumps and diversified into metal products but Coimbatore has retained its position as the largest producer in pump manufacturing. At present, both these clusters rank in the forefront of general purpose machinery and components in the country. Brief profiles of the engineering sector in the two clusters are presented here.

Profile of the Engineering Industry in Rajkot

Rajkot city, with a population of about 1.5 million people, represents one of the most important industrial hubs in Gujarat, next only to Ahmedabad, Surat, and Vadodara (Awasthi, 1997). It was here that Asia's first industrial estate was set up, in the late fifties, and the city soon emerged as one of the most important clusters for small scale engineering in the country, specializing in diesel engines and their components (Kashyap and Shah, 1995). By the turn of the century, the Rajkot cluster had a 60 percent share in the production of slow speed diesel engines with an annual production of 300,000 engines (Basant, 1997). Diesel engine manufacturing however, received a major set back in the wake of technological development (driving a shift towards electric pumps) and due to the disparity in the raw material prices, which led to the industry losing its competitiveness in the export market. The cluster has developed into a diversified engineering cluster, with wide ranging product lines and processes, and strong inter-firm scalar linkages (Shah, 1994). The cluster has the distinction of having three to four (out of an estimated total of 15) major units of computerized numerical components² (CNC) in the country; and one of these CNC units is emerging as the largest unit in the country.

While, there is no systematic estimate of the number of units and workers in the engineering industry in the city, information from the third census of small scale industries during 2001-02, suggests that there are a total of 1,900 units with 8,000 workers engaged in the machine tools and parts industries. In addition, there are about 400 units, with an estimated employment of 1,300 workers, in registered small scale auto parts units in Rajkot. This appears to be a gross under estimate, as the bulk of the workers in the sector are either self employed as job workers, or are not listed

2 Each of these CNC units employs about 400 workers on the shop floor.

on the pay rolls of the registered small and large scale units, as is common in the manufacturing industry all over the country. According to the information provided by the Rajkot Chamber of Commerce, the Rajkot cluster consists of the following major industries – CNC, conventional lathes, casting and forging, diesel engines and auto parts; with a total turnover of about Rs. 23,000 million. Of this Rs.16,000 million is from the various sub sectors of the engineering sector. These estimates, once again, do not reflect the large number of unregistered small and tiny units and the far greater number of informal workers operating at the tail end of the value chain in the sector. According to the officials of the Rajkot Engineering Association, a premier organization in the country, the size of the industry is likely to be as follows:

Size of the Industry in Rajkot		
Sub sectors	Approximate number of units	Approximate number of workers
CNC	3 – 4	1,200 (excluding those engaged in services such as cleaning and maintenance, transport, job work)
Conventional Lathes	300	3,000 - 4,000
Casting and Forging	4,000	NA
Diesel Engines (assembling and components) and auto parts	1,000 – 2,000	15,000 - 20,000
Job Workers (foundries, auto parts, forging)	–	70,000
Others (in related services)	–	30,000
Metal Products and Jewellery	200	NA

It is estimated that about 150,000 to 200,000 workers are engaged in the engineering industry, in the city. According to Census 2001, the city had 295,000 main workers in activities other than cultivation, agriculture labour and household industry. This however, may leave out those who commute from surrounding villages and some of those who have migrated from other states. The engineering industry is thus the backbone of the economy of the city and of the region. An important feature of the Rajkot industrial cluster is that it is located in the heart of the dry land agriculture region, which is highly vulnerable to drought. Employment in the secondary and tertiary sectors therefore is an important drought-proofing mechanism in the region. The city has strong links with capital mobilized from the agriculture sector, which has a significant multiplier effect on the region's economy.

How far has the 'double squeeze' impacted the engineering sector in Rajkot? This question is discussed in the light of the empirical results in the later part of the analysis.

Profile of the Engineering Industry in Coimbatore

Coimbatore, known as the 'Manchester of the South' is another major cluster for the engineering industry in the country. Its industrial origins go back to the early part of the last century, when the city began to cater to the needs of the textile mills, which were set up in and around the city. A number of engineering units, especially foundries and fabrication units, were set up in the initial phase. They started manufacturing spare parts, which were required for these mills. This prepared the foundation for the development of several other sub sectors of the engineering industry, such as pumps, motors, foundries, engineering units, machine tools, fabrication, furniture, CNC machining, wet grinders, agricultural machinery, textile machinery, plastic components, jewellery, etc. during the later part of the century (Subramanian, 2009). In this sense, there is a fair amount of similarity between Rajkot and Coimbatore, although the latter has had a longer history and has immediate links with the textile industry in Tirupur, which is in close proximity to the city.

At present, the Coimbatore-Tirupur cluster is a major hub for textile engineering production, housing about 40,000 units and employing between 800,000 to 1,000,000 workers. Of this, the engineering sector, accounts for approximately 15,000 units, mainly in the small and tiny sector and employs about 300,000 workers - directly and indirectly. A majority (about 60 percent) of the workers in the engineering sector are skilled. As many as 70 percent of the units were set up before 2000; the remaining 30 percent are of more recent origin. These units were set up mainly in response to the export boom, experienced in the post 2000 period.

During the 1990s, the industry was faced by a severe recession which was worsened by the impact of the serial bomb blasts that occurred in Coimbatore, in February 1998. It took almost four to five years for the industry to recover. In 2002, textile demand began to look up, and the demand for textile manufacturing equipment followed. The industry began to diversify into the manufacture of automobiles and valves and also began looking at export markets. Till then, it was mainly dependent on the textile sector for its orders. In 2002, the city's auto-component industry went in for exports in a big way³. For many companies, the share of exports (in total revenues) went up from 10 percent to 25 percent. Though the risks are higher, the margins are better in exports.

During 2005-06, exports accounted for Rs.3,500 million of the total turnover of Rs.25,000 million of the engineering industry in Coimbatore. For 2006-07, Confederation of Indian Industry (CII), Coimbatore, had set a target of Rs.33,000 million for production and Rs.4,250 million, for exports.

The recent recession, coupled with the power cuts, has cast a shadow on various segments of the engineering sector.

3 Pricol, for instance, has seen exports grow from Rs 220 million in 2000 to around Rs 600 million in 2006. Many of the micro level units got good sub orders from Pricol.

3. MAIN FINDINGS FROM THE SURVEY OF WORKERS

This section presents findings from the workers' survey, which covered samples of 120 and 123 workers, in Rajkot and Coimbatore, respectively. The findings cover three major aspects: (i) the profile and the conditions of work; (ii) impact on employment and earnings; and (iii) consequences and coping mechanisms.

A (i) Profile of Workers in Rajkot

The main features of the respondents covered by the primary survey in Rajkot are:

- As many as 51.7 percent of the workers belonged to the category of other backward classes (OBC), 25 percent belonged to the scheduled castes (SC) and 23.3 percent to other communities. Most of the workers represent socially marginalized communities.
- About 47 percent of the workers were in the age group of 20 to 30 years, whereas 44 percent were older and nine percent were less than 20 years of age.
- As many as 40 percent of the workers were either illiterate or had studied only up to primary school and 43 percent had studied up to X Standard.
- A large proportion (48 percent) of the workers had nuclear families, whereas 24 percent were unmarried or lived alone in Rajkot.
- A majority (51 percent) of the households lived in rented premises and 44 percent lived in 'own' houses; the rest have been given accommodation by the employers on the work sites. Nearly 40 percent of the workers live in *kutch*a (temporary) houses and another 35 percent live in *semi-pucca* (semi-permanent) houses.
- Nearly two thirds of the workers were skilled and only four percent were unskilled workers. Almost half of the sample workers (48 percent) have been working in the sector for less than three years; 32 percent had experience ranging from three to nine years, and the remaining 20 percent had more than nine years of experience in the sector. Experience was directly related to the age of the worker.

The data suggests that only 3.3 percent of the workers belong to Rajkot city, about 42.5 percent came from other parts of the district and another 30.1 percent from other districts in Gujarat. About 24.1 percent of the workers in the sample were from other states. Nearly 91 percent of the workers had work for more than nine months during the last year.

A (ii) Impact on Employment and Earnings

Nearly 70 percent of the workers in the sample were daily wage earners, 20 percent of the workers were regular employees, and the remaining 10 percent were contract

workers, before October 2008. The proportion of regular employees declined to 17.5 percent, in the post October period (Table 3.2). Daily wage earners are more or less sure of getting work from the same employer, as long as the employers have a demand for labour⁴. Only nine out of the 120 workers reported that they get paid for holidays, and very few of them are covered by Provident Fund facilities or health insurance.

Those working as skilled workers especially in foundries, on lathes and machines, often work on relatively better terms of employment than others, irrespective of the actual status of employment as 'regular' or 'daily wage earners'. In that sense, there is rather a thin line between the two categories of employment. The world of informal work, as widely documented, is a complex web of various mechanisms that ensure flexibility yet assured supply of labour when needed; social networks and contracts including credit and other small favours are part of this complex web. Workers in the engineering sector in Rajkot are no exception to the uncertainty and poor working conditions that have become a hallmark of the informal sector in India.

As large a proportion as 75 percent of the workers were being paid on a daily basis, about 12 to 13 percent received piece rate wages and the rest were paid on the basis of weight of the material processed. This situation, has not changed much since October 2008.

Labour Adversely Affected Due to the Crisis

The recent recession has adversely affected 82 percent of the workers, in the sample. Only 21 out of 120 workers escaped the adverse impact. These workers came from different social groups and had varying degrees of work experience. While no systematic association between social groups and the adverse impact was found, about half (i.e. 13 out of 21) of the workers that did not report any adverse impact were those with less than three years of experience. This may be because these workers already had fairly adverse terms of employment.

The main reason for the adverse impact is reduction in the turnover (57 percent) followed by downsizing of the unit (38 percent); only five workers reported closure of the unit as the cause for the decline/impact on their employment. Since most of the workers in the sample were employed in small/tiny units in the informal economy, reduced turnover and downsizing of the units, both, had more or less the same connotation. The real issue is that both the enterprises as well as the workers were affected; the brunt of the impact was faced by the former and was passed on the latter almost immediately, as the small/tiny enterprises hardly have any capacity to hold on, especially in situations, where input prices have been fluctuating and the forward channels of building inventories have more or less dried up.

4 These workers often get credit/advance money and bonus (during Diwali) and are also given long leave (for a period of one or two months, every year) without any salary.

NO JOB, LIMITED SKILLS, BORROWING FOR CONSUMPTION NEEDS THE ONLY WAY OUT

Nileshbhai Ramanuj is 31 years old, and has studied up to Standard X. He is currently unemployed because the unit he worked in, has closed down. There are six members in his family, including three children and he is the only earning member. He has been working in the same engineering unit for the last 15 years and was earning Rs. 6,000 per month.

Losing his job is only the beginning of the storm that has struck Nileshbhai's life. He was paid around Rs. 100,000 at the time of retrenchment and he deposited that money in a private bank. Unfortunately, he lost the money, because the bank was liquidated. This was followed by another set back which took place when he started trading in onions, which he brought from the Kachchh district, in Gujarat. Since he had no prior experience of such trading, he lost another Rs. 1,500 in the process. He has finally resorted to casual work, which pays him less than Rs. 1,000 per month. The burden therefore has fallen on his wife, who is trying to help out by undertaking small jobs such as stitching and embroidery.

The crisis still continues and keeps increasing every day, resulting in tension and conflict within the family. Nileshbhai has already borrowed Rs. 27,000 from family and friends; his search for an alternative occupation is still on. He says that the final step is that he may be pushed to suicide, if nothing works out.

An enquiry into the difficulties resulting from the adverse effects of the recession on work, elicited a variety of responses. The findings are based on multiple responses and are presented in Table 3.3 in the Appendix. Of the 99 workers who reported having suffered the adverse impact of the recession, 44 workers reported a change in terms of employment. To a large extent, this covers those workers who now receive a lower payment for the same amount of work and/or having to do low-skill jobs. A large number of workers reported various other difficulties, especially pertaining to reduced work and time spent for searching for new/additional work. Only seven workers reported that they had to travel longer distances; six workers had to change accommodation; and two workers had to shift from skilled to unskilled work.

The above observations, however, need to be seen in the light of the fact that the sample consists of those who were still in and around their original work place. It excludes many of those who had already gone back to the villages and/or changed their place of residence or nature of work. In an attempt to counter this limitation, workers were contacted at their residence and at some common meeting places such as *paan*⁵ and cigarette shops, etc.

5 *Paan* refers to the *paan* leaf which is combined with lime, betel nut and additional cordiments and is eaten as a digestive.

Impact on Earnings and Incomes

An attempt was made to ascertain the impact of the loss of work on the earnings of workers. The data suggests that 92 percent of the workers experienced a loss of income after October 2008. The loss of income was found to be highest among those with a medium range of experience in the sector; for those who had joined recently, not much change was registered, as they had not attained high enough levels of earnings, a point noted earlier.

Table 3.4 presents the distribution of workers across different classes of household income, before and after October 2008. The income levels in any case were fairly low among the households, even prior to the cut-off time period. For instance, nearly 69 percent of the respondents reported household incomes in the range of Rs. 2,000 to Rs. 5,000 per month, before the crisis. Taking a mid-point income level of Rs. 3,500 per month, the annual income works out to Rs. 42,000. While this appears somewhat better as compared to the benchmark poverty line incomes in urban India, it is important to bear in mind that several of these households may have their extended families to support back home, in their original place of residence. Nearly 27 percent of the sample reported incomes of more than Rs. 5,000 per month, and only four percent of the sample had monthly incomes in the range of Rs. 1,000 to Rs. 2,000 per month. These were likely to be single person units.

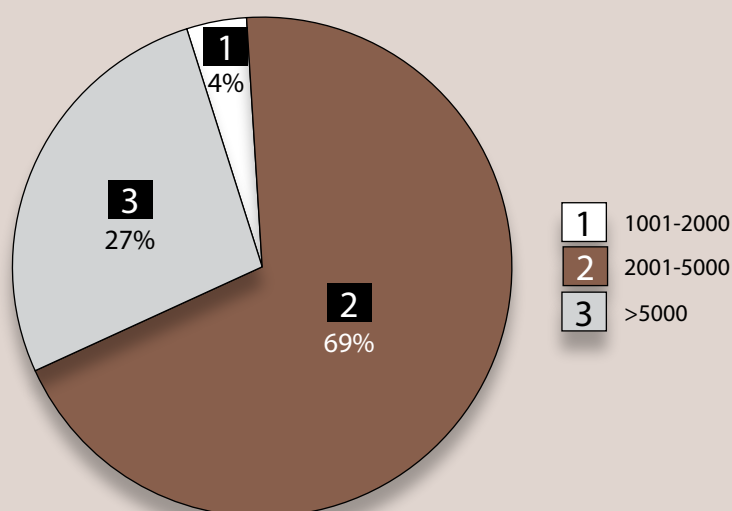


Figure 3a Distribution of Workers according to Levels of Household Income (pre October 2008)

The changes documented in the period after October 2008 are quite alarming. Nearly 21 percent of the respondents had slipped into the low-income category (less than Rs. 2,000), of which 17.5 percent had incomes in the range of Rs. 1,000 to Rs. 2,000 and 3.3 percent (four households) had slipped even below the Rs. 1,000

per month level. There seems to be a progressive downfall; about 16 percent of the households experienced steep declines in their incomes, largely in the highest income category (above Rs. 5,000) (see Figures 3a and 3b).

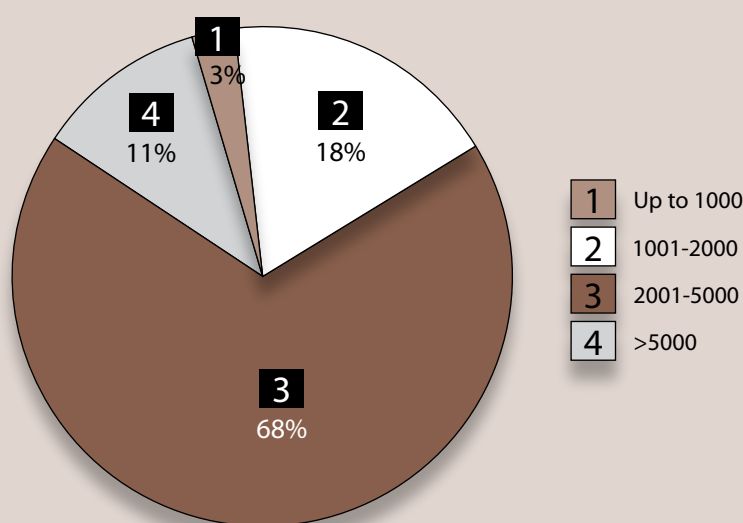


Figure 3b Distribution of Workers according to Levels of Household Income (post October 2008)

The decline in household income is largely due to the lower wage rate paid to the workers. This emanates from the observation made earlier, that a large proportion of the workers had reported 'more work for the same payment' or 'reduced quantum of work' as the main change on their terms of employment. While most of the workers (75 percent) are on a per day, or on piece rate basis (12-13 percent), daily earnings depend on the quantum of time (in terms of hours/shift) worked or the quantum of work produced. Since both these are fairly variable, it is difficult to compare wage rates before and after the crisis period. Total earnings per day have been used to compare the impact over the two reference periods.

As expected, a significantly large proportion of the workers (80 percent) reported that their daily earnings have reduced after October 2008. The reduction is from approximately Rs.180 per day to Rs.138 per day (Table 3.5). This is fairly substantial. What makes it worse is that a large proportion of the workers (55.6 percent) also reported reduced number of work days, per month. The average reduction was from 25 days to between 17 to 20 days, per month. A similar reduction in work days was also experienced prior to October 2008, when the sector was facing a severe squeeze, owing to fluctuating raw material prices and volatility in exports as discussed earlier.

SELF EMPLOYMENT IS THE DREAM

Prakashbhai Hunbar, is 20 years old and has studied till Standard IX. He is a skilled worker, and has been working on the lathe machine for the last three years. There are four members in his family – his parents and a brother. His father's ill-health pushed Prakash to take up work, later he was followed by his brother. Prakashbhai lives in a one-room house. The impact of the crisis is apparent in his reduced working hours, from 12 to eight hours per day, and the loss of income due to 'overtime'. Two other workers in the factory have been already laid off and another three are called only when needed. His income has reduced from Rs.160 - Rs.175 to Rs. 90 - Rs.100, per day. The number of days worked is usually 25, per month. There was an income loss of approximately Rs.1,500 per month, for each of the two brothers.

The consequences are that the father has had to resume his original work, as an auto rickshaw driver. Prakash has taken a loan of Rs.10,000 but is still unable to bear the medical expenses for his father. He has begun to buy grains from the fair price shop.

In the future, the brothers want to buy an auto rickshaw, by taking a loan. They plan to pledge their mother's jewellery to generate the Rs. 45,000 required for the down payment. This will give the brothers a chance to be self employed, in case they lose their jobs in the industry. The next step is to find alternative employment, within the city and if that does not happen, to return to the village. Prakashbhai expects the Government to help the industry to get out of the recession.

Prakashbhai's story is an oft repeated tale, only the characters keep changing.

A (iii) Consequences and Coping Mechanisms

What were the consequences of loss of work for the family of the workers? This question was examined in detail (see Table 3.6). As many as 57 percent of the respondents reported that there had been an adverse impact on the food intake - in terms of quality or quantity or both. Nearly 41 percent of the respondents reported difficulty in seeking medical treatment; this included responses like shifting to cheaper services, postponement of treatment or resorting to self-treatment, etc. Similarly, 20 percent of the respondents said that the reduced income has impacted children's education but none of them reported that the crisis had pushed them to withdraw their children from school.

Another set of adverse consequences pertains to the stress in terms of payment of rent (34 percent), sending remittances to the families in their native places (31 percent) and the cost of transportation for travel to the work place (23 percent). Those

reporting difficulties related to transport referred mainly to resorting to cheaper means to commute to and from the place of work.

About four percent of the households reported pushing children and older persons to work and 10 percent reported pushing women to paid work. This has resulted in an increased work burden on women. These figures are likely to be underreported, as reporting such consequences is not usually considered 'socially correct' in the local setting. Similarly, when asked about changes in the consumption of tobacco or liquor, etc. the responses were fairly well guarded. For instance, 33 percent of the respondents said that they have reduced the consumption of such commodities, so as to cut back household expenses. While this may be true, it is not entirely clear if the impact was the other way round i.e. the consumption may have actually increased for some households. Alcohol consumption is illegal in Gujarat, since there is prohibition in the state and the reliability of these statements is therefore questionable.

Lastly, the largest proportion of workers (69.2 percent) reported mental stress resulting from the situation at work. Also 27.5 percent of the workers in the sample said that this has increased tension and conflict within the family. It is not quite clear as to what the nature of mental stress is and how far it is caused due to the economic crisis, especially the post-October developments. At best, all these responses may be treated as a cumulative effect of the slow-down before October and an intensification

DOWNTURN IMPACTS EDUCATION OF CHILDREN

Rameshbhai Solanki is 37 years old and has studied till Standard VIII. He used to work in a garage unit earlier and has now been working in an industrial unit, for the last one year. He belongs to the SC community. There are five members in his family and they live in a one-room house which is owned by him. Rameshbhai was earning Rs.150 per day earlier and is now getting only about Rs. 80 per day. The unit where he worked initially has closed down, but he has found work in another unit. His working hours have remained the same but the wage rate has reduced. At the same time, the cost of transport has increased, as he had to change his place of work. In order to cope with the situation, his son Ajay (age 17 years) has also taken up work in the industry, as a helper in a similar unit; he earns Rs.1,500 per month.

As a consequence, Rameshbhai has discontinued private coaching for the children. He has already borrowed Rs.10,000 and has spent his own savings of Rs. 5,000; he has stopped sending remittances to the family back in the village. If the situation does not improve in the next few months, he plans to go back to the village and start farming.

The family has a small retail sari shop which they have taken on rent. They would like to expand it to meet their household expenditure. However, they have closed it, as no credit is available to run the shop.

after that. The socio-cultural conditioning leads people to under-report several of the adverse impacts, which may be labelled as mental stress. Figure 4 shows a fairly grim situation.

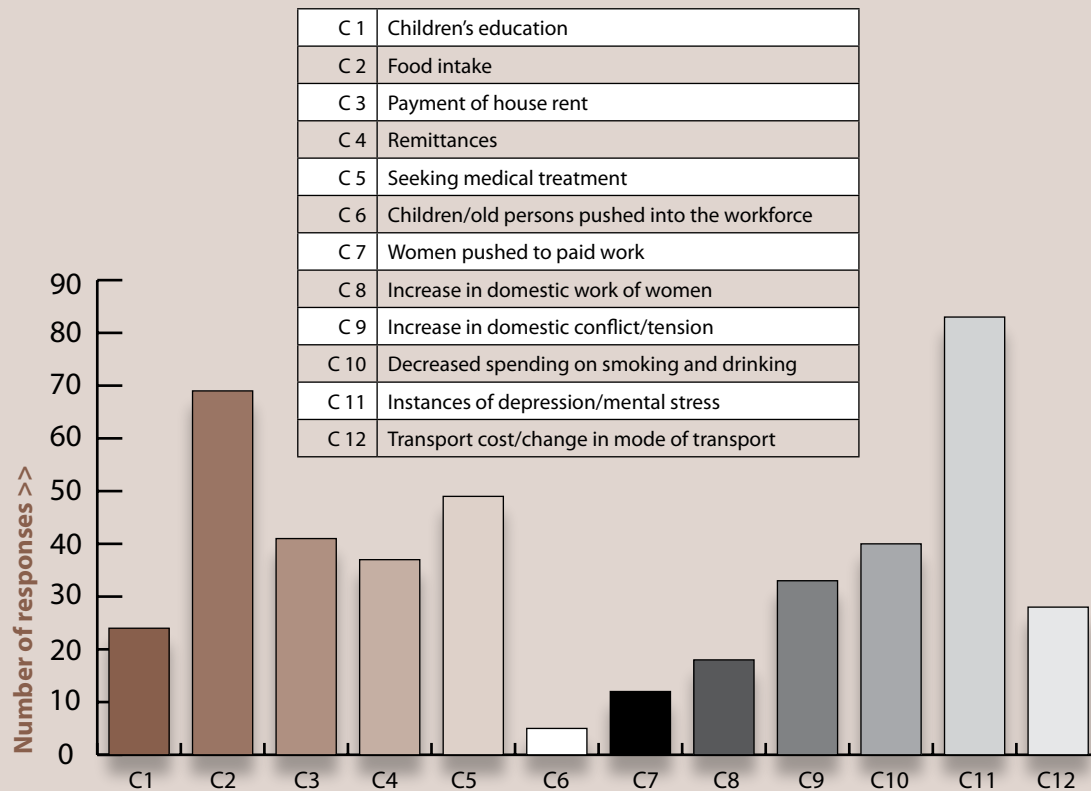


Figure 4 Consequences for the Family

Coping Strategies

Several workers resorted to various forms of dis-saving and to taking loans in an attempt to cope with the loss of livelihoods and income. It was observed that 53 percent of the workers had spent their past savings and 31 percent had resorted to borrowing. Only 11 percent reported pawning of assets and six percent reported selling their assets (see Table 3.7). The proportion of households resorting to various forms of dis-saving was found to be somewhat higher among those with medium number of years of work experience, as compared to those with a longer number of years in the sector; those who had joined the sector in the last three years did not reveal any clear pattern.

Of the 138 responses, going back to the original place of residence was the coping mechanism which was repeated most often (45 responses), followed by shifting to a new activity/occupation (37 responses), in third place was the idea of looking for work in other cities (28 responses). On asking whether the respondents know about other workers in

similar situations, the respondents suggested similar coping strategies, which had been adopted by at least one other worker about whom they had direct information.

What are the likely implications on the rural economy if these workers actually go back to their villages? This is an important issue that needs further examination.

RETURN MIGRATION IS AN OPTION

Sanjaybhai Gadhavi is 25 years old and has studied upto Standard VII. He belongs to the OBC category, is unmarried and lives in a two-room house, along with six other members. Sanjay worked on a lathe machine in an engineering unit and earned Rs. 3,000 per month. Now, he is working as a casual worker, as the unit where he worked closed down about three months ago. At the moment, he earns between Rs. 1,500 to Rs. 1,800 and he has already borrowed Rs. 10,000 from friends to make ends meet. His brother, who is a performing folk artist, has reasonably good income and is able to support Sanjaybhai. Despite family support, he feels let down and is very depressed. He thinks that the Government must assure work and appropriate remuneration as well as adequate credit facilities. He is contemplating going back to the village to find employment under the National Rural Employment Guarantee Scheme (NREGS).

Expectations

What expectations did those affected by the crisis have from the Government, their own families, employers and non government organizations (NGOs)? The largest proportion (38 percent) of the respondents said that they had no expectations, followed by 26 percent who felt the need for appropriate policy measures to end the financial crisis. Whereas, 18 percent of the respondents expected cash subsidy and 15 percent expected the provision of credit for starting/shifting to alternative

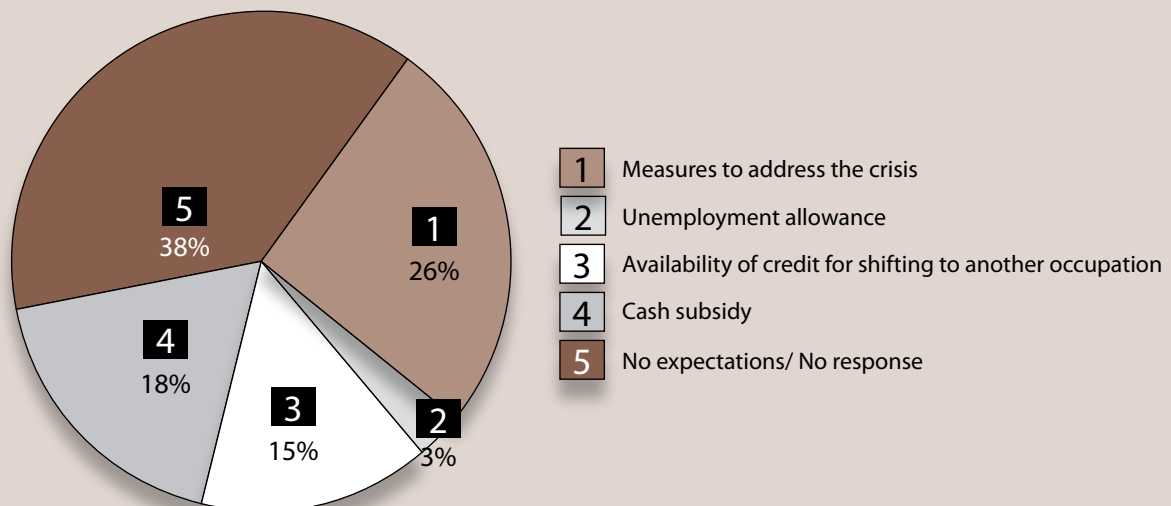


Figure 5 Expectations from the Government

occupations. Only three percent asked for an unemployment allowance (Figure 5). It may however, be noted that the only a sub-set of the sample workers (i.e. 75 out of 120) responded to the question regarding their expectations from the Government or other agencies. Possibly, these questions appeared to be impractical, as the workers in the informal economy were not used to the idea of any statutory mechanisms for social security or protection.

A similar scenario prevailed with respect to expectations from the employers/contractors. A majority of the respondents asserted their demand for continuous work (50); credit facilities (13); and appropriate remuneration (10). As against this, the expectations from their family was mainly in terms of cutting down expenses and moral support, while respondents expected financial help and training from NGOs.

B (i) Profile of the Workers in Coimbatore

Some of the important features that emerged from the survey of workers in Coimbatore are:

- A large proportion (86 percent) of the workers belonged to the OBC category, and nearly three fourths of the workers have nuclear family units. Nearly 31 percent of the workers have been working in the sector for more than nine years, whereas 18 percent have less than three years of work experience in the sector.
- As many as 66 percent of the workers lived in rented houses while 26 percent have their own houses. Most of them lived in semi-*pucca* houses.
- Most of the workers (87 percent) were skilled; only 11 percent were unskilled workers.
- A majority of workers had attained education up to secondary level (VI to X Standard) and only four percent were illiterate.

The workers that form this sample represented the somewhat better-off segment within the sector, since those who have been displaced from the sector/city were not part, of the sample. Nearly 97 percent of the workers reported that they had work for more than nine months, during the 12 month period preceding the survey.

(ii) Impact on Employment and Earnings

About 90 percent of the workers in the sample were regular employees and their employment status has remained more or less the same during the pre and post October 2008 period. Similarly, 87 percent of the sample reported that they were skilled workers. Most of the workers have continued to retain their status as skilled workers in the post October 2008 period.

One third (41 in number) of the workers in the sample, reported that they have been affected due to the economic recession, in the past one year. This proportion is lower (almost half) as compared to the proportion in Rajkot. While the situation

in Coimbatore is relatively better, mainly because of the sustained growth in the electric pump manufacturing industry and due to recent linkages with the Railways and with the Defence sector, the situation is not that encouraging.

DECLINING INCOME IMPACTS EDUCATION

Shanthi works as an operator in an engineering unit but it wasn't always like that. Her husband used to work in an engineering unit for a handsome salary. They had a son and lived happily. After some time, her husband started drinking and became an alcoholic. He was not going to work regularly and he was not giving any money to his family. All the peace in the family disappeared and he often became violent and began to beat Shanthi. He could not keep his job and one day he left home. Shanthi took up a job in an engineering unit, nearby. She earned at least Rs. 3,000 per month and managed to run her home. She put her son in a Government school. A few months ago, she lost her job, as the unit where she worked closed down. Luckily, she has found another job in another unit, where she works now. Her salary has come down to Rs. 2,000 per month, her house rent is Rs. 500 and she finds it hard to meet her expenses. She does some tailoring at home, to supplement her income but she doesn't always have orders. She is finding it hard to keep her son in school.

The adverse effects were faced by all workers, regardless of the number of years of experience in the sector.

Table 3.11 presents details on the adverse effects on employment. This is based on multiple responses obtained from the 41 workers who reported suffering an adverse impact. Whereas 18 workers reported that they had undertaken similar work with different terms of employment, 10 workers reported that they had to travel a longer distance to work than before and seven workers reported having to change their residence in the last six months.

Impact on Earnings and Incomes

What has been the change in income of the workers in the sample during the pre and post October 2008 period? This question was put to all the workers covered by the survey. The responses were somewhat confusing, since most of the respondents could not distinguish between the impact of the recession and the impact of the power cuts, which have been a regular feature for the last one year. Given this caveat, the impact on the incomes of the workers, is presented comparing the two sub-periods viz; April 2008-October 2008 and October 2008-March 2009.

Table 3.12 reveals that 29.3 percent of workers experienced a decline in the total family income, 59.3 percent of workers did not report any change and 11.4 percent of workers earned higher income as compared to the pre-October period (see Figure 6).

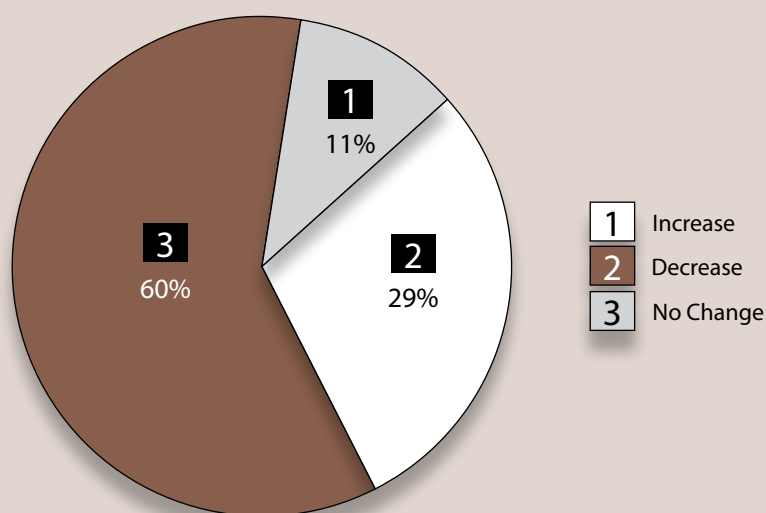


Figure 6 Change in Total Income

Table 3.13 presents the distribution of workers across different income classes. It is observed that just under 30 percent of the workers had incomes of lower than Rs.5,000 per month, whereas the remaining 70 percent of workers earned more than Rs.5,000 per month in the post October period. The situation was found to be quite similar during the pre and post October period, which was marked by a substantial decline in production due to power cuts, as noted earlier.

Similarly, the wage earnings per day have not changed significantly during the two periods, as the sector was already experiencing reduced turnover, owing to the factors discussed above (see Table 3.14).

(iii) Consequences and Coping Mechanisms

Table 3.15 depicts the consequences of the adverse impact on employment among the 41 workers who reported that they had been adversely hit. Reduced food intake, increased domestic conflict and tension and the increased cost of transportation or having to shift to cheaper accommodation were among the major consequences reported by these workers. Two observations deserve special mention in the context of the adverse consequences. First, the impact on food intake has to be seen in the light of the fairly well functioning system of public distribution, covering a number of food items in the state. That the workers had to resort to cutting their food intake is possibly due to the relatively high cost of housing and rent in Coimbatore, as compared to Rajkot.

What seems to have happened is that the burden of reduced income is shifted to food intake, since housing and rent of the work premises is not flexible. The adverse

impact on food is reported to be mainly in terms of reduced consumption of meat/ fish and milk as well as vegetables.

Dis-saving and liquidation of assets were not found to be important consequences, perhaps due to the fact that these workers continue to work in similar jobs and have not undergone any major reduction in income as compared to the earlier period. Only 14.5 percent of the affected workers reported pawning of assets and 3.7 percent reported liquidation of past savings.

The above phenomenon was further confirmed by the fact that almost every one in the sub-set of affected workers was contemplating looking for jobs in the same city as a future coping mechanism, as against going back to the village and/or other city/town in search of jobs (see Figure 7).

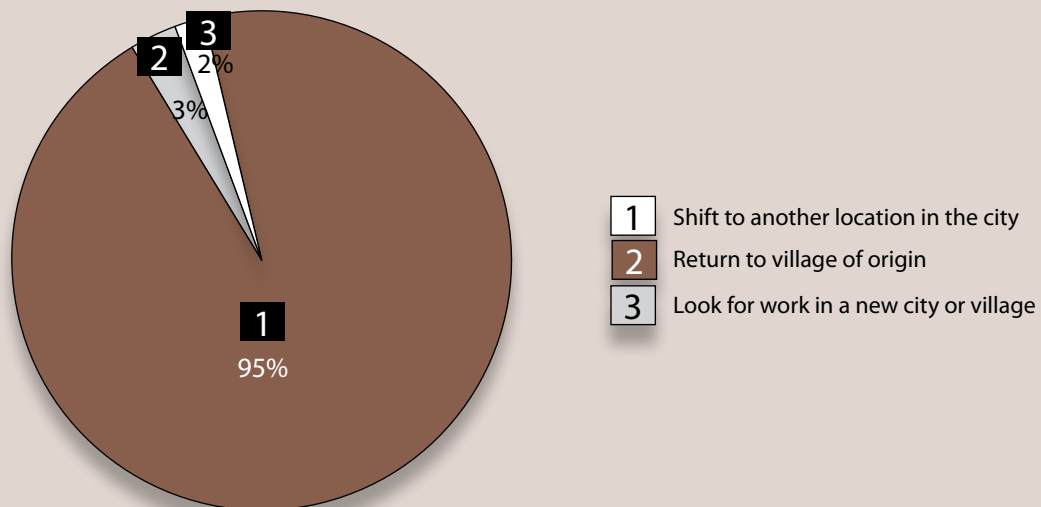


Figure 7 Coping Strategies

The above scenario reinstates the observation made earlier that those who have been severely affected and for a longer period of time have already gone back to their villages, located either within or outside the state; for the remaining workers there is still hope that the city will be able to provide them work, though at lower terms, in the same or in a related sector. The upsurge of the pump industry in the recent past has helped these workers keep up their optimism. It may however, be noted that these are the relatively better-off among the vast labour force, engaged in the engineering sector in Coimbatore.

4. IMPACT ON ENTERPRISES

The above observations from the workers' survey in Rajkot and Coimbatore are further corroborated by the findings from the survey of enterprises. This section recapitulates major observations emerging from the survey as well as from the detailed discussions with informed persons in the sectors, in both locations.

4 (A) Observations from Rajkot

Perceived Impact of the Crisis: Views from Industry Representatives

While, there is broad consensus that the industry has been hit adversely on account of the recent recession in the economy, perceptions vary across different sub sectors and also with respect to the main cause of the slow-down. A rough assessment of the various sub sectors in the engineering and metal-based industries in Rajkot is:

Perceived Impact of the Recession on Different Sub sectors of Engineering/Other Industries in Rajkot	
Sub sector	Impact on Production (% Reduction)
Agro based industry	Nil
Oil Engine/Pumps	Already slowed down due to diversification to Electric Pumps
Foundry/Casting	30%
Auto parts	50%
Forging Plants	50%
Furniture (Metal)	50%
Kitchenware (Metal)	Nil
Imitation Jewellery	Nil
Construction	60-70%

Since exports account for a relatively small proportion of the total production (about 15 to 20 percent) in the engineering sector in Rajkot, entrepreneurs tend to see the recent slow-down as a combined impact of the speculative rise in the prices of oil, coal and pig iron prior to October 2008 and the recession. The recession accentuated the slow-down, just at the time when new orders were being placed, as the prices started falling and the inventories reached rock bottom levels in the early part of 2009.

Several entrepreneurs say that there is in fact no major cut in the demand in the domestic economy. However, there was a sudden burst of the boom that was fuelled by the steep and rapid rise in the income and purchasing power of the few employed in the export-oriented sectors or the multinationals operating in the country since 2003. The boom in the real estate market and auto industry prior to 2008, led some of the units in the engineering industry to go in for significant

expansion in their capacities. What is being ascribed as being the impact of the melt down therefore is the non-sustainability of the substantial expansion of capacity, which was undertaken, and subsequently resulted in massive cuts in job-work and in employment in the informal sector.

Migrant Workers and Seasonal Shortages

Another important issue is the reported shortage of skilled workers, especially in foundry and casting-forging sub sectors. It is estimated that nearly 20 to 30 percent of the workers in the industry are drawn from other states, particularly from UP and Bihar. The proportion of migrant workers is as high as 60 to 70 percent in sub sectors like foundry. Many of these workers had already gone for their annual visit to their home towns, partly due to the slow-down that had already started taking place before October. Their absence is often for as long as five to six months.

This year, those who otherwise return to work after March (i.e. after the Holi festival) do not seem to have come back, which was reported as a labour shortage (in May 2009). It appears that apart from the usual seasonality in the supply of labour from these states, the psychological impact of the information that things are not improving much in the industry may have persuaded many workers to stay on in their home villages/towns. Initiatives like NREGS may be another factor in their decision not to return to their earlier place of work.

Findings from the Survey of Enterprises (Rajkot)

Responses from the survey of 30 enterprises in Rajkot are presented in this report. The sample consisted of tiny units (most units had three workers).

Of the 30 micro enterprises covered under the survey, 97 percent reported that they have been adversely affected by the economic crisis. The specific impact on enterprises is summarized in Table 4.1.

- Piling up of stocks was reported by 83 percent of the respondents and reduced demand was reported by all the respondents. These were the most common issues raised by the owners of enterprises in the sample.
- Limited availability of credit was reported by 67 percent of the enterprises in the sample.
- About 37 percent of the sample units reported reduced prices as the problem.
- Limited credit and high prices were the two factors that led to increased out-sourcing, as reported by 53 percent of the enterprises.
- Loss of income was reported by about 50 percent of the units; this is much less than those who reported reduced demand. A part of the reduced income could have been covered by price adjustments during the period of volatility, but the other channel used to retain the income level was to out-source work to smaller

units at lower cost. This obviously implies pushing the burden of the market squeeze on to the very small producers/job workers.

- Only 13 percent of the enterprises in the sample indicated stopping of production as the problem.

It may however be reiterated that the responses obtained through the survey are somewhat ambiguous because of the focus on the financial crisis in the post-October period. Since the sector was already undergoing a slow-down as well as volatility during the year preceding the crisis, it is difficult for the respondents to clearly separate the impacts of the two factors and distinguish between the causes of the slow-down before and after October 2008. This is what is reflected in Table 4.2. This is not to deny the impact of the squeeze in the export market, resulting mainly from the financial crisis.

The findings emerging from Table 4.2 may be summarized as follows:

- Most of the units plan to continue in the same product line, as shifting out may not be feasible.
- The situation with respect to availability of workers appears to be mixed; several of the enterprises reported that those who have gone to their respective villages outside the state, may not come back till the industry starts recovering; in any case they will not be back before the end of the sowing season.
- A majority of the enterprises reported reduction in production/turnover and sales.
- The situation pertaining to lack of adequate credit and help from the Government was reported to be the same, both before and after the crisis, by most of the respondents.

Overall, it appears that the enterprises also faced severe stresses, just as the workers did; the only difference being that the former may have better capacities to cope with basic livelihood issues, at least in the short run, whereas the latter may not be in the same position. The challenge therefore is to think of protecting the interests of the workers and at the same time salvaging the enterprises that have been facing the double squeeze, over a long period of time.

4 (B) Observations from Coimbatore

Perceived Impact of the Crisis: Views from Industry Representatives

The engineering sector in Coimbatore consists of three segments, namely manufacturing of pumps, auto parts and foundries. The recent crisis has affected these three segments differently. Since the textile sector has been seriously affected, it has led to a huge impact on the textile machinery manufacturers⁶. The industry was

⁶ For example Laxmi Machines Works (LMW) and their ancillary units have been affected.

already facing some problems due to the severe power shortages over the past year; the current export squeeze has made it worse. Similarly, the auto parts segment has been severely affected and the foundry sector has also suffered a major jolt. The power cuts have affected industrial production in the entire state. In fact, erratic power supply is perhaps the most important reason for the slow-down experienced by the entire sector in the last couple of years.

The only sub sector of the engineering industry that has remained unaffected by the recession is pump manufacturing. This is mainly due to good rainfall and the boost received for promoting private investment in agriculture. There are about 600 pump manufacturers in Coimbatore. They outsource their components from the micro units. These units also faced problems, as their jobs were shared by the other units which were affected by the recession.

This leads us to focus on yet another important dimension pertaining to inter-scale competition in the pump manufacturing segment. It appears that the export-boom in the past decade created competitive pressure for quality and/or larger investment that many of the small and tiny units could not withstand. As a result, the relatively larger units, within the pump manufacturing sector, seem to have gained, perhaps at the expense of the small and tiny units. It is, however, not clear as to how the intra-segment competition has played out and what has been the net impact on the small/tiny units, as several of them may have turned into job workers for the growing medium/large scale units.

There is the issue of price fluctuations, faced by the entire sector, that resulted in a situation where the inventories were built up at higher costs (due to significant rise in the prices of crude oil and coal), and were difficult to sell after the sudden fall in the raw material prices, leading to a fall in output prices in the market. One of the important fall-outs of this kind of sudden and steep fluctuation in the prices is the shrinking of market demand, inventories and production, in the wake of the expectations that the prices will decline further. This has resulted in loss of employment in the sector. Moreover, those who continued to be in their jobs, had to accept lower wages, since that was the best mechanism for the producers to 'compensate' for the increased cost of production. This implies that mismanagement on the price front may have had a dampening impact on wages within the sector.

While it is difficult to gauge the intensity of the impact on the engineering sector in the Coimbatore cluster, it appears that the present recession has resulted in about 40 to 50 percent reduction in the total turnover of the sector; a substantial part is due to textile and auto parts related segments, in the sector. The impact is felt particularly by small and tiny enterprises and workers. According to rough estimates, about 10 percent of the small/ tiny units had already closed down and several of them were functioning at between 50 to 70 percent of their capacities. Several units were struggling to survive and all expansion plans have been put on hold. The industry leaders however are hopeful that the downturn will be reversed by the end of 2009.

Migrant Workers and Seasonal Shortages

This situation has led to massive loss of jobs in the sector. Many of the labourers who were brought in from states like Bihar and Orissa, to make up for the shortage of local workers, were looking for alternate jobs in other sectors like construction, etc. Entrepreneurs and self-employed persons were looking for different opportunities. Many units are running with reduced work-load and a few labourers. With about 40 to 50 percent reduction in the turnover during the past year, nearly 15 to 20 percent of the workers seem to have lost jobs, an estimated loss of 50,000 jobs.

A significant part of the workers who lost jobs belonged to UP and Bihar. The first impact of downsizing has been to reduce the working hours from 12 hours to eight hours, per day. The coping mechanism adopted by the workers consists mainly of going back to the villages to find work. At the same time the seasonal shortage of labour also persists, as in Rajkot. Another important strategy is to find work in the construction sector. Lastly, since a part of the industry is linked to large scale public sector units, especially procurement for the Railways, the sector is able to cope with the retention of at least some skilled workers. The situation however, may change if the expected turnaround does not take place.

Findings from the Survey of Enterprises (Coimbatore)

The enterprise survey in Coimbatore covered 40 units. These units consist mainly of small and tiny units, with between two and six workers. Of these, 25 units had three workers and four units had four workers each.

The evidence from Tables 4.3 and 4.4 clearly suggests that the recession has impacted 80 percent of the sample units. The main impact is in terms of reduced demand, which in turn has resulted in reduced income in the enterprises covered by the survey.

Another important factor, reported by half of the sample units related to power cuts, an issue which affects the entire manufacturing sector in the city. In fact, a part of the reported reduction in demand is attributable to power cuts that have caused reduction in production among machine manufacturers and assemblers, who in turn have reduced demand for parts and components sourced from small and tiny units, operating at the tail end of the product chain. This combined with the slump in the export market has impacted a few of the relatively larger units. Therefore, not many units have reported piling up of stock - a phenomenon reported by a large proportion of units in Rajkot. Similarly, the credit crunch is not found to be so acute a problem, since production in any case, has been dampened by the limited supply of power.

Unlike in Rajkot, increase in outsourcing was not found to be so widely prevalent in Coimbatore, during the specified time period. This could be due to the inter-scale

FROM OWNER TO WORKER, DUE TO THE CRISIS

Krishnamoorthy is a lathe operator, but five months ago he was the proud owner of a unit with three lathes. He had established his unit eight years ago. He was getting full job orders from auto ancillary units. Due to the recession, his orders began to come down after October 2008. He could not pay salaries to his workers and also he could not pay the monthly installment to the banks for the loan he had taken for his machines. Now, he has sold all his lathe machines. He has borrowed about Rs.150,000 to pay wages to his workers, rent for the shed and to settle his dues to the bank. At present, he is earning Rs. 5,000 per month. He finds it difficult to pay the monthly installment for the two - wheeler, which he had bought for his unit, one year ago. His father-in-law helps him by giving some money, now and then. He has two daughters and he has put the elder one in a public school, this year. The younger daughter is only one year old. He is hoping his wife can find work, as she is a commerce graduate, but he is not sure that she will find a job. The future looks bleak for him and his family.

competition between relatively larger and the tiny units, where the former may have an edge over the latter, in terms of technology and quality control.

A similar picture emerged when asked about specific changes since October 2008. A large majority of the respondents reported a decline in demand and turnover though the credit situation was reported to be the same.

A majority of the units reported that they received 'no help' from the Government. This is despite the fact that a number of representations have been made by various associations, including that of the small and tiny units in Coimbatore.

One of the important issues that emerged during the discussions was that the crisis has affected the small and tiny units harder than even the workers, as workers had the option to switch to some other activities (such as the construction and transport sectors) whereas the owners of small enterprises were already burdened with loans and borrowings and could not afford to change to other occupations. This has taken a significant toll on the families of those engaged in small enterprises, in terms of children's education and other services. Small and tiny units are also major losers when compared to the medium and large scale units. The competitive pressure seems to have worked against the small/tiny units whereas the medium/large units have more or less retained their turnover, especially in the manufacture of pumps. Similarly, unskilled workers were affected more severely than skilled workers; many skilled workers were retained in the hope of recovery in the near future.

5. MAIN CONCLUSIONS

5(A) Rajkot

The main observations emanating from the survey in the engineering industry in Rajkot are:

- The engineering industry has been affected adversely by the recent economic crisis, since October 2008. The impact however, varies across specific products and the size of the units. Products related directly to auto parts and machinery, have been affected more severely. Similarly, the very small units have been impacted more severely, as compared to the larger units, which, so far, have been able to cope with reduced production. Most of the medium and large units have retained their skilled and regular employees, as they expected recovery to start from July, 2009.
- Frequent volatility in the price of raw materials such as coal, pig iron and crude oil has contributed substantially to the present situation of low demand and turnover. This coupled with seasonal migration of skilled workers and the financial crisis has aggravated the problem.
- More than the closure of units, reduced demand appears to be the major problem faced by the units. Since more than two thirds of the workers covered in the survey are daily wage earners, 82.5 percent of the workers reported an adverse impact of the recession; most of them reported reduced work or less payment for the same (or more work) as being the main impact. Almost all the workers reported loss of income. This has resulted in reduced quantity and quality of food intake. Another important fall out is neglect of health care and increased mental stress. Going back to the original villages and towns that they came from has been reported as the main strategy for coping with the situation. About 75 percent of the workers reported borrowing as an important coping strategy.

CREDIT FROM THE GOVERNMENT CAN HELP

Jitubhai Sakhia is 23 years old and has studied upto Standard X. He is currently unemployed. He has a nine-member family, including his wife and two children. He owns a two-room house. He has been unemployed for the last six months, due to the closure of the unit where he worked. He has used up his savings of Rs.15,000; and the Rs. 30,000 that he borrowed when their second child was born. . He is presently dependent on his father and brothers, who earn Rs. 8,000 per month. His major predicament is that he is a burden on the family; what is more worrying is that he is unable to get any work, despite the fact that he is willing to take up any job. He urges that some credit support from the Government should be made available in the time of crisis. He sees little hope for the future and is suffering from depression. His situation is also causing tension in the family.

5(B) Coimbatore

The main observations emanating from the survey in the engineering industry in Coimbatore are:

- The impact of the recession on the engineering industry in Coimbatore has been mixed. Whereas pump manufacturing, foundry and infrastructure related segments have suffered a relatively small adverse impact; the auto parts, textile machinery parts and construction related segments have been badly affected.
- Of the estimated 200,000 to 300,000 workers in the sector, about 50,000 have lost jobs. Those who had migrated to Coimbatore from other states like Bihar, UP and Orissa have already gone back to their villages. Similarly, most of the unskilled workers who had joined the industry during the recent up-turn, prior to the recession, have also gone back to their villages; most of these unskilled workers come from the surrounding areas. Those that have retained their jobs have had to take a cut in the number of hours of work from 12 to eight hours, per day.
- More than the economic recession, the power cuts that have been a common feature in the state, had already impacted the industry significantly. The impact has been visible for more than a year. As a result, discerning the impact of the financial crisis on total earnings or wage income of the workers during the last six months is difficult. Two thirds of the workers in the sample did not report any direct impact of the recession, except for the reduction in the number of hours of work, each day. This phenomenon had already set in due to power cuts. For those workers who did report a direct impact of the recession, the impact

HOPE FOR THE ENTERPRISING

Jayabal has a precision engineering unit with six turret lathes. All his machines are tailor-made for specific components. As he was getting huge orders for these components, he bought all the machines. He was running his unit 24 hours a day, in three shifts. His unit started facing a problem when the prices of raw materials began to rise and this was compounded by the power cuts which lasted for five to six hours every day. He was facing a lot of difficulty. All of a sudden, the recession set in and the orders started declining. He suffered a huge loss and he has already borrowed Rs. 2.5 lakhs, to keep his unit afloat. His unit is operating at only 20 percent of its capacity. Life has become very difficult for him. He got an offer from a pump set manufacturer, for assembling pump sets. Even though he had little experience in the field, he has taken up this assignment for the time being. He engaged his sons and relatives for this work, especially during their school holidays. He cannot afford to recruit regular workers, as this is a seasonal job and will last only till the monsoon sets in. He is trying to cash in on the seasonal market for pumps and is considering starting his own unit. Others in this sector are not so enterprising.

on food intake, the increased cost of rent and transportation and increase in domestic conflict and tension assumed special importance. Addressing the issues of power cuts and credit facilities were the two most important demands that were made by the owners of enterprises.. Provisioning of educational and other financial support were among the two most immediate needs of the workers engaged in the industry.

Larger Questions: Some Reflections

How far do the limited findings from the field help answer some of the larger questions that were posed at the beginning of the analysis? The following observations may be made:

- First, the financial crisis is more an intensifying factor rather than the major trigger for the slow-down in the engineering sector, in both the locations. The diversified nature of the sector makes it more difficult to segregate the various factors - structural, price and market related, scalar and financial that influence the sector.
- The recent crisis has once again exposed the inherent weaknesses in the labour markets, the truncated flows of technology and credit, and the vulnerability of those that operate at the tail end of a production chain, in this diversified segment of India's manufacturing sector. The scale of operation, thus does matter, in terms of how badly a unit is going to be affected. The vulnerability of the very small and tiny enterprises has been brought to the fore, putting them almost on par with the workers in the informal economy.
- Outsourcing and scalar competition pushes the tail enders to either accept lower margins, which in turn forces them to squeeze wages and/or drives them out of the market. Volatility in input prices and supply further accentuate these processes.
- A large number of households seem to have already cut down food intake and refrained from obtaining medical services. The high rents, especially in Coimbatore, may drive out workers and enterprises that have suffered substantial loss in earnings. Many workers may be forced to go back to the villages, from where they had migrated to the cities. This may imply another round of displacement, at least for some of them.
- While many of the workers have so far refrained from going back to their villages (barring those workers who came from other states) several workers think that this may be the only option, in case things do not improve in the next few months. This may have a further dampening impact on the rural economy and on wages; an issue that needs further examination.
- Both entrepreneurs and workers are optimistic. Many of them felt that like other such crises in the past, this too shall pass. However, a small proportion of workers are suffering from a great deal of stress and have slipped into depression. The

Government must assure the industry, as well as the workers, that it is concerned about their welfare.

- In this context, some policy implications with specific reference to the engineering sector in the country have been suggested in the following section. Some of these do not emanate from the specific findings of the micro studies carried in the two locations but draw upon the discussions with stake holders in both Rajkot and Coimbatore.

6. POLICY IMPLICATIONS

- There is a need to urgently address the issue of stability in prices and supply of raw materials and ensure better power supply, particularly in Coimbatore. This also warrants greater emphasis on technology and productivity aspects, so that the burden of the increased competition is not passed on to the very small and tiny units.
- Flow of credit should be revamped, especially to the small and tiny units, to help them overcome the financial burden created due to the fluctuating prices of raw materials, coupled with the slow-down of demand and increased scalar competition within the industry.
- Another important requirement is the provision of basic infrastructure at reasonable cost, to small and tiny units. This will not only reduce the cost burden on these enterprises, but will also help cleaning up the environment and lead to better management of industrial waste and pollution. Industrial estates, industrial parks and clusters seem to have bypassed the needs of small and tiny units or pavement producers that operate in the sector.
- The need for ensuring support for food, health and education security for workers' families should be seen as an immediate priority. Such an initiative should have already been in place, particularly as the economy has experienced a decade of sustained growth. Industry associations and citizens groups can play a special role in promoting and managing some of these social protection measures, to insulate workers from the vagaries of market fluctuations. Both Rajkot and Coimbatore have had a tradition of industry associations playing a pro-active role in society. These institutions need to be reactivated, in order to be able to cater to the new challenges and reach out to workers and their families.
- Implementation of NREGS and its extension to urban areas is an important suggestion that needs to be examined carefully. Similarly, the promotion of home based production as a livelihood option, needs to be encouraged. Several activities such as the production of food grains on marginal land; homestead cultivation and kitchen gardens; fodder cultivation for livestock rearing and

other activities for environmental regeneration may be taken up on a priority basis. Home based production, with appropriate social protection for workers, may be promoted in areas such as processed foods.

- Finally, a system of registration of enterprises and workers should be in place so as to enable a systematic study of the impact on industry, both positive and negative, emanating due to a variety of factors. At present, there is no systematic data base that can help in providing a number of units, the number of workers employed and the production in major product lines, within the sector.
- There is a need to create a larger platform, where various stake holders can participate, to voice their concerns and find solutions that can help a large segment of affected workers and enterprises, rather than a selected few in the sector, as often happens at present.

APPENDIX

Tables

Table 3.1 Socio-Economic Features of the Workers (Rajkot)					
Indicators	Number of Workers	% of the Total	Indicators	Number of Workers	% of the Total
1. Working in the Industry for			3. Social Groups		
Up to 3 Years	58	48.3	SC /ST	30	25.0
3-9 Years	38	31.6	OBC	62	51.7
>9 Years	24	20.0	Other	28	23.3
All	120	100		120	100
2. Family Type			4. Type of House		
Joint	33	27.5	<i>Kutch</i>	47	39.2
Nuclear	58	48.3	<i>Semi Pucca</i>	42	35.0
Single	29	24.2	<i>Pucca</i>	31	25.8
All	120	100	All	120	100
5. Education			6. Ownership of House		
Illiterate	24	20.0	Own	53	44.2
Up to Primary	23	19.1	Rented	61	50.8
Up to Secondary	52	43.3	Company Provided	6	5.0
Higher Secondary	21	17.6	All	120	100
7. Age (years)			8. Skill Status		
Up to 20	11	9.2	Skilled	78	65.0
20-30	56	46.7	Semi-skilled	37	30.8
31-60	53	44.2	Unskilled	05	4.2
Total	120	100	All	120	100

Source: Sample Survey in Rajkot

Table 3.2 Change in Employment Status (Rajkot)				
Type of Employment	Before October (Number)	%	After October (Number)	%
Regular Employees	24	20	21	17.5
Daily Wage Earners	84	70	82	68.3
Contract Workers	12	10	15	12.5

Unemployed	-		2	1.7
Total	120	100	120	100

Source: Sample Survey in Rajkot

Table 3.3 Employment Related Difficulties (Rajkot)				
Difficulties	Years of Experience			
	<3	3-9	>9	All % *
Number of Years of Work Experience				
Unemployed	2.2	0	9.5	3.0 (3)
Undertook another Job in the Same Field	8.9	6.1	9.5	8.1 (8)
Shifted to Another Sector/work	2.2	6.2	0	3.1 (3)
Skilled to Semi-skilled/ Unskilled Work	4.4	0	0	2.0 (2)
Change in Terms of Employment	38.6	56.2	42.9	45.4 (44)
Longer Distance and Higher Cost of Travel	6.7	9.4	5.0	7.2 (7)
Had to Change Accommodation	4.4	9.1	5.0	6.1 (6)
Other (Including Reduced Earning)	61.4	43.8	55.0	54.2 (52)

Note: Based on multiple responses

* Figures in parenthesis refer to numbers

Source: Sample Survey in Rajkot

Table 3.4 Distribution of Workers across Levels of Household Income: Before and After October 2008 (Rajkot)				
Income Group (Rs./Month)	Number of Workers (Before October 2008)	%	Number of Workers (After October 2008)	%
Up to 1000	-	-	4	3.3
1001-2000	5	4.2	21	17.5
2001-5000	83	69.2	82	68.3
>5000	32	26.7	13	10.8
All	120	100	120	100

Source: Sample Survey in Rajkot

Table 3.5 Average Wage Income (Rajkot)		
Experience in Years	Average Wage Income (Rs/Day)	
	Before	After
<3	168.9	132.4
3-9	179.4	143.6
>9	199.7	141.4
All	179.2	137.7

Source: Sample Survey in Rajkot

Table 3.6 Consequences for the Family (Rajkot)

Impact on	Number of Responses*	%
Children's Education	24	20.0
Food Intake	69	57.5
Payment of House Rent	41	34.2
Remittances sent home/village	37	30.8
Seeking Medical Treatment	49	40.8
Children/Old Persons Pushed into Workforce	5	4.2
Women Pushed to Paid Work	12	10.0
Increase in Domestic Work of Women	18	15.0
Increase in Domestic Conflict/Tension	33	27.5
Decreased Spending on Smoking and Drinking	40	33.3
Instances of Depression/Mental Stress	83	69.2
Transport Cost/Change in Mode of Transport	28	23.3

Source: Sample Survey in Rajkot

*Based on multiple responses

Table 3.7 Indebtedness by Years of Experience (% of workers) (Rajkot)

Number of Years of Experience	Liquidation of Savings	Pawning	Selling	Borrowing
<3	50.0	5.2	7.0	37.8
3-9	60.5	21.1	7.9	10.5
>9	45.8	8.3	-	45.9
All	52.8	10.8	5.9	30.5

Source: Sample Survey in Rajkot

Table 3.8 Coping Strategies (Rajkot)

Strategies	Number of Responses*
Back to Family Occupation	11
Move to a New City/town	28
Move to another Sector	37
Commit Suicide	03
Back to Village of Origin	45
Faced No Difficulty	03
Economizing on Household Expenses	08
Nothing/no Strategy	03

Source: Sample Survey in Rajkot

*Based on multiple responses

Table 3.9 Expectations from Government (Rajkot)		
Expectation	Number of Respondents	%
Measures to Address the Crisis	31	25.83
Unemployment Allowance	04	3.33
Availability of Credit for Shifting to another Occupation	18	15.0
Cash Subsidy	22	18.33
No Expectations/ No Response	45	37.5
Total	120	100

Source: Sample Survey in Rajkot

Table 3.10 Socio-Economic Features of the Workers (Coimbatore)					
Indicators	Number of Workers	% of the Total	Indicators	Number of Workers	% of the Total
1. Working in the Industry for			3. Social Groups		
Up to 3 Years	22	17.9	SC /ST	11	8.9
3-9 Years	63	51.2	OBC	106	86.2
>9 Years	38	30.9	Other	06	4.9
All	123	100		123	100
2. Family Type			4. Type of House		
Joint	16	13.0	<i>Kutcha</i>	02	1.6
Nuclear	94	76.4	<i>Semi Pucca</i>	87	70.7
Alone	13	10.6	<i>Pucca</i>	34	27.7
All	123	100	All	123	100
5. Education			6. Ownership of House		
Illiterate	5	4.1	Own	32	26.0
Up to Primary	13	10.6	Rented	81	65.9
Up to Secondary	88	71.5	Company Provided	10	8.1
Higher Secondary	7	5.7	All	123	100
7. Age (years)			8. Skill Status		
Up to 25	48	39.1	Skilled	107	87.0
25-35	45	36.6	Semi-skilled	02	1.6
35-60	30	24.3	Unskilled	14	11.4
All	123	100	All	123	100

Source: Sample Survey in Coimbatore

Table 3.11 Employment Related Difficulties (Coimbatore)

Difficulties	Experience (Years)			
	<3	3-9	>9	All (Number)
Unemployed at Present	02	-	-	02
Undertook Similar Work with Changed Terms	07	06	05	18
Shifted to another Sector/work	-	01	-	01
Shifted from Skilled/semiskilled to Unskilled	-	-	-	-
Change in Employment Status	01	-	-	01
Longer Distance and Higher Cost of Travel	06	02	02	10
Had to Change Accommodation	03	03	01	07
Any Other	05	04	10	19

Source: Sample Survey in Coimbatore

* Based on multiple responses

Table 3.12 Change in Total Income(Coimbatore)

Number of Years of Experience	Number	Change in Income (% of HHs)			
		Increase	No Change	Decrease	All
<3	34	14.7	47.1	38.2	100
3 – 9	53	11.3	60.4	28.3	100
>9	36	8.3	69.4	22.2	100
Total	123	11.4	59.3	29.3	100

Source: Sample Survey in Coimbatore

Table 3.13 Distribution of Workers across Levels of Household Income: Before and After October 2008 (Coimbatore)

Income Groups	Number Of Workers (Before October 2008)	%	Number of Workers (After October 2008)	%
Up to 2000	02	1.6	0	0
2001-5000	38	30.9	35	28.5
>5000	83	67.5	86	69.9
Total	123	100	123	100

Source: Sample Survey in Coimbatore

Table 3.14 Average Wage Income (Coimbatore)

Number of Years of Experience	Wage Income (Rs./ Day)	
	Before*	After*
<3	127.8 (33)	124.9 (34)
3-9	146.5 (53)	146.3 (53)
>9	189.0 (36)	182.6 (36)
Total	154.0 (122)	151.0 (123)

Source: Sample Survey in Coimbatore

* Figures in parenthesis refer to numbers

Table 3.15 Consequences at the Household Level (Coimbatore)

Adverse Impact on	Number	%
Children's Education	03	7.3
Change in Food Intake	11	26.8
Payment of House Rent	3	7.3
Remittance Sent Home/village	1	2.4
Medical Treatment	3	7.3
Women Pushed to Paid Work	2	4.9
Increase in Domestic Conflict/Tension	5	12.2
Increase in Spending on Smoking and Drinking	2	4.9
Depression	4	9.8
Increased cost of Transport for Work	4	9.8

Source: Sample Survey in Coimbatore

*Based on multiple responses

Table 4.1 Impact on Micro-enterprises in Rajkot

Details	% of Enterprises
Stock Piled Up	83.3
Difficulty in Availability of Credit	66.7
Reduced Demand	100.0
Reduction in Price	36.7
Increase in Outsourcing	53.3
Decline in Income	50.0
Stopping Production	13.3

Source: Sample Survey of Enterprises in Rajkot

Table 4.2 The Situation in Rajkot (Pre and Post October 2008)

Details (Number of Units)	Improved/ Increased	Deteriorated/ Decreased	Unchanged
No. of Products Produced	-	3	27
Availability of Raw Material	-	15	15
Skilled/ Semi Skilled Workers	-	12	18
Unskilled Workers	-	12	16
Availability of Credit	-	4	26
Orders for Production	1	27	2
Turnover	-	26	4
Volume of Sales		21	5
Employment (family)	11	4	15
Status of Help Received from the Govt.	-	-	No Help-25

Source: Sample Survey of Enterprises in Rajkot

Details	% of firms
Stock Piled Up	17.5
Difficulty in Availability of Credit	22.5
Reduced Demand	80.0
Reduction in Price	30.0
Increase in Outsourcing	5.0
Decline in Income	80.0
Closed down	2.5
Other (mainly power cuts)	50.0

Source: Sample Survey of Enterprises in Coimbatore

Details (Number of Units)	Improved/ Increased	Deteriorated/ Decreased	Unchanged
No. of Products Produced	02	13	25
Availability of Raw Material	12	04	23
Skilled/ Semi Skilled Workers	2	25	13
Unskilled Workers	–	11	27
Availability of Credit	02	08	30
Orders for Production	04	32	04
Turnover	04	28	07
Volume of Sales	05	30	04
Employment (family)	–	01	39
Status of Help Received from the Govt.	–	–	39

Source: Sample Survey of Enterprises in Coimbatore

References

- Morris, S (2006), *Infrastructure Development and Strategies for Gujarat*, (unpublished), paper prepared for the Gujarat Development Report, Gujarat Institute of Development Studies, Ahmedabad.
- Awasthi, D (1997), '*The Diesel Engine Industry cluster – Rajkot*', in D. Awasthi (ed.) *Dynamics of Industrial Cluster in India*, Entrepreneurship Development Institute of India, Ahmedabad.
- Basant, R (1997), in D. Awasthi (ed.), *Op.cit.*
- Kashyap, S. P. and A. Shah (1995), '*Induced Industrial Clustering and Efficiency: An Exploratory Study of Gujarat's Industrial Estates*', *The Journal of Entrepreneurship*, 4 (1).
- Shah, A (1994), '*Inter-firm Scalar Linkage in India: A Class Within the Small Scale Industry*', *Small Business Economics*, (6), Springer, Netherlands.
- T.S. Subramanian, *Against all odds: Challenged by the global financial crisis and a crippling power cut, entrepreneurs are keen to develop their capability*. *Frontline*, Volume 26 - Issue 06 :: Mar. 14-27, 2009, Available at: <http://www.hinduonnet.com/fline/fl2606/stories/20090327260610700.htm>.
- Gol, 2009, *Economic Survey: 2008-09*, Government of India, Oxford University Press, New Delhi.
- Gol, 2004, *Final results: Third All India Census of Small Scale Industries (2001-2002)*, Development Commissioner (SSI), Ministry of Small Scale Industries, Government of India, New Delhi.
- CMIE, 2009, *Monthly Review of the Indian Economy*, Centre for Monitoring the Indian Economy, Mumbai.



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Nuts and bolts - Manufacturing in a slump Tail Enders in the Recent Recession – A case study of the Engineering Sector in Rajkot and Coimbatore

The Indian engineering industry is characterized by wide-ranging products and has a spatially diversified nature. The sector is relatively less fragmented at the top, as the competencies required are high, while it is highly fragmented at the lower end. A large part of the industry is located in the informal economy that operates at the tail end of the production chain.

The performance of the engineering sector, in the recent recessionary period, has been fairly varied, across the various sub sectors or industries. The global financial crisis and the resulting decline in exports and foreign investment has adversely affected the sector, particularly the workers and small enterprises.

This study examines the impact of the economic slow-down on workers and on enterprises, in two major engineering clusters in the country – in Rajkot and Coimbatore. It also provides policy prescriptions and practical suggestions to help deal with similar challenges in the future.

This paper is part of a series of three studies undertaken with support from UNDP, to examine the impact of the global economic crisis on the poor. The papers in the series have been edited by Nandini Oberoi.

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United Nations Development Programme

55, Lodi Estate, P.O. Box 3059

New Delhi 110003, India

Tel: (91 11) 4653 2333 / Fax: (91 11) 2462 7612

Email: info.in@undp.org

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