VIDYASAGAR UNIVERSITY JOURNAL OF ECONOMICS

Vol. XII 2007

CONTENTS

The Development of Development Economics and Its Objectives

Hiron Kumar Banerjee*

Development Economics was born as a separate sub-dicipline of Economics in the immediate post-Second World War period with a view to prescribing appropriate policies for developing countries to catch up with the advanced countries within a reasonable period of time. The paper discussess how development economics develops over years and in which ways it is distinct from neo-classical economics and what are its objectives.

The Second World War marks a watershed in the history of economic thought. It was preceded by the 'Keynesian revolution' and was succeeded by the birth of Development Economics as a separate branch of Economics. The latter perhaps got encouragement from the prior success of the former and both marked clear departures from the classical and neoclassical traditions.

Towards the end of the War in July 1944 the International Bank for Reconstruction and Development (IBRD) later known as the World Bank was established from the UN Monetary and Financial Conference at Bretton Woods, New Hampshere in the USA. It began operations in June 1946. The Purpose of the Bank was to encourage capital investment for the reconstruction and development of its member countries either by channelling the necessary private funds or by making loans from its own resources. The reconstruction of war devastated European Countries was well taken care of by the Marshall Aid programme, named after the then US Secretary of State, General G.C. Marshall. But the other task, namely the development of underdeveloped countries remained. The very establishment of this institution established the fact that the development of underdeveloped countries needs separate attention and special type of policy prescriptions. The Bank now operates through two other institutions affiliated to it : (1) The International Finance Corporation (IFC) created in 1956 and (2) The International Development Association (IDA) established in 1960.

In the immediate post-World War II period the world was broadly divided into two sets of countries— one set facing the problem of (productive) capacity utilization and the other set facing the problem of capacity creation. The then high income advanced capitalist countries comprised the first set and the low income retarded economies comprised the second. The problems of general excess capacity and consequent unemployment afflicting the rich countries since the early 1930s was supposed to be well tackled by the Keynesian economics that was born in 1936. But the objective conditions in the poor, labour surplus countries of the world and the problems confronting them in the path of faster rate of growth were so different in nature from those in the advanced capitalist countries as to require a completely different type of theorizing. Keynesian economics was not geared to handle the problems of more productive utilization of underemployed manpower in the countryside and creation of additional

*Former Pro-Vice-Chancellor (Finance) and Professor of Economics, University of Calcutta.

and disguised investment potential have occurred again and again in different forms in the writings of others including Arthur Lewis (1945)

Departing clearly from the earlier neo-classical economic teachings, both Keynesian and Development economics focused on the need for an economically active state and deliberate public action to pull the economy out of the then existing low level of economic activity (for different reasons though). This did not necessarily mean direct participation by the state in trade and manufacturing activities even in the context of a late developing country. Albert Hirschman's Unbalanced Growth strategy, for example, fostered an essentially 'anti-planning' mode of thinking where the role of the state would be confined simply to the creation of stresses and strains in the economy so as to activate the latent forces of production within the economy. Hirschman's thesis of 'deliberate disequilibria' was, doubtless, a *stunning blow* to the neo-classically inclined economist who believed in smooth, continuous processes and tendencies towards equilibrium. But in so far as it implied the existence of enough hidden resources (including entrepreneurship) within the economy waiting to be tapped, a Hirschman type economy may be said to differ from a Keynesian type only in degree or time sequence and hence there is a sort of similarity in the role of the State, in general, envisaged by them.

At one stage, the debate on the issue of market failure originally discussed by Pigou in his Economics of Welfare (1932) assumed importance through the writing of Rodan (1943) and Scitovsky (1954). They were greatly critical of the market mechanism and provided a reinterpretation of the concept of externalities. Neo-classical economics was based on the notion of optimality of competitive equilibrium. But if markets do not exist in sufficient numbers or tend to be monopolistic or oligopolistic, a different approach is called for.

The first Un report (1951) prepared by D.R. Gdgil among others can be considered a watershed in the initial formation of development economics. This report actually gave the hope for the first time that the living standards of the people in economically backward countries could be raised through deliberate policies of state action. In this connecition one can also refer to Kalecki's contribution to the rise of Development Economics. While writing a review of a book by a Rumaninan economist, Kalecki emphasised on two very important themes which have played major roles in the subsequent discussion on development economics that took place in the 1950s and 1960s. Kalecki pointed out that exclusive reliance on protectionist industrialisation as the principal solution to the problems of economic backwardness could not be sustained. He referred in this context to the need for land reforms to overcome the institutional barrier posed by the traditional agrarian structure. He had also referred to the role of disguised unemployment and the surplus embodied in it (Kalecki 1938).

The days of euphoria have long gone by. The Keynesian remedies have proved to be costly in some cases and not free from side effects. Similarly, the enthusiastic early development economists seems to have turned skeptical by the end of 1970s. Even earlier, a group of ecomomists belonging to what is known as the 'Dependency School' had expressed grave doubts, on the basis of existing international rich-poor relations, as to the prospects of late developing countries moving fast, if at all, along capitalist paths of development. Paul Baran (1957) is said to be the father of this approach. Andre Gunder Frank (1967) is another prominent author in this line.

A group of economists firmly believes even today that underdevelopment, like development, is the outcome of a process. Actual historical change cannot be explained without bringing in conflicts between capitalists and workers, capitalists and landlords, capitalists of the ruling country and those of the ruled country, and so on. Thus instead of a world of smooth processes, tendencies toward equilibrium and harmony of interests, these economists focus on conflicts, disequilibria and recurring breaks in the process of development. In their view neither sophisticated neo-classical tools based on marginal calculus, nor the classical analytical devices can explain the process of underdevelopment or serve as a guide to policy making for the development of underdeveloped countries. For one thing, neoclassical economics is completely ahistorical in nature. Originating, as it did, in the later half of the 19th century, the neoclassical economists managed to keep social classes away from their universe of discourse. When after the Second World War, economists turned their attention to problems of economic development, the majority of them refused to see existing societies as divided into classes and driven by their conflicts.

The perception of development in third world coutries was largely dominated by Rostow's doctrine until it was partly superseded by the dependency theories of international economic relations in the early 1970s. According to Rostow, development is a linear path along which all countries are now following them. But the fact is that the poor countries are now confronting altogether different kinds of problems. Moreover some problems similar in kind to those of the past are now expressed in different degrees of intensity and complexity. Especially significant is the fact that the poor cuntries now stand in a different relationship to the rich countries than was true when the presently rich countries (or 'now developed countries' to use Kuznets' language) were poor. These differences are extremely important and they deserve more attention than Rostow gives them.

Over the decades of 1950s and 1960s a number of models and theories were developed to take into account the various asymmetries and rigidities that are found to exist between the traditional and the incipient (and growing) modern sector. These are known as Dual Economy Models (e.g. Lewis model Fei-Ranis Model, Jorgenson Model etc.) which replaced the Harrod-Domar and Uzwa type growth models which completely neglected the agricultural sector (so important in the late developing countries). The Dual Economy models were especially designed to incorporate organizational asymmetries and wage gap between the two sectors, they were also designed to take into account the fact that in the initial stages of development of a labour surplus economy, the labour participation rate can increase faster than the rate of growth of population.

The early development theories and models completely neglected the effective demand problems for the growing non-farm sector in the late developing countries by assuming that saving and investment decisions are identical. But savings in these countries are often found to take place in forms that do not always lead to the creation of additional productive capacity. Over the last two decades of the 20th century, a group of economists had been building up models and theories where a clear distinction was made between the propensity to save and the propensity to invest, thus allowing for underutilization of capacity in the manufacturing sector resulting from deficiency in demand.

The controversy surrounding the wisdom (and hence usefulness) of the teachings of Development Economics in the current national and international perspective goes on. A group of development economists today seem to prefer an imperfectly functioning price/market system to an imperfectly

functioning planning system. Indeed there has been a revival of non-classical economics in the fields of both Keynesian economics and development economics – a renewed trust on the working of market mechanism to bring forth the desired results.

The high growth rates of countries like South Korea, Taiwan, Hong Kong and Singapore relying on market mechanism and the low growth rates of many others in the third world relying on large scale government intervention and involvement in economic activities have given a fillip to the neo-classical resurgence. It has also been pointed out that in an underdeveloped country, enterprise is the real bottleneck and not capital so that too much emphasis on capital accumulation was wrong. It should be remembered, however, that development economics was born at a time when government involvement in deliberately fostering economic growth and industrialization was very rare and the typical rates of capital accumulation were very low. Hence one cannot deny the wisdom of the strategies the suggested. That situation has changed now so that emphasis may be placed on other aspects.

In an essay entitled "the Rise and Decline of Development Economics" published in 1981 Albert Hirschman had almost rung the death knell of Development Economics. He expressed his discontent by saying that Development Economics had achieved its considerable attraction and excitement through the implicit idea that it could kill the dreagon of backwardness (and poverty). But this has not happened. A.K. Sen, however, refuses to admit that Development Economics has lost its relevance altogether. In an article entitled 'Development : which Way Now' published in 1982, he says : traditional development economics has not been particularly unsuccessful in identifying the factors that could lead to faster economic growth in the developing countries. In the field of causation of growth, there is much life left in traditional analyses. But traditional development economics has been less successful in characterizing economic development which involves exansion of people's capabilities. For this, economic growth is only a means and often not a very efficient means either.

II

In the initial years of planning the primary objective had been a faster growth of national output mainly through expansion and diversification of the secondary sector. Professor Amartya Sen in his monograph with Jean Dreze entitled "India : Economic Development and Social Opportunity", writes in the beginning of Chapter Two :

"When the subject of Development Economics emerged as a distinct field of study shortly after the Second World War, it appeared to be something of a bastard child of growth Economics. Some influence other than growth Economics was clearly involved in the origin of development Economics, but it was not altogether clear what form this influence had taken. In one respect at least, the offspring did not differ from what could be expected from a genuine 'son of growth economics', namely an overarching preoccupation with the growth of real income per head".

No distinction was made in the early years of planning between growth and development. It was widely held that if the size of the national cake grows bigger, then every body would benefit; the benefits of growth would percolate across income groups down to the lowest stratum. In the early 1960s Pitambar Pant, the great Indian Planner, propagated the phrase, 'the strategy of rapid growth' sustained by internal savings and suplemented by foreign aid, and this was thought to porvide the central thrust of the assault

on poverty. By providing gainful employment we could provide incomes and put more people above the poverty line. This is the well-known pull-up strategy or trickle-down strategy for attacking poverty. But this policy needed to be combined with effective and comprehensive land reforms as well as with increasing level of public distribution of social consumption such as clean water, sanitation, health services and education. In the case of India, however, government expenditure in the said social sectors fell far short of expectations and the progress of land reforms for the country as a whole was very slow, to say the least, for the first three decades of planning.

One of the important lessons learnt from the first two decades of planning exercise was that the trickle -down effect did not work Instead "the rich got richer and the poor got children"as Kindleberger aptly puts it. Growing unemployment and increasing inequality in the distribution of national and global income and wealth became matters of grave concern all over the world so much so that the UN General Assembly had declared the decade of 1970s as the 'Employment And Income Distribution Decade'. Growth was considered to be no more than an instrumental variable— a means to the end of providing a minimum income to all.

Around this time, A.K. Sen came out with his theory of Entitlements and Capabilities. Sen thinks that economic development is far better characterized by focusing on entitlements of a person, i.e., the alternative commodity bundles that he or she can command. The entitlements generate certain capabilities — the ability to achieve certiain objectives. Sen pointed out that ultimately the process of economic development has to be concerned with the capabilities of the people — what peopele can do and what they cannot do e.g. whether they can live long, enjoy better health care facilities, can impart good education to their children, can live in peace and with dignity free from social and political harassment and tension etc. Some of these are public goods which cannot be bought with income, but this does not entitle him to education or medical treatment if there are no schools or hospitals in the vicinity.

The emphasis on human aspirations and human development as important asects of development policy is also a part and parcel of another new concept which is recently being heard everywhere, viz., Sustainable Development (or Sustainable Human Development as it is often called). It implies fulfilling the needs of the present without limiting the potential for meeting the needs of the future generations. If development is to widen the range of people's choices, it must do so not only for the present generation but also for the future generations. One of the greatest threats to sustainable development comes from poverty and resulting environmental pollution. A second threat comes from the exhaustion of resources, and a third from the health hazards due to malnutrition, overwork and pollution of air and water by modern factories.

The concept of Sustainable Development is more comprehensive and borad-based than the concept of Entitlements and Capabilities developed by Sen. The former is more concerned with the costs inflicted upon the ill-nourished majority of the present World population (and upon the future generations all over the world) by the present day energy-intensive pattern of production and consumption. The latter, however, seems to be more concerned with the provision of certain important public goods and services for all sections of the population and in all parts of the country. There is also an implicit concern about the health hazards created by pollution and insufficient medical care facilities for the poorer sections of the population.

To conclude, what is important is the pattern and type of growth and not simply the quantum or rate of growth. Too fast a growth rate may be detrimental to environment, ecology and social atmosphere. It is also likely to damage the future growth prospects. Income should be measured net of depreciation of capital, both physical capital and human capital, as well as stock of natural resources.

References :

Bhagwati, J.N. (1984) : 'Development Economics -What Have We Learnt', *Asian Development Review,* Vol. 2 No. 1.

....., *Wealth and Poverty,* Vol 1, OUP.

Baran, P.A. (1957) : *Political Economy of Growth,* Monthly Review Press

Bagchi, A.K. (1982) : *The Pplitical Economy of Underdevelopment,* CUP

Chakraborty, S : 'Development of Development Thinking', *Artha Vijnan,* June 1988

Dreze, J & Sen, A.K. (1995) : *India : Economic Development and Social Opportunity,* OUP.

Dixit, A : 'Models of Dual Economies' in Mirrlees & Stern (edited) : *Models of Economic Growth*

Eatwell et al : *Development Economies,'* (Article by Kanbur, R & Mc-Intosh, J)

Fei, J.C.H & Ranis, G (1964) : *Development of the Labour Surplus Economy : Theory and Practice;* Homewood, Ill : Irwin.

Gillis, M, Perkins, D.H, Roemer, M & Snodgrass, D.R. (1996) : *Economics of Development* (Fourth Edition), W. W. Norton & Co.

Hirschman, A (1958) : *The Strategy of Economic Development,* Yale University Press.

..... (1981) : The *Rise and Decline of Development Economics in the Economics of Trespassing,* CUP.

Kuznets : *Economic Growth And Structure.*

Kindleberger & Herrick, B (1977) : *Economic Development,* Mc. Grow Hill Kogakusha Ltd.

Lewis W.A. (1954) : *Economic Development with Unlimited Supplies of Labour,* Manchester School, 22(2)

..... (1955) : *The Theory of Economic Growth,* Allen & Unwin

..... (1984) : 'The State of Development Theory', *AER,* Vol. 74, No. 1

Myint, H (1973) : *The Economics of The Developing Countries,* 4th Edition, B,I. Publications.

Nurkse, Ragnar (1953) : *Problems of Capital Formation In Underdeveloped Countries :* Oxford, Basil Black Well.

Pigou, A.C. (1932) : *The Economics of Welfare,* London.

Rosenstein - Rodan, P.N. (1943) : 'Problems of Industrialization of Eastern And South Eastern Europe', *ET.*

..... (1951) : 'Notes On the Theory of The 'Big Push', in Economic Development For Latin America, Edited by Ellis, H.S., London.

Rakshit, M (1989) : *Studies In The Macroeconomics of Developing Countries,* OUP

Rostow, W. W. (1960) : *The Stages of Economic Growth*

Scitovsky, T (1954) : 'The Concepts of External Economies', *JPE,* vol. 62, No. I

Sen, A.K. (1983) : 'Development : Which Way Now'? *EJ*

..... (1985). *Commodities And Capabilities,* North-Holland.

Santos, T. D. (1970) : 'The Structure of Dependency' *AER,* May.

Zuvekas, G (1979) : *Economic Development,* Macmillan.

Yotopoulos. P.A. & Nugent, J.B. (1976) : *Economics of Development*, Harper International Edition, Harper & Row (CUP).

Globalisation and the Third World: An Opportunity or a Challenge[£]

M. L. Pandit*

While the industrial revolution opened the flood gates of self-sustained economic growth and prosperity in the second half of the eighteenth century, bulk of the mankind to date is struggling to overcome millennia of subsistence living and economic stagnation. Why? An overview of the literature on modern economic growth reveals a strong correlation between this growth and, globalization and liberalization. Almost all the advanced countries of today are witness to this relationship. The importance of this relationship has been reinforced further by the newly industrializing and emerging economies. Their economic growth accelerated only after experimenting with economic reforms and opening up their economies to global trade and investment. Adoption of this strategy by the erstwhile socialist group of countries as well reinforces further the importance of the strong relationship between faster economic growth, and globalization and liberalization. Since varied developments in transport, communication and technology have combined to flatten the global playing field the third world today stands a good chance to transform itself economically through the time tested strategies of liberalization and globalization.

The world economy prior to the industrial revolution was, more or less, a subsistence and homogeneous economy. There had virtually been no significant changes in productivity and standards of living over thousands of years prior to the revolution. Differences in these indicators, if any, across continents and regions within them, reflected essentially variations in natural endowments and their fertility, rather than the levels of development and technologies in use. As per the estimates of Maddison, a leading historian, global living standards did not record any discernible rise during the first millennium. During the next eight centuries these standards, perhaps, went up by above 50 per cent from a small base indeed.[1]Only a small class of people, comprising the rulers, their courtiers and the like, enjoyed the privilege of high standards of living and incomes. Incidentally, most of our current heritage of art, architecture, philosophy and literature dates back to this very period and is indicative of their preferences as well as capabilities of the people of different civilizations and ages.

The economic situation of today's advanced world had hardly been different from rest of the world. This state of affairs is aptly summed up by Lord Keynes in the following words:

" From the earliest times of which we have record- back, say, to two thousand years before Christ- down

---

[£] Revised version of the paper presented at the National Seminar on Globalisation held at Lovely Institute of Management, Jallandhar, Punjab, India, on May 28, 2005.The paper has not been submitted for publication anywhere so far.

* Professor (Economics), Birla Institute of Management Technology (BIMTECH), 5, Knowledge Park II, Greater Noida, U.P, India. Email ml.pandit@bimtech.ac.in

to the beginning of the eighteenth century, there was no very great change in the standards of living of the average man living in the civilized centres of the earth. Ups and downs certainly." (Keynes ,1931).

Even the agricultural productivity up to 1700 AD throughout Europe had remained unchanged from ancient Greek times[2]. In fact some parts of today's third world were economically better off than the so called civilized world. "In the 17th century, China and India accounted for more than half the world's economic output. After a modest interlude, the pendulum is swinging back to them at a speed the West has not grasped." (Cohen, 2008). The following passage is indicative enough of the shape of the world economy a few centuries earlier:

"A few centuries ago, vast divides in wealth and poverty around the world did not exit. China, India, Europe, and Japan all had similar income levels at the time of European discoveries of the sea routes to Asia, Africa and the Americas. Marco Polo marveled at the sumptuous wonders of China, not at its poverty. Cortes and his conquistadores expressed astonishment at the riches of Tenochtitlan, the capital of the Aztecs. The early Portuguese explorers were impressed with the well-ordered towns of West Africa" (Sachs, 2005).

Why did the world economy not witness significant improvements for thousands of years before the industrial revolution? Lord Keynes while analyzing the causes of this slow economic change, rather stagnation, preceding the eighteenth century, attributes it to 'the remarkable absence of important technical improvements' and 'the failure of capital to accumulate." Although the sixteenth and the seventeenth centuries had made notable progress in scientific thought and experiment, it could take the shape of industrial inventions and innovations during the industrial revolution period only. The long stagnation referred to above came to be dismantled selectively, of course, by the industrial revolution beginning in the second half of the eighteenth century in England. It effectively tackled both the constraints responsible for the long and global stagnation. The revolution was the outcome of an unprecedented period of inventions and innovations accompanied by the ever increasing ability of capital to accumulate and be productively reinvested. The revolution enabled England to achieve in half a century what had eluded mankind for thousands of preceding years. By 1831 England was fully transformed into a modernized economy.

"About 1760 a wave of gadgets swept over England.... It was not only gadgets, however, but innovations of various kinds— in agriculture, transport, manufacture, trade, and finance – that surged up with the suddenness for which it is difficult to find parallel for any other time and place". (Ashton, 1972)

These innovations replaced old systems of production and distribution in a matter of decades. It virtually made a total break with the long and unchanged past. This is what made the industrial revolution the greatest event in the economic history of mankind. The transformation was so complete that the systems and techniques evolved over millennia preceding the revolution were virtually rendered obsolete in half a century. The revolution arrived in the United State and Germany a century latter and in Canada, Japan, and erstwhile Russia in the twentieth century. It continues to extend selectively as and when conditions become favourable for its extension. The revolution is, therefore, rightly viewed as a movement and not a period of time. This feature of the revolution, at least, kindles the hope that the world economy

would once again become homogeneous as a developed entity thus bringing high standards of living and prosperity within the reach of all nations and people.[3]

Since the revolution was neither global nor simultaneous, it led to the division of the previously homogeneous and subsistence world economy into the industrialized and advanced and the non-industrialized and backward categories. What is worst is the fact that the later category, now commonly referred to as the third world, encompasses over two-thirds of the mankind. As the revolution has turned out to be a movement, the third world urge to undergo it has been reinforcing itself with the growing awareness and exposure to high standards of living and comfort of the developed world. This reinforcement has gained further strength after the emergence of sovereign, especially democratic, governments in most third world countries.

How can the division of nations between the developed and the developing categories be erased? Or how best can the third world transform itself into the industrialized and the advanced status in near future? Or, why did the revolution not extend to the third world even over two centuries after its inception? These questions, as expected, have attracted wide attention and analyses over the years. The outcome is a vast body of literature on the subject. The dominant view is that the third world would have to follow the path traced by the advanced capitalist world. This path, among other things, makes globalization and competition as essential ingredients of the development strategy. Critics of this time tested strategy apprehend that globalization might benefit the advanced world more than the third world on account of early start and technological and trading supremacy. This is why globalization has come to be viewed as a threat as well as an opportunity. What is the reality?

While failure of the third world to industrialize along with the advanced world can be attributed, among other things, to foreign rule and interference, there are hardly any plausible excuses to justify the continuity of its economic backwardness and poverty half a century after the end of this rule. This is particularly true of countries where plans and programmes for the purpose were put in place soon after independence. Disadvantages arising on account of late start may provide some explanation for slow economic growth but the very success of some of the third world countries in transforming their economies in recent years weakens the strength of this excuse. In fact late start has spared the third world the onerous task of shaping systems and techniques for this great transition and brought even a faster transition within their reach.

Moreover, while the industrial revolution initially placed the pioneers in a decisive advantage, it subsequently facilitated the prospects of geographical dispersal of industry as well. For instance, developments in transport and communication associated with the revolution reduced significantly the costs of overcoming distance. These developments ultimately freed bulk of the manufacturing industries from their previous close orientation to sources of raw materials and markets of the finished products. This shift has been further reinforced by similar developments in the sources of energy. It is no longer necessary to locate an industry in the close proximity of coal mines or water sources. Thermal and hydro power is now transferable over long distances without much inconvenience and cost. Changes in industrial materials, especially from the organic to inorganic ones have, likewise, helped in reducing further the transport orientation of most manufacturing industries. Besides, improvements in the quality of products have also reduced the material requirements per unit of output and thereby further reducing the

importance of transport costs. All these developments have essentially been the outcomes of the industrial revolution and to the great advantage of the third world countries of today[4]. These developments have been further reinforced by recent developments in communications and connectivity[5]. These developments put together had significantly contributed in leveling the global economic play field and thereby enhanced the prospects of economic growth in the third world as well.

The emergence of the rich and industrialized world has, by itself, been a significant factor for the dispersal of economic activities globally. It has generated huge demands for varied types of goods and services from the third world. In view of growing restrictions on immigration into the advanced world, some of these demands are being met through what has come to be labeled as business process outsourcing. Imagine the extent of imports into the world's largest and most affluent economy, namely the United States. Her huge demands on the global economy are evident in her huge and rising trade deficit with rest of the world, including the developing and oil exporting countries. These demands are no small inspiration for the third world to grow and industrialise. Consequently, some of the third world countries have been experiencing faster economic growth in recent decades.

Some of the third world countries have already demonstrated that economic transformation attained by the west in over half a century is achievable today in half this period thanks largely to the achievements of post-industrial society. For instance, the recent growth performance of eight of the East Asian economies has come to be labeled as an "economic miracle" on account of their faster transition into high income categories with low income inequalities. These high performing Asian economies (HPAEs) include Japan, the "Four Tigers" –Hong Kong, the Republic of Korea, Singapore, and Tiwan- and Indonesia, Malaysia, and Thailand. The following passage sums up some of the essence of this miracle.

"*Since 1960, the HPAEs have grown more than twice as fast as the rest of East Asia, roughly three times as fast as Latin America and South Asia, and twenty-five times faster than Sub-Saharan Africa. They also significantly outperformed the industrial economies and the oil-rich Middle east-North Africa region. Between 1960 and 1985, real income per capita increased more than four times in Japan and the Four Tigers....*" *(World Bank, 1993).*

Why can't the other third world countries emulate the experiences of the 'miracle' countries? An in-depth analysis of economic advancement of the advanced world and the above referred eight East-Asian countries reveals that economic freedom and competition and integration into the global economy continue to remain the most decisive determinants of economic success. The recent rapid economic growth of the world's most populated country, China, is also attributed to her global integration and growing competition within the country. Similar has been the experience of the erstwhile USSR. Both these countries had to radically reform their economies after long experimenting with an alternative economic system. Adam Smith had identified freedom of trade and enterprise or *laissez faire* as the greatest causes of the wealth of nations. Both these freedoms inspire and motivate individuals to pursue their self interests better than any other system. This inspiration explains why privately owned organizations, including one man enterprises, out-perform those owned and operated otherwise. These very inspirations lead to division of labour and specialization which in turn become the springs of invention and innovation so essential for raising the levels of productivity and prosperity. The role of government in *laissez faire*

is essentially limited to facilitating competition.

Currently this strategy has come to be referred to as globalization, implying competition and integration with the world economy. This, of course, does not imply that globalization is a recent development. It has a long history beginning with the discovery of sea routes centuries back. It has witnessed many phases and despite much talk of globalization these days, the movement of people and goods across nations was far easier earlier. Today crossing into another country requires lots of formalities and procedures. However, the realization that globalization and competition facilitate economic growth is being re-discovered. Perhaps, colonization of the third world had dealt a serious blow to this reality as the colonizers drained their colonies of their natural resources as well of other riches.

The situation has changed radically after the independence of these colonies after the Second World War. Globalization regained its instrumental importance to economic growth while the newly independent countries began attempts to transform their economies. Since countries which opened up their economies to global competition and foreign investment recorded impressive growth, globalization and liberalization emerged as important sources of economic growth. This is how globalization re-gained its relevance as an effective development strategy in the third world. Japan and the east-Asian Tigers would not have attained their present economic heights without integrating with the world markets. In the absence of the world markets these countries would have hardly achieved a fraction of their present levels of income and employment. The conclusions of Adam Smith's enquiry to into the nature and causes of the wealth of the nations at the time of the industrial revolution have only reinforced over time. It is worthwhile to recall his following the passage in this regard.

"Between whatever places foreign trade is carried on, they all of them derived two distinct benefits from it. It carries out the surplus part of the produce of their land and labour for which there is no demand among them, and brings back in return for it something else for which there is demand.... By means of it, the narrowness of the home market does not hinder the division of labour in any particular branch of art or manufacture from being carried to the highest perfection. By opening more extensive market for whatever part of the produce of their labour may exceed the home consumption, it encourages them to improve its productive powers, and to augment its annual produce to the utmost, and thereby to increase the real revenue and wealth of society"(Smith, 2003).

Thus free international trade or globalization besides providing an outlet for the surplus produce widens the extent of the market and scope of the division of labour. It also encourages technical innovations and overcomes technical indivisibilities besides generally enabling trading country to enjoy increasing returns and faster economic growth. J.S. Mill while commenting on Adam Smith's advocacy of free international trade argues that "increases in productivity" must be counted as benefits of high order. "Mill even went on to extend this doctrine to countries at 'at an early stage of industrial advancement', where international trade by introducing new wants 'sometime works as a sort of industrial revolution'.

The third world beset with serious and mounting economic problem has to follow the path which redeemed the advanced world as well as some of the newly industrialized countries from their poverty and backwardness. The path laid down two centuries back is open and effective even today. Efforts to

explore alternative routes or systems, like socialism or the mixed economy, have not been able to deliver as effectively as the market led economies. This is why countries which experimented with these systems have or are reverting back to the system based on freedom of trade and enterprise. This has been the case with India as well. When four decades of economic planning led the country to a serious balance of payments crisis in 1990-91, the country was left with no option but to experiment a package of modest economic reforms. The results were much beyond expectations as the package accelerated the overall as well as the export growth rate. It also generated a new phase of optimism about future economic possibilities especially on account of a large pool of technical manpower ready to be deployed in the booming information technology related industry in the English speaking advanced world.

The last couple of decades have been witnessing unprecedented economic growth and declining proportions of population labeled commonly as 'below the poverty line' in a large number of the developing countries. All these countries have been recoding this performance only after experimenting with some packages of economic and structural reforms. These countries include some of the former socialist countries. Consequently, many parts of the globe have been recording impressive growth in recent years. For instance, sub-Saharan Africa's growth rate of 2.4 per cent in the 1990s rose to 5.8 per cent in the last four years. Azerbaijan grew by a whopping 31 per cent in 2006. Recent growth rates of even Sudan, Rwanda and Liberia have been above 8 per cent. India also has been experiencing 9 per cent growth for the last couple of years. This performance has, no doubt, been helped by booming economies of the advanced world as well. Since globalization has led to the integration of world markets, fears of a slow down in the world's largest economy have begun to impact this impressive growth performance adversely[6].

The ongoing information revolution, led by the internet, has unprecedented potential to facilitate further the process of integration of the world economies and their speedy economic transformation. While scope of the industrial revolution was limited by capital reserves of a nation, information revolution is dependent on brain power which is already available in plenty in some of the third world countries. Since such countries generally have surplus manpower, including of the educated persons, requirements of brain power for the information revolution are not difficult to be met. Countries like India are already reaping dividends on account of their surplus of English speaking technical manpower and the ongoing information revolution. A large number of professionals from India are employed in the advanced world, especially the United States. Moreover, a large number of jobs in the advanced world are being transferred to the third world through business process outsourcing. The fast development of India's software industry and exports is also an outcome of globalisation. Most of the software professional working in India are engaged to satisfy outside demands for varied services. The country where mushroom growth of technical institutions has been taking place in the last decade or so is facing the shortages of technical manpower. Isn't glabalisation then an opportunity to usher in an era of rapid economic growth and prosperity?

Incidentally, globalisation promises to reward India for her failure to contain population growth as well. "A report by Goldman Sacks predicts that India would be the only economy consistently growing in excess of 5% annually till 2050." By 2020 USA will be short of 17 million people of working age, China by ten million, Japan and Russia by 9 and 6 million respectively. This time around India would have 47

million surplus of working age people to meet extreme manpower shortages. This is how India is poised to become the third largest economy by 2050. Thus globalisation is an opportunity and not a threat to third world. Let us seize the opportunity.

Footnotes :

1. This estimate is quoted in Sachs Jaffrey D. (2005), *The End of Poverty*, New York, Penguin Books. See also Maddison, Angus. (1995), *Monitoring the World Economy: 1820-1992*, Paris: OECD, and The *World Economy: A Millennial Perspective, Paris:* OECD, 2001.
2. This estimate is referred to in Strathern Paul (2002), *A Brief History of Economic Genius,* New York, Texere, p. 117.
3. A brief account of the industrial revolution is available in Ashton, T.S. (1972), *The Industrial Revolution; 1760-1830*, London, Oxford.
4. Industries where transport costs are no longer significant are referred to as 'footloose'. Such industries enjoy a great deal of freedom to their locations. It is due to the emergence of such industries that dispersal of industry has become possible to a good extent. For details of the declining transport orientation and dispersal of industry in India, see, Pandit, M.L. (1985), *Industrial Development of the Punjab and Haryana: Domination of Footloose Industries*, New Delhi, BR Publishing Corp.
5. A wonderful account of how communications and connectivity have helped to level the global playing field is available in Friedman, Thomas. L.(2006), *The World is Flat,* New York, Penguin Books.
6. For details and figures of growth rates quoted, see, Aiyar, Swaminathan S Anklesaria, " End of the 9% growth dream", *Times of India,* March 16, 2oo8, New Delhi.

References :

1. Keynes, J M. (1931) "Economic Possibilities for Our Grandchildren", Essays in Prersuasion, London, Macmillan, p. 360. See also Galbraith, John Kenneth (1984), *The Affluent Society,* Fourth Edition, Boston, Houghton Mifflin Company.
2. Cohen, Rogers (2008), "The Baton Passes to Asia", *New York Times,* March 31, 2008.
3. Sachs Jeffrey (2005), *The End of Poverty,* New York, Penguin Books, p. 27.
4. World Bank (1993), *The East Asian Miracle,* New York, Oxford University Press, p. 2.
5. Smith, Adam (2003), *The Wealth of Nations,* New York, Bantan Classics Edition, Random House.

Globalisation, Economic Growth and Exclusion: The Indian Experience

Sachinandan Sau*

Globalisation may promote economic growth, but that is not uniform across sectors and regions of india. Both agricultural and industrial growth rates have been decelerating during the globalization era. Growth of employment also shows a declining trend while elasticity of employment keeps on declining. There is growing disparity as well as discontent. Social exclusion is substantial and wide across regions and gender. Unemployment rate is substantial in both rural and urban areas of India and across sexes. In all cases of usual status adjusted, currently daily status and current weekly status rate of female unemployed is higher than that of male. Similarly among the educated of age 15 years and above this rate is higher for female than that of male on both usual status and currently weekly status basis. Though rural poverty ratio (head count ratio) declined sharply in India in recent years there is high rural and urban and overall poverty ratio differential across states of India. The absolute number of poor in both rural and urban India declined slowly and that was massive copared to the total population of many developed countries. Incidence of poverty was among the agricultural labourers. Inequality has started increasing in both rural and urban India. Gender gap in literacy rate has been high in both rural and urban India.

1. Introduction

Globalisation as a process of integration of an economy into the global economy through its opening up to world trade, trade in capital and technology, leads to increasing foreign direct investment (FDI) and this booming FDI is widely believed to promote economic growth. Chakrabarti and Nunnekamp (2008) by subjecting industry-specific FDI and output data to Granger causality tests within a panel co-integration framework observed that (i) FDI stocks and output are mutually reinforcing in the manufacturing sector in the long run, (ii) any causal relationship is absent in the primary sector, and (iii) most strikingly, effects of FDI in the services sector are transitory. FDI in the services sector that accounts for sharply rising share of FDI appears to have promoted growth in the manufacturing sector through cross-sector spillovers.

As regards service sector Dev (2000) observed, "The higher share of services in South Asia could be due to people going to low productivity jobs in the informal sector. In future also, service sector employment will grow much faster than industrial employment. Those quitting agriculture and migrant will be absorbed more by the service sector rather than by manufacturing". While discussing the impact of FDI on the poor Tsai. and Huang (2007: 1858-71) observed, inward FDI had no significant impact on the mean income of the poor but outward FDI from Taiwan in the past two decades served to have had adverse effect on the poorest 20 per cent of the population, most likely through job destruction and wage

* Professor of Economics, Vidyasagar University, Midnapore (West Bengal).

depression. Sen (2001) notes, "Doubts about the global economic order— have to be viewed in the light of the dual presence of abject misery and unprecedented prosperity in the world in which we live. Even though the world is incomparably richer than ever before, ours is also a world of extraordinary deprivation and staggering inequality". Sen (2004) also notes, "It is certainly true that global capitalism is typically much concerned with expanding the domain of market relations than with, say establishing democracy, or expanding elementary education, or enhancing social opportunities of the underdogs of society. Mere globalisation of markets, on its own, can be a very inadequate approach to world prosperity. In keeping that recognition constantly in focus, scrutiny and protest can play a constructive part."

In the globalization era the developing countries are led to follow the neo-liberal policy. The pursuit of this policy, particularly fiscal rectitude, limited intervention with the scope of intervention designed to promote exports in the form of incentives / subsidies that is reminicient of the mercantile / commercial policy advocated during the mercantile era and prior to the era of A. Smith has resulted in social tension in very recent time. Adam Smith in his Wealth of Nations observed while discussing Political Economy and mercantile policy of bounties and drawbacks to promote exports,

"It is altogether for the benefit of the producer that bounties are granted upon the exportation of some of his productions. The home-consumer is obliged to pay, first, the tax which is necessary for paying the bounty, and secondly, the still greater tax which necessarily arises from the enhancement of the price of the commodity in the market. —It cannot be very difficult to determine who have been the contrivers of this whole mercantile system; not the consumers, we may believe, whose interests have been entirely neglected; but the producers, whose interests have been so carefully attended to; and among the latter class our merchants and manufacturers have been by far the principal architects. In the mercantile regulations the interest of our manufacturers has been most peculiarly attended to; and the interest, not so much of the consumers, as that of some others sets of producers, has been sacrificed to it".

Patnaik (2008) observs that the income deflation on the working people including the peasantry has been brought about by the imposition of neo-liberal policies and over the longer term this income deflation has undermined the very viability of present agriculture, adversely affecting supply. All this is part of the process of "accumulation through encroachment" which had been a central feature of colonialism and has re-emerged with a vengeance in the era of globalization.

The neoclassical economists, however, argue that benefits of economic growth resulting from globalization would trickle down to the poor and therefore economic growth would be inclusive, not exclusive. Empirically we observe that the issue of 'social exclusion' has developed in recent years and this concept has gained popularity to 'correct' contemporary imbalances in social development (Bhattacharya 2008).

Sen (2000) draws attention to various meanings and dimensions of the concept of social exclusion. Distinction is drawn between the situation where some people are being kept out (at least left out), and where some people are being included (may even be forced to be included) in deeply unfavorable terms, and described the two situations as "unfavorable exclusion" and "unfavorable inclusion." The "unfavorable inclusion" with unequal treatment may carry the same adverse effects as "unfavorable exclusion".

Sen also differentiated between "active and passive exclusion". For the casual analysis, and policy response, Sen argued that "it is important to distinguish between "active exclusion" - fostering of exclusion through the deliberate policy interventions by the government, or by any other willful agents (to exclude some people from some opportunity), and "passive exclusion" which works through the social process in which there are no deliberate attempts to exclude, but nevertheless, may result in exclusion from a set of circumstances.

Further elaboration of the concepts of exclusion or discrimination has come from the mainstream economics in the context of race and gender. The mainstream economic literature throws more light on discrimination that works through markets, and developed the concept of market discrimination with some analytical clarity. In the market discrimination framework, exclusion may operate through restrictions on the entry in market, and/or through "selective inclusion", but with an unequal treatment in market and non-market transactions (this is close to the Sen's concept of unfavorable inclusion). It leads to inequality and occasions exclusion of weaker sections of society.

Poor and unemployed people are the main victims of social exclusion and marginalisation. As the gap between the rich and the poor grows, concentrated areas of deprivation and exclusion are also growing in urban centers.

Against this brief backdrop the present note examines some development issues concerning globalization, namely pattern of economic growth and exclusion with reference to India.

2. Flow of FDI and Pattern of Economic Growth in India

As per UNCTAD, online database, FDI during the globalisation era in India boomed from less then US $ 2 billion in 1991 to US $ 45 billion in 2005. Services sector accounts for sharply rising share of FDI. But favourable growth effects of FDI in India are largely restricted to the manufacturing sector.

So far as India's overall economic growth is concerned it is observed that India registered 5.37 per cent annual growth in gross state domestic product (GSDP) during the pre-reforms period from 1980-01 to 1990-01, which recorded an increase to 6.13 per cent during 1993-94 to 2000-01. But it is worth noting that of the 14 sample major states 9 states registered lower growth rate in GSDP during the globalization era from 1993-94 to 2000-01 than that during the pre-globalisation period of 1980-81 to 1990-91. Growth rate in per capita GSDP was, however, higher for most of the states during the globalization era (Table 1). During the three year period 2000-01 to 2002-03 the Indian economy witnessed about 4.7 per cent of economic growth, which picked up to strong 8 per cent + growth during the next five years. But thereafter it has been going to start slowing down (Kumar 2008).

Table 1 Growth Rates of Gross State Domestic Product (GSDP) and Per Capita GSDP (%)

States	Growth Rate in GSDP (%)		Growth Rate in Per Capita GSDP (%)	
	1980-1 to 1990-1	1993-4 to 2000-01	1980-1 to 1990-2	1993-4 to 2000-2
Andhra Pradesh	5.50	5.31	3.33	4.04
Assam	3.51	2.59	1.37	0.98
Bihar	4.55	4.50	2.42	2.81
Gujarat	4.96	5.98	3.00	4.39
Haryana	6.23	5.57	3.81	3.68
Karnataka	5.16	7.92	3.2	6.41
Kerala	3.51	5.17	2.13	4.05
Madhya Pradesh	4.46	4.33	2.10	2.36
Maharashtra	5.85	5.75	3.56	4.30
Orissa	4.20	3.22	2.39	2.00
Punjab	5.18	4.96	3.30	3.01
Rajasthan	6.39	6.26	3.84	4.22
Tamilnadu	5.24	6.04	3.80	4.99
Uttar Pradesh	4.83	5.26	2.54	3.10
West Bengal	4.60	6.88	2.41	5.32
All- India	5.37	6.13	3.24	4.38

Looking at the sectoral composition of growth reveals that the source of higher growth in India since 1992 has been the service sector. In fact, average annual growth rates in both agriculture and industry sectors seem to be lower by about half a per cent during the post-liberalization era compared to the pre-liberalization period. It is only the service sector that has accelerated to 7.8 per cent during 1992-2002 from 6.7 per cent during 1981-90 (Table 2) and this sector has been the principal driver of the GDP growth.

Table 2 Average annual Growth in GDP by Sector, 1981-2 to 1990-1 and 1992-3 to 2002-3

	1981-2 to 1990-1	1992-3 to 2001-2	1992-3 to 2002-3
GDP	5.6	6.1	5.9
Agriculture	3.8	3.3	2.7
Industry	7.0	6.3	6.4
Service	6.7	7.8	7.8

Source: Panda (2005: 22).

Annual growth rate in agriculture by crops shows the sharp decline in annual growth of both foodgrains and non-foodgrains production – the former from 2.9 per cent during 1981-90 to 0.8 per cent during 1992 to 2002. and the latter from 4.8 per cent to 0.8 per cent. Oilseeds production registered negative annual growth of -1.2 per cent during the globalization era (Table 3).

Table 3 Annual Growth Rates in Index of Agricultural Production (per cent per annum)

Year	All crops	Foodgrains	Non-foodgrains	Oilseeds	Cotton	Sugarcane
1981-90	3.5	2.9	4.8	7.0	2.8	2.6
1992-2001	2.1	2.4	1.8	1.1	1.3	1.9
1992-2002	0.8	0.8	0.8	-1.2	0.5	1.1

Source: Panda (2005: 23).

Average annual growth rate in index number of industrial production in India shows sharp decline in mining and quarrying from 7.3 per cent during 1982-90 to 2.1 per cent during 1996-2002. Manufacturing,

electricity and industry in general showed also decelerating growth in production (Table 4).

Table 4 Average Annual Growth Rates in Index Number of Industrial Production (per cent per annum)

Year	Mining and quarrying	Manufacturing	Electricity	General
1982-90	7.3	7.6	8.9	7.7
1994-2002	3.8	7.0	5.7	6.6
1996-2002	2.1	5.7	4.9	5.3

Source: Panda (2005: 24).

Annual growth rate of production of basic industrial goods showed marginal decline while that of capital goods and consumer durables experienced relatively sharp decline during the reforms period. There was acceleration of growth, though marginal in consumer goods production (Table 4a).

Table 4a Growth in Index Number of Industrial Production by Used Based Sectors (per cent per annum)

Year	Basic goods	Capital goods	Intermediate goods	Consumer goods	Consumer durables	Consumer non-durables
Averages						
1982-90	7.5	12.0	6.2	5.9	14.2	4.5
1994-2002	7.5	10.6	5.8	6.2	12.0	5.3
1996-2002	7.1	9.3	5.3	6.2	10.1	5.6

Source: Panda (2005: 25).

3. Exclusion in India

There has been increasing casualisation of rural male workers. As per National Sample Survey Report proportion of casual rural male workers on usual status [principal status (ps) +subsidiary status(ss)] increased from 29.2 to 32.9 per cent during 1983 (38th round of NSS) to 2004-05 (61st round). During this period there was decline in proportion of both rural and urban regular male employees on usual status (ps +ss) from 10.3 to 9.0 per cent and 43.7 per cent to 40.6 per cent respectively.

On usual status basis annual growth rate of rural manufacturing employment of India during 1983-93 was 2.41 per cent, which declined to 1.78 per cent during 1993-2000 and that of urban manufacturing employment fell from 2.21 per cent to 1.83 per cent during this period. For all sectors taken together, annual growth of employment declined from 1.75 per cent to 0.66 per cent in rural areas and from 3.27 per cent to 2.27 per cent in urban areas (Table 5). Elasticity of manufacturing employment registered decline from 0.32 during 1983-93 to 0.20 during 1993-99 and that for all sectors taken together from 0.36 to 0.13 during this period (Table 6).

Table 5 Growth of Employment (Usual Status) in Rural and Urban India, 1983-93 and 1993-2000 (per cent per annum)

	Rural		Urban	
	1983-93	1993-2000	1983-93	1993-2000
Agriculture and allied	1.38	0.18	1.54	-3.4
Mining and quarrying	3.84	-2.28	4.15	-3.71
Manufacturing	2.14	1.78	2.21	1.83
Electricity, gas and water supply	4.7	-5.65	4.46	-4.19
Construction	5.18	6.43	6.2	6.26
Trade, hotels, and restaurants	3.72	1.18	3.94	5.54
Transport, storage, and communication	4.58	7.29	2.9	3.91
Finance, insurance, real estate	5.99	2.51	5.63	7.05
Public administration, community and personal services	3.13	0.32	4.16	0.13
Total non-agriculture	3.23	2.31	3.54	2.96
All sectors	1.75	0.66	3.27	2.27

Sources: Chadha and Sahu, EPW, 25 May 2002

Table 6 Elasticity of Employment with Respect to Income in India, 1983-93 and 1993-99

	1983-93	1993-99
Agriculture and allied	0.48	0.01
Mining and quarrying	0.61	-0.49
Manufacturing	0.32	0.20
Electricity, gas and water supply	0.48	-0.52
Construction	1.27	1.00
Trade, hotels, and restaurants	0.67	0.38
Transport, storage, and communication	0.55	0.56
Finance, insurance, real estate	0.49	0.68
Public administration, community and personal services	0.63	0.02
All sectors	0.36	0.13

Sources: Chadha and Sahu, EPW, 25 May 2002

Unemployment rate by sex and region of India as shown in Table 7 reveals that as per National Sample Survey, 60th Round, January-June 2004 in all cases of usual status adjusted, currently daily status and current weekly status rate of female unemployed is higher than that of male in both rural and urban areas. Similarly among the educated of age 15 years and above this rate is higher for female than that of male on both usual status and currently weekly status basis.

Mukhopadhyay and Rajaman (2007) pbserves that there is an overall rise in rural unemployment in terms of both total and partial failure to find work. There is higher unemployment rate among the low end of the education spectrum. During the 55th (1999-2000) and 61st rounds (2004-05) of NSS STs face the highest incremeantal unemployment remains unchanged into the 61st round. There is reduced unemployment among SC males and Muslim males and females.

Table 7 Unemployment Rate by Sex in Rural and Urban India, 2004-05 (per 1000)

	Rural			Urban		
	Male	Female	Person	Male	Female	Person
Unemployment Rate (Usual Status Adjusted)	16	18	17	38	69	45
Unemployment Rate (Current Weekly Status)	38	42	39	52	90	60
Unemployment Rate (Current Daily Status)	80	87	82	75	116	83
Unemployment Rate (Usual Status Adjusted) of Educated Persons of Age 15 Years and Above	44	152	65	51	156	71
Unemployment Rate (Current Weekly Status) of Educated Persons of Age 15 Years and Above	65	182	85	62	179	83

Source: National Sample Survey, 60th Round, January-June 2004.

Though rural poverty ratio (head count ratio) declined sharply in India from 45.76 per cent in 1983 to 29.18 per cent in 2004-05, urban poverty ratio from 42.27 per cent to 26.02 to 26.02 per cent and overall 44.93 per cent to 28.27 per cent during this period there is high rural and urban and overall poverty ratio differential across states of India. During 2004-05 Orissa registered highest rural poverty ratio (47.76 per cent) and urban poverty ratio (43.34 per cent) and overall poverty ratio (47.07 per cent). Bihar followed Orissa in respect of rural povery ratio (43.06 per cent) and overall poverty ratio (41.53 per cent) during 2004-05 while the lowest poverty ratio was recorded by Jammu and Kashmir (rural, urban overall poverty ratio being 4.81 per cent) (Table 8). The absolute number of poor in india as a whole declined slowly from 324.34 million in 1983 to 315.48 million in 2004-05. The total number of poor in India in 2004-05 surpassed the total number of population of Germany (82.6 million), France (60.3 million), United Kingdom (59.5 million), Italy (58.0 million), Australia (19.9 million), Belgium (10.4 million), Hungary (10.0 million), Denmark (5.5 million) and New Zealand (4.0 million) in 2004.

Roy (2008) observs, Indian budget surveys show a decline in calorie intake and rise in undernourishment rate through out the 1990s.

Table 8 Poverty Ratio (Head Count Ratio) in Major States by Region, 1983, 1993-04 and 2004-05 (Per cent)

States	Rural			Urban			All		
	1983	1993-04	2004-05	1983	1993-04	2004-05	1983	1993-04	2004-05
Andra Pradesh	27.31	16.64	10.85	37.49	37.63	25.41	29.75	22.3	14.8
Assam	41.92	44.43	23.05	23.07	10.19	3.83	40.03	40.46	20.46
Bihar	64.89	57.24	43.06	47.49	36.54	31.66	62.71	54.5	41.53
Gujarat	27.92	22.44	19.76	38	29.44	11.96	31.11	24.92	16.75
Haryana	21.77	26.62	13.41	25.47	17.54	15.06	22.59	24.26	13.92
Himachal Pradesh	17.77	29.27	12.5	16.01	8.26	3.87	17.63	27.37	11.61
Jammu and Kashmir	25.23	19.73	4.81	17.48	7.38	4.81	23.57	16.75	4.81
Karnataka	37.51	30.24	23.73	42.88	39.67	33.4	39.08	33.25	27.15
Kerala	38.46	26.49	12.27	45.11	25.45	20.86	39.81	26.22	14.48
Madhya Pradesh	48.21	40.43	38.17	53.11	48.29	34.44	49.23	42.3	37.21
Maharashtra	45.04	37.66	30.36	39.69	34.74	29.42	43.13	36.5	29.95
Orissa	67.52	50.11	47.76	49.19	41.02	43.34	65.31	48.85	47.07
Punjab	14.3	13.72	9.55	23.52	11.83	5.57	16.88	13.14	8.12
Rajasthan	37.72	26.89	18.91	38.81	31.55	29.81	37.95	27.96	21.48
Tamilnadu	56.22	32.99	22.96	47.94	38.92	34.06	53.48	35.2	28.31
Uttar Pradesh	46.38	42.33	34.06	49.47	36.15	30.29	46.94	41.08	33.25
West Bengal	61.56	37.35	28.49	31.5	23.24	18.5	53.6	33.45	25.67
All India	45.76	37.26	29.18	42.27	32.56	26.02	44.93	36.02	28.27

Percentage distribution of persons below poverty line by occupation in India and the state of West Bengal shows that there was the highest incidence of poverty among the agricultural labourers during both 1993-94 and 1999-2000. During 1999-2000 self-employed in agriculture represented the second highest poverty ratio in India (Table 9).

Table 9 Poverty Ratio in West Bengal and India by Occupation, 1993-94 and 1999-2000 (Per cent)

	West Bengal		India	
Occupation	1993-94	1999-00	1993-94	1999-00
Artisans	18.3	20.4	11.2	12.3
Agl Lab	44.1	55.4	40.7	46.8
Non-Agl Lab	13.7	5.5	8.4	7.6
Self-emp in Agl	21.5	15.4	33.2	28.1
Others	2.5	3.3	6.5	5.3
Total	100	100	100	100

It is important and significant to note that in both India and the state of West Bengal Gini ratio as a measure of inequality recorded decline in rural areas of the former from 30.4 per cent in 1983 to 28.6 per cent in 1993-94 and of the latter from 30.0 per cent to 25.4 per cent during this period. But that started

increasing to reach 30.5 per cent in rural India and 27.4 per cent in rural West Bengal during 2004-05. In urban India and West Bengal the Gini ratio kept on increasing during the whole period from 1983 to 2004-05 (Table 10). Bardhan (2004) observed that in the absence of effective social policies and hasty liberalization attempts inequality and liberalization can positively reinforce each other as is operational in South Asia.

Table 10 Measure of Inequality (Gini Ratio) in West Bengal and India, 1983, 1993-94 and 2004-05 (Per cent)

Region	West Bengal			All India		
	1983	1993-94	2004-05	1983	1993-94	2004-05
Rural	30	25.4	27.4	30.4	28.6	30.5
Urban	33.5	33.9	38.3	33.9	34.4	37.6

There is also high gender gap in literacy rate in both rural and urban areas, it being higher in rural India (18.6 percentage point) than that in urban India (11.2 percentage point) in 2004-05. Gender gap in literacy rate was highest in rural Rajasthan (27.5 percentage point) and urban Rajasthan (17.3 percentage point). Jharkhand (25.6 per cent point) followed Rajasthan in rural gender gap in literacy rate and Bihar followed Rajasthan in urban gender gap in the same (Table 11).

Table 11 Gender Gap in Literacy Rate in States of India in Rural and Urban Areas, 2004-05 (Percentage Point)

States	Rural	Rural	Gap	Urban	Urban	Gap
	Male	Female		Male	Female	
Andra Pradesh	55.8	39.1	16.7	76.7	62.5	14.2
Assam	75.1	63.5	11.6	85.6	78.8	6.8
Bihar	52.7	32.6	20.1	75.6	60.2	15.4
Chattisgarh	64.7	43.4	21.3	82.4	68.7	13.7
Gujarat	69.3	46.9	22.4	84.7	73.6	11.1
Haryana	68.1	47.3	20.8	79.6	66.9	12.7
Himachal Pradesh	79.1	64.1	15	81	78.9	2.1
Jammu and Kashmir	67.1	46.4	20.7	80	65	15
Jharkhand	59.8	34.2	25.6 (2)	83.6	68.7	14.9
Karnataka	62.2	46.7	15.5	82	69.4	12.6
Kerala	85	80.6	4.4	87.4	83.9	3.5
Madhya Pradesh	59.1	36	23.1	78.8	65.1	13.7
Maharashtra	71.8	55.1	16.7	84.3	69.8	14.5
Orissa	62.5	45	17.5	77.3	66.4	10.9
Punjab	67.5	58.8	8.7	80.6	73.1	7.5
Rajasthan	58.8	31.3	27.5 (1)	72.2	54.9	17.3
Tamilnadu	82.4	54.5	27.9	85.6	75.6	10
Uttaranchal	70.8	50.3	20.5	82.2	69.8	12.4
Uttar Pradesh	58	36	22	71	59.4	11.6
West Bengal	67.9	53.9	14	84.5	76.1	8.4
All India	63.6	45.0	18.6	80.5	69.3	11.2

4. Conclusions

Globalisation may promote economic growth which is not uniform across sectors and regions of india. Both agricultural and industrial growth rates have been declining during the globalization era. Growth of employment also shows a declining trend while elasticity of employment keeps on declining. There is growing disparity as well as discontent. Social exclusion is substantial and wide across regions and gender. Unemployment rate is substantial in both rural and urban areas of India and across sexes. In all cases of usual status adjusted, currently daily status and current weekly status rate of female unemployed is higher than that of male. Similarly among the educated of age 15 years and above this rate is higher for female than that of male on both usual status and currently weekly status basis. Though rural poverty ratio (head count ratio) declined sharply in India in recent years there is high rural and urban and overall poverty ratio differential across states of India. The absolute number of poor in both rural and urban India declined slowly and that is massive copared to the total population of many developed countries. There was the highest incidence of poverty among the agricultural labourers Inequality has started increasing in rural and urban India. Gender gap in literacy rate is high in both rural and urban India.

Not only economic growth but also growth in employment opportunities can address the issues of disparity and exclusion. The government need to play pro-active role in human development so that growth be inclusive and benevolent and serving the human beings. Human capital development could foster linkages within and across sectors and sections of society so as to address issues of social exclusion judiciously and effectively.

References :

1. Bardhan, P. (2004), "The Impact of Globalisation on the Poor", *Brookings Trade Forum*, 1, 271-96.
2. Chakrabarti, C. and P. Nunnekamp (2008), "Globalisation and Growth, *World Development*, Vol.36, No.
3. Kumar, A. (2008), "Faltering National and Global Growth Prospects", *Economic and Political Weekly*, July 12.
4. Mukhopadhyay, A. and I. Rajaman (2007), "Rural Unemployment 1999-2005 : Who Gains, Who Loses", *EPW*.
5. Patnaik, P. (2008), "The Accumulation Process in the Period of Globalization", *EPW*, June 28 - July 5-11.
6. Ramaswami, K. V. (2007), "Regional Dimensions of Growth and Employment", *EPW*, December 8.
7. Roy, R. (2008), "Diversity in Calorie Sources and Undernourishment during Rapid Economic Growth", *EPW*, February 23-29.
8. Sengupta, A, K. P. Kanan and G. Raveandran (2008), "India's Common People : Who are They, How Many Are They and How do They Live?", *EPW*, March 15, 2008.
9. Sen, A (2002), "Globalisation, Inequality and Global Poorest", *Development* 45(2), 12-16.
10. *Smith J.W (2003), Cooperative Capitalism; A Blueprint for Global Peace and Prosperity,Quality Books, Inc.*
11. Tsai, P.L. and C.h. Huang (2007), "Openness, Growth and Poverty: The Case of Taiwan', *World Development.*
12. Wagle, U.R. (2007), "Are Economic Liberalisation and Equity Campatible? Evidence from South Asia", *World Development.*

Marginalized Sections in Poverty Alleviation Programmes : Reflection on Their Shares and Benefits

Dilip Kumar Ghosh*

Since the days of the Sixth Five Year Plan, direct assault on poverty menaces was initiated under the slogan 'Garibi Hatao'. A number of programmes were launched since then along with much experimentation all over the country. The set of measures launched include both self and wage employment programmes. Major thrust was given on eradication of rural poverty as more than seventy percent of the country's population live in the rural areas. In spite of all these measures, the Tenth Five Year Plan observed that at the beginning of the new millennium, 200 million people in the country did not have adequate incomes to access a consumption basket defined as poverty line. The programmes included self- employment programmes like Integrated Rural Development Programme (IRDP), skill development programme for rural youths, employment assurance programmes for guaranteeing employment through wage employment programmes etc. The goal of all these programmes was to alleviate poverty in the rural areas. From the official reports and academic exercises, it can be visualized that the impact of these programmes differ form State to State. Though overall rate of poverty is declining, yet in some States the absolute number of people reeling under poverty increased. This raises the question of equitable distribution of the benefits of the programme. For protecting the interests of the marginalized sections, viz. scheduled castes, scheduled tribes and women, most of the programmes incorporated provisions in the guidelines for safeguarding their interests. This aspect is studied with a focus on major alleviation programmes. For the present purpose, we consider IRDP, TRYSEM, JRY and EAS. For making impact assessment of the programmes along with the examination of operational process, the Government of India in Ministry of Rural Development time to time conducted concurrent evaluation studies. These studies are consulted to have a view of programme implementation.

1. Introduction

The major concerns of India's National Government since inception of the planning era hover around growth with social justice. This means equitable distribution of benefits of development. With the passage of time, however, this proves to be a non-attainable goal where the disparities among the constituent states become the reality. It was from the Sixth Five Year Plan (1980-85) when the National Government launched specific programmes both in the rural and urban areas to combat poverty directly thrust was concentrated on the rural areas not only for the fact that the majority of the people lived in these areas, but also for the severity of the problem. The Sixth Five Year Plan very clearly set the priority on reducing poverty :

"So far, it has not been possible to make a major dent on poverty on account of the inadequate

*Former Faculty, State Institute of Panchayats and Rural Development, Government of West Bengal, Kalyani and presently Sub-Divisional Officer, Purulia (West), West Bengal.

rate of growth of the economy, uneven distribution of income and consumption as well as high rate of growth of population. The reduction in poverty should, therefore, receive the highest priority in our development strategy."

On the basis of this priority, the Sixth Plan projected that the percentage of population below the poverty line (i.e. on the basis of head count ratio) could be reduced to 30 percent at the end of the plan period (1984-85) and further it could be brought down to 10 percent by the end of the year 1994-95 (i.e. by the end of the Eighth Five Year Plan). After the Seventh Five Year Plan (1985-90), two more years (1990-91 and 1991-92) were taken to enter the Eighth Five Year Plan (1992-97). These projections remained unachieved even after launching and continuity of a host of programmes comprising self and wage employment programmes including skill development of the rural youths. The programmes introduced in the Sixth Plan were Integrated Rural Development Programme (IRDP), Training of Rural Youth for Self Employment (TRYSEM) and Development of Women and Children in Rural Areas (DWCRA) under the category of self employment programmes while programmes like National Rural Employment Programme (NREP) and Rural Landless Employment Guarantee Programme (RLEGP) were the wage employment programmes. From the Sixth Plan to the beginning of the Tenth Five Year Plan (2002-07) many experiments were made with the self and wage employment programmes of the rural areas.

Some were discontinued, merged with other programmes to give birth to a new programme or revamped with new nomenclature. All these are the issues of discussion in the present paper. In most of the programmes special safeguards for the marginalized sections of the society were prescribed. These sections include people of the scheduled caste and scheduled tribe communities and women. The incorporation of these protection measures reflects the social justice aspect of the programme guidelines.

In this backdrop the present study is taken up with the following objectives :

(i) to get an overview of the shares of the marginalized sections in different programmes vis-à-vis the provisions made in the programme guidelines;

(ii) to enquire into the benefits delivered by the programmes, viz. employment received in wage employment programmes, adequate financial assistance in self-employment programmes or number of youths utilising the skill development training etc.

and (iii) to have a look into the delivery system of respective programme and their strengths and weaknesses.

The paper is structured in the following manner ;

In Section 2, implementation of the major poverty alleviation programmes,viz. IRDP, TRYSEM, JRY and EAS are discussed with focus on the share of the marginalized sections. These four programmes are considered for their longer duration in comparison with many other short lived programmes like Million Wells Scheme, Toolkits distribution programme or recent programmes like SGRY. IRDP and TRYSEM continued for nineteen years (from 1980-81 to 1998-99), JRY had the life of ten years (1989-90 to 1998-99) while EAS had the tenure of slightly less than eight year (from 2nd October 1993 to 25th September 2001). In this paper we considered fifteen major states of the country. The states are Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab,

Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. Erstwhile Bihar, Madhya Pradesh and Uttar Pradesh are considered as these states were bifurcated recently. Section 3 presents West Bengal scenario on the basis of disaggregated district data. These data are available from the Department of Panchayats and Rural Development, Government of West Bengal (GOWB). In West Bengal, all poverty alleviation programmes were implemented by three-tier panchayat institutions at the district, block and village levels. Till now, the same procedures are being adopted to implement the self and wage employment programmes in existence. The delivery mechanisms of these programmes as practiced in West Bengal are discussed in Section 4.

2. Poverty Alleviation Programmes

Integrated Rural Development was an approach for rural development and poverty alleviation through comprehensive measures. The target group of the programme included the poorest of the poor in the rural areas, namely small and marginal farmers, agricultural laborers, rural artisans, etc. The mode of providing assistance in the programme was to endow the rural poor with assets and inputs so that adequate additional income would generate for the assisted to go beyond the poverty line and became non-poor. According to the guidelines of the programme, the capital costs of the assets were subsidized through the government funds and the proportionate bank credit mobilized from the commercial banks, regional rural banks and cooperative banks. The programme was all encompassing and spreaded in all the blocks of the country. The quantitative achievement of the programme in physical and financial terms was highly applauded as it was possible to reach the targets. In spite of initial achievements, the Seventh Five Year Plan identified some shortcomings in the programme implementation which urged for immediate rectification. No specific earmarking of assistance in favour of women is one such example. From the Seventh Plan, 30 percent coverage of women was included in the programme guidelines. In view of the Seventh Plan, the IRDP was launched with very little preparation :

"Many of the shortcomings of the Integrated Rural Development Programme would appear to stem from the fact that a programme of massive dimensions, having a multiplicity of critical parameters and functioning in a highly diverse environment, was launched with what can be called very little preparation. The Sixth Plan period could be called a period of trial in which the programme has gradually come to be known, understood and even stabilized. The gaps that have been revealed and the weaknesses that have been experienced in this process will be remedied in the Seventh Plan so as to make the IRDP an effective instrument of poverty alleviation".

For overcoming the limitations, the Seventh Plan proposed to continue the programme with sufficient care and to provide supplementary assistance to the families assisted during the Sixth Plan, but could not cross the poverty line. During the Seventh Plan, it was proposed to assist the poorest among the poor having an annual household income of Rs. 4800 which was substantially lower than the poverty line income of Rs. 6400 per annum. It was targeted in this plan to provide assistance to 20 million families where 10 million families would be assisted for the first time and 10 million would get supplementary assistance. However, it was not possible to achieve both the quantitative target and women coverage in the Seventh Plan – it was possible to assist only 181.77 lakh families.

During the Eighth Five Year Plan also the strategy to expand the employment opportunities among

the rural poor through special employment programmes continued. This can be corroborated in the words of the Eighth Plan document :

"..... short term employment will have to be provided to the unemployed and under employed, particularly among the poor and vulnerable sections, through the existing special employment programmes like IRDP and JRY. However, it must be recognized that while they meet the short-term objective of providing temporary work to the unemployed, they must contribute to the creation of productive capacity of areas and/ or individuals. This would be better achieved by a greater integration of the existing special employment programmes with other sectoral development programmes, which, in turn, would generate larger and more sustainable employment".

In course of reviewing the achievements of IRDP during the Eighth Plan, it can be observed that in quantitative terms, the targets were not achieved. The Ninth Plan noted the achievements of Eighth Plan in following words :

"In quantitative numbers, 10.82 million families were covered under IRDP against the initial target of 12.6 million families fixed for the entire Eighth Plan period. However, from 1995-96, physical targeting under the programme was abolished with the focus shifting to financial targets and qualitative parameters. Of the families covered, 50.60 percent were scheduled castes/ scheduled tribes and 33.59 percent women. The coverage of women was still lower than the target of 40 percent".

Ninth Five Year Plan, however, put emphasis on continuation of direct poverty alleviation programmes on an expanded scale. In course of designing the strategies during the plan period, the plan document suggested a strategic shift under IRDP from an individual beneficiary approach to group and/ or cluster approach. On the issue of empowering women, the Ninth Plan stressed on expansion of employment-cum-income generation opportunities for women and to cover 'as many women as possible living below the poverty line'. The plan document laid down that priority would be given to female-headed households and 'women in extreme/ abject poverty'.

With effect from Ist April, 1999, IRDP was restructured as the Swarnajayanti Gram Swarozgar Yojana (SGSY) with the objective to achieve additional income through acquisition of productive assets or appropriate skills on a sustained basis for the rural poor and to enable them to cross poverty line. According to Mid term Appraisal of Ninth Plan, the women coverage under IRDP fell short of the targeted coverage of 40 percent of total beneficiaries. To quote from the document :

"During first two years of the Ninth Plan (1997-98 and 198-99), about 3.37 million families are reported to have been covered of which 46 percent were Scheduled castes/ Scheduled tribes and 35 percent women".

For periodic evaluation of IRDP, the Government of India introduced a system of concurrent evaluation since October 1985 through reputed research institutions all over the country. During the Seventh Plan, three rounds of concurrent evaluation were completed – these were first round during October 1985 to September 1986, second round during January – December 1987 and the third round during January to December 1989. Third round Concurrent Evaluation Report provided information on State and Union territory wise coverage of women indicating that the coverage was very much lower (20.25

percent) than the Seventh Plan target of 30 percent. This report showed that the states like Andhra Pradesh (19.20) Bihar (12.30%), Madhya Pradesh (18.94%), Orissa (15.77%), Rajasthan (15.49%), Uttar Pradesh (14.40%) and West Bengal (16.17%) had very low coverage of women (percentage coverage of women showed within brackets along with the name of the states). According to this evaluation report, out of twenty five States and six Union territories, only three from each group became able to register 30 percent coverage in favour of women. This was the state of affairs after more or less a decade of implementation of the programme. Two more rounds of concurrent evaluation were undertaken by Ministry of Rural Development, Govt. of India before restructuring of IRDP. The fourth round of survey was organised during September 1992 to August 1993 and the fifth round was held during July 1995 to June 1996. The fifth round survey found that only 14.18 percent of the women headed households received IRDP assistance, though in the programme guidelines it was mentioned that priority should be given to female-headed households. In West Bengal, 15.37 percent women headed households received assistance under IRDP. Even in Uttar Pradesh, Bihar, Madhya Pradesh, Orissa and Rajasthan, the coverage of women headed households is higher than that in West Bengal – the respective percentages are 18.34, 20.94, 18.32, 29.64 and 52.54. In West Bengal, the task of identification of beneficiaries was bestowed on gram panchayats and panchayat samitis; block and village level functionaries, in general did not participate in the identification process – they merely acted as facilitators in the whole process of implementation of the programme. The fifth round concurrent evaluation report provided a distribution of women beneficiaries on the basis of their educational status – at all India level, of total women beneficiaries in the survey, 67.24 percent were illiterate, 11.10 percent were literate but not attended any formal education, 13.38 percent were found to be literate up to primary standard and 8.28 percent were educated above the primary level. Of total schemes given to the women in West Bengal, 32.66 percent in primary sector (agriculture, animal husbandry and allied), 45.72 percent are in secondary sector and 21.62 percent in tertiary sector (service, business etc.). As most of the women in rural areas are deprived of the land rights, table 1 shows that agricultural schemes are mostly not endowed to women. In the eyes of banks, women are not eligible for such schemes because either they have no land in their own name or they have no joint title to the lands. Even in case of animal husbandry schemes, women are not considered adequately though in reality they have to bear the burden of caring for domestics. Deprivation form land rights actually debar them from getting the benefit of these schemes. For getting these schemes, right to at least homestead is necessary. In the secondary sector, women are abundantly given village industries schemes which require very small working capital – some of the schemes are rice-pounding, basket making, broomstick making, puffed rice making etc. These schemes do not ask for any skill and women in general are well conversed with the process of making finished products. Illiterate women were mostly provided with these schemes and with increase in literacy level women generally did not favour these schemes (table 1). In tertiary sector, literate women preferred tailoring and knitting schemes (table 1) because these schemes require acquisition of some skills.

From this concurrent evaluation report, the endowment of low value schemes to the scheduled castes and scheduled tribes also is reflected. A distribution of SC/ ST beneficiaries vis-à-vis all beneficiaries corroborate this apprehension.

The distribution of the beneficiaries shows that in the lowest range of financial assistance (subsidy and bank credit) there are more beneficiaries from the scheduled tribe categories. The direct effect of low

financial assistance can be visible in less number of SC and ST beneficiaries, crossing the below poverty line cut off mark of Rs. 11,000/- per annum. For example, in case of SC beneficiaries, only 39.12 percent became able to cross the poverty line of Rs. 11,000/- per annum as against the overall figure of 46.34 percent (Fifth Concurrent Evaluation of IRDP). The corresponding figure of ST beneficiaries is 33.65 percent. Low financial assistance per family led to low-income generation from the scheme(s) which made them unable to topple the hurdle of poverty line. Along with this low assistance level, there was huge illiteracy among SCs and STs which for obvious reason made them dependent on others for getting IRDP assistance. In case of SC families, the illiteracy rate was 56.81 percent and for ST it was 60.57 percent as against overall illiteracy rate of 46.82 percent (ibid). This massive illiteracy among the SCs and STs was a pertinent cause for not being able to bargain for them and to make organisations in their own interests.

Skill development of the poor rural youths was also an important component of poverty alleviation strategies. For this purpose, a programme in the name of TRYSEM was launched in 1979. This programme took a concrete shape since the Sixth Plan when it was integrated as a facilitating component of IRDP. This training programme aimed at providing technical and entrepreneurial skills to the rural youths for enabling them to take up self-employment ventures or to get them engaged in wage employment. The wage employment provision was included in the programme since 1987 for broad basing the programme coverage. Like IRDP, in TRYSEM also it was stipulated that 30 percent of the trained youths should be from SC/ ST families living below the poverty line. The State-wise coverage of SC/ ST youths in this skill development programme was given in table 1 for the period Seventh Plan to the first two years of the Ninth Plan. Like IRDP, this programme also ceased to exist from April, 1999. All were merged in SGSY.

Table 1 : Coverage of SC/ ST Youths under TRYSEM (Per cent)

State	Seventh Plan	Eighth Plan	Ninth Plan	Performance Index	Rank
Andhra Pradesh	51.31	59.76	54.16	0.746	6
Assam	34.03	36.34	68.94	0.060	15
Bihar	41.96	45.41	63.14	0.542	10
Gujarat	41.10	56.27	72.55	0.550	9
Haryana	35.26	46.78	54.94	0.592	8
Karnataka	30.08	37.26	53.96	0.122	14
Kerala	34.56	42.29	45.73	0.299	12
Madhya Pradesh	53.47	52.20	49.12	0.942	1
Maharashtra	40.84	39.94	26.98	0.317	11
Orissa	47.94	51.90	67.51	0.837	3
Punjab	52.45	59.43	68.64	0.858	2
Rajasthan	49.29	52.60	74.29	0.813	4
Tamil Nadu	44.85	45.41	44.27	0.614	7
Uttar Pradesh	37.75	48.26	45.82	0.812	5
West Bengal	30.78	32.17	66.96	0.284	13
All India	42.37	45.86	66.07	-	-

Source : Annual Report of Ministry of Rural Development, Govt. of India for different years.

Notes : (i) All coverage figures are in percentages.
(ii) Performance index is calculated using dimension index formula as it is done earlier in this section for IRDP.

From table 1 it can be seen that the coverage of SCs/ STs during the Seventh Five Year Plan was quite in tune with the stipulated minimum prescribed by MORD, Govt. of India. In course of reviewing Sixth Plan achievement in TRYSEM, the Seventh Plan document noted that "against the target of 10.05 lakh youths to be trained during the Sixth Plan, 9.4 lakh youths were actually trained ..... members of SC and ST accounted for 31.5 percent of the persons trained". According to the revised yardstick to extend the coverage of SC/ ST to 50 percent, during the Eighth Plan, only 6 states became able to give more than 50 percent coverage of SCs/ STs. Ranking of the States on the basis of performance index shows lower rank for West Bengal, Karnataka and Kerala.

The Sixth Five Year Plan also launched wage employment programmes to generate supplementary employment opportunities for the rural poor and creation of durable assets for the community in the rural areas. For example, National Rural Employment Programme (NREP) was launched in 1980 as a centrally sponsored scheme on 50:50 costs sharing basis between the Centre and States. In NREP, no separate data were maintained for reflecting the benefits to the scheduled castes and scheduled tribes. The Seventh Five Year Plan document pointed out this shortfall at the time of reviewing the programme performance during the Sixth Plan: "it is not known as to how much of this (i.e. programme benefits) has been directed towards those who are landless and the poorest among the poor ..... . To this extent the programme has apparently lacked a direct focus on the target group population, for whom it was meant". During the Sixth Five Year Plan, another wage employment programme was launched from 15th August, 1983 for supplementing existing NREP. This programme was named as Rural Landless Employment Guarantee Programme (RLEGP) where an assurance of employment up to 100 days to at least one member of every landless household was given. Here also, no separate break up of SC and ST was given regarding their benefits. As the state specific figures for landless people are not available we use below poverty line population in 1987-88 for this purpose. Dividing below poverty line population by 5, the number of BPL households is calculated for the major states. The Planning Commission, Govt. of India derived the estimates of BPL persons by using the poverty line of Rs. 49.09 per capita per month at 1973-74 prices corresponding to daily calorie requirement of 2400 calorie per person in the rural areas. Here, 1983-84 estimates are not considered because it is within Sixth Plan period. If the employment generation in million mandays be converted into million man years by assuming 180 days work as work for the whole year, it can be seen that total employment generation in RLEGP during Seventh Five Year Plan was 6.41 million man years. Compared to the size of the total number of households below poverty line of slightly over 39.19 million, this employment was only 16.36 percent. This indicates the inadequacy of the programme in tackling the unemployment problem in the rural areas. Calculation of mandays generated per BPL family through this programme stands at 29.45 man days only .The highest number of days is found to be in Kerala followed by Tamil Nadu. State wise calculation helps to find out the variations across the states. According to the criterion of per BPL family employment generation, Kerala was the highest state with 46.89 days and Assam was the lowest state with 12.27 days. Thus in Assam, per BPL family employment generation was around 74 percent less than Kerala.

NREP and RLEGP were merged into Jawahar Rozgar Yojana (JRY) with effect from I[st] April, 1989 (the last year of the Seventh Five Year Plan). Like NREP and RLEGP, JRY was also a centrally sponsored programme with 80 percent contribution from the Government of India and 20 percent from the States. The primary objective of the programme was to generate additional gainful employment for the unemployed and under-employed persons in the rural areas. The secondary objective of the programme included creation of assets in favour of rural poor particularly SCs and STs for their direct and continuing benefits. The Manual of the programme published by MORD, Govt. of India (1994) earmarked resources for the benefit of SCs/ STs : "there will be no sectoral earmarking of resources at the village panchayat level except that 22.5% of the annual allocation must be spent on items of works which directly benefit the SCs/ STs". From April 1, 1999, a new programme was introduced in the name of Jawahar Gram Samriddhi Yojana (JGSY) where main focus was shifted to creation of durable assets in the rural areas instead of generating employment for the rural poor on priority basis.

Performance of JRY revealed that it was never possible to achieve full utilisation of available fund during its tenure. Except in the year 1995-96, in every year the share of women in total employment generated was less than 30 percent. This reflects the attitude of the implementing agencies towards women development. Low coverage of women was also captured in the two rounds of concurrent evaluation of JRY conducted by the Ministry of Rural Development (MORD) in Govt. of India. The first round was held during January-December 1992 and the second round during June 1993 to May 1994. The first round evaluation found women share in total employment generated at 20.02 percent. While in the second round, women share was found to be 16.59 percent. According to second round survey the states where the share of women in employment generation was less than all India level were Arunachal Pradesh (10.91%), Assam (5.94%), Bihar (7.53%), Haryana (5.08%), Himachal Pradesh (11.79%), Jammu and Kashmir (3.52%), Karnataka (15.5%), Manipur (16.03%), Meghalaya (12.40%), Mizoram (13.05%), Nagaland (9.59%), Punjab (0.48%), Sikkim (13.25%), Tripura (8.50%), Uttar Pradesh (7.22%) and West Bengal (13.05%). Similar observation was made in a Quick Evaluation Study of Jawahar Rozgar Yojana (in 2000) sponsored by MORD in Govt. of India :

"Women were not provided employment opportunities to the extent of 30 percent in many states and union territories. Specifically mention may be made for the gram panchayats in the states of Assam, Bihar, Jammu and Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Nagaland, Punjab, Tamil Nadu, Uttar Pradesh and Laksha Dweep ..... it is felt that specific programme strategies will have to be formulated for increasing the employment of women in JRY works".

Regarding the share of SC/ST in total employment generated it was 54 percent in the first round survey and 47.16 percent in second round. According to second round report, the States where the share of SC/ST in total employment generated was less than all India level were Andhra Pradesh (36.02%), Goa (14.62%), Gujarat (34.26%), Haryana (41.24%), Karnataka (42.65%), Maharashtra (42.69%), Manipur (38.18%), Orissa (43.90%), Punjab (46.33%), Tamil Nadu (37.55%), Tripura (32.78%) and West Bengal (43.55%). As from the year 1998-99, JRY was restructured to launch JGSY, in Ninth Five Year Plan JRY continued for the first two years only.

30 percent share of women in total employment generation under JRY could not be ensured in most of the years of implementation of the programme. The practice of data maintenance in JRY did not facilitate

the assessment of the 'number of workers who have actually received employment in the rural areas and on an average for how many days' (Ninth Five Year Plan, Vol. II). According to Mid Term Appraisal of Ninth Five Year Plan, employment generated per person was too inadequate to bring about any meaningful increase in the earnings of the beneficiaries. Referring the second round concurrent evaluation report, the Mid Term Appraisal made following comments :

"According to a concurrent evaluation carried out by the Ministry of Rural Development during June 1993 – May 1994, roughly 11 days of employment was generated per person. At this level, the programme could not have made any significant impact on the income levels of the beneficiaries. It fell far short of the need to create enough employment in the rural areas to remove unemployment/ under employment."

In spite of many lacunae in this programme, during its tenure two positive things happened. One is creation of durable community assets in the rural areas and second is empowerment of the panchayats as in most of the states the programme was implemented through the panchayats.

For augmenting the scope of employment opportunities in favour of the rural poor, during the Eighth Plan, a wage employment programme was introduced since Gandhi Jayanti Day on October 2, 1993. This programme was in addition to the existing JRY. As this new programme contained an assurance of 100 days of employment to able-bodied persons in the rural areas, it was given the name of Employment Assurance Scheme (EAS). The primary objective was to provide gainful employment in manual work during lean agricultural season provided the people were in need and desirous of work, but could not find it. EAS also was a centrally sponsored scheme where the costs were shared by the Centre and States in the ratio of 75:25. The secondary objective was the creation of economic infrastructure and community assets for sustained employment and development of the poor. Initially, the scheme was introduced in 1778 blocks of 261 districts where Revamped Public Distribution System was in operation. By the end of the year 1997-98, all 5448 blocks of the country were brought under this wage employment programme. Assurance of providing 100 days of employment in a year, however, could not be kept. According to the Report of Planning Commission, it was possible to generate only 31 days of employment per year. The Mid term Appraisal of the Ninth Five Year Plan mentioned lower employment generation per person than the Task Force – on an average it was 18 days in 1994-95 and 16 days in 1995-96.

On an average at all India level around 11 and 6 days of employment could be generated for the poor families during 1999-2000 and 2000-2001 resepectively. Employment generation is very low in the states like West Bengal, Bihar, Uttar Pradesh, Assam and Madhya Pradesh. At the instance of the Planning Commission, Programme Evaluation Organisation (PEO) undertook an evaluation study on EAS (Report published in April, 2000). Regarding employment generation in the programme, the observation of PEO is worth quoting here :

"The information gathered from the beneficiaries of EAS reveals that about 69 percent of the beneficiaries got less than 30 days of employment in a year, and another 17% got employment between 30 and 50 days. The overall average for the 14 states works out to 31 days/year. The high rates of employment generation as reported in official statistics, are not supported by the information obtained from the beneficiaries. In particular, the figures on employment for two states viz. Tamil Nadu and Uttar

Pradesh do not appear to be in tune with the grassroots level situation".

Fourteen states considered by PEO were Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. The Mid term Appraisal of Ninth Five Year Plan also expressed the dissatisfaction over EAS in respect of employment generation for the poor :

"..... EAS has not realised its objectives of generation of sustained and gainful employment, supplementing the income of rural wage-earning class in agricultural lean seasons and improving the well being of rural poor. With universalisation of EAS and without an element of assurance of employment of 100 days in a year as initially envisaged, there is practically no difference between JGSY and EAS except that the former is being implemented through PRIs and the latter by the administrative apparatus. There is, therefore, need to have another look at EAS".

Ultimately, with effect from 25th September 2001, EAS and JGSY were merged into one single rural wage employment programme named as Sampoorna Gramin Rozgar Yojana (SGRY). Women coverage of even 30 percent could not be achieved in this programme. Women coverage crossed 30 percent mark only in four years out of nine years of implementation. For example, in the year 1994-95 it was 30.87 percent which means coverage was just 2.90 percent more than 30 percent.

The main emphasis of JGSY was to create rural infrastructure at the village level and the implementation of the programme was solely placed in the hands of the village panchayats. For protecting the interests of women, the programme guidelines stipulated the reservation of 30 percent of the employment opportunities in favour of women. For SC/ST population, JGSY has the provision of earmarking of 22.5 percent of annual allocation for individual beneficiary schemes of SC/ST families living below the poverty line. Importance was always specified to give preference to SC/ST population in getting employment opportunities under the programme. This programme continued from 1st April, 1999 to 25th September 2001 when it was merged with EAS to lead to a new programme known as SGRY. In 1999-2000, of total funds available 72.80 percent were utilised and in 2000-2001, this utilisation percentage was 93.86 percent (Annual Report 2001-2002 of MORD, Govt. of India). The women coverage in total employment generation of 2683.17 lakh man days was 27.79 percent in 2000-2001. In contrast to the earlier wage employment programmes, "physical progress is monitored in terms of number of works completed and taken up in place of man days generation, as JGSY has now become an infrastructure development programme as compared to generation of wage employment" (Annual Report, 2000-2001 of MORD, Govt. of India). The immediate evidence of lowering the thrust on employment generation in JGSY can be realised if we have a look at employment generation in JRY. In JRY, it never went below 37 crore mandays in a year while JGSY generated on an average 27 crore man days in year. This substantial drop in employment generation is a serious matter of concern. In view of Tenth Five Year Plan, "in effect, panchayats are left with very little money to take up meaningful infrastructure projects". With the launching of SGRY, food and nutrition security to the poor was brought in within the objective framework of the programme along with generation of wage employment and creation of durable economic infrastructure in the rural areas. The programme is being implemented as a centrally sponsored scheme on cost sharing basis between the Centre and the States in the ratio of 75:25 of the cash component where food grains would be provided free of cost to the states. From the Annual Report, 2002-03 of MORD,

Govt. of India, it can be seen that only 69.92 percent of total available fund could be utilised in 2001-02 including expenditure on EAS. SGRY specified two streams of implementation of the programme. The first stream is being implemented at the district and intermediate panchayat levels whereas the second stream is being implemented at the village panchayat level. Financial performance reports of MORD, Govt. of India for the year 2002-03 and 2003-04 show that in first stream, percentage of utilisation of available fund is 76.47 percent and in second stream it is 79.55 percent; and 61.69 percent in first stream and 64.14 percent in second stream respectively. The stream wise shares of SC/ST and women in employment generation in 2002-03 and 2003-04 are given below :

	2002-03		2003-04	
Category	1st Stream	2nd Stream	1st Stream	2nd Stream
Scheduled castes	34.12%	36.45%	31.02%	30.44%
Scheduled tribes	20.54%	19.73%	24.73%	27.38%
Women	26.84%	25.35%	26.76%	24.10%

The employment generation in SGRY (taking both the streams together) in 2002-03 and 2003-04 are respectively around 75 crores and 63 crores. This employment generation is much less than EAS and JRY taken together. Continuous experimentation with the names of the programmes and shifting of thrust areas, in fact, hamper the employment generation possibilities through government sponsored programmes. Less generation of employment only affects the interests of the poor who are the main target groups.

Integrated Rural Development Programme in West Bengal commenced its journey in all the blocks since October 2, 1980. Before that, IRDP was launched in 230 blocks of the State in the year 1978-79. From the very beginning of the programme, the State Government involved all three tiers of the panchayat structure (gram panchayats, panchayat samiti and zilla parishad), district administration and banking institutions for its implementation. The networking among all these agencies can be best described by quoting from an official report (1988) :

"Gram panchayats have been entrusted with selection of beneficiaries and sponsoring of cases. Panchayat samitis have been vested with powers of sanction of IRDP loans. To monitor the programme effectively at the block level, a block level IRDP sub committee has been set up. This consists of the Sabhapati (chairperson of Panchayat Samiti),BDO and other relevant officials, all bankers at the block level and Gram Panchayat Prodhans (Chairperson of village panchayat) as invitees ..... . A district level agency called the District Rural Development Agency was set up in all the districts in 1981-82 ..... All funds were channelised through DRDAs which were also the nodal agencies for monitoring and supervising the work of IRDP. In DRDAs, Sabhadhipatis of Zilla Parishads were made chairmen and District Magistrates, vice-chairmen. This enabled the State Government to involve the PR bodies and the district administration more effectively".

Thus, the success or failure of this programme largely depends on the performance of the panchayats, particularly at the village and block levels. Regarding coverage of women in the programme, the State most often failed to reach the target of 30 percent coverage during the Seventh Plan and 40 percent coverage since the Eighth Plan till its termination by the end of the year 1998-99. During nineteen

years of implementation of the programme, in West Bengal 33,57,164 families were assisted – out of this 891038 were women. In percentage, the coverage of women thus stood at 26.54 percent only. Again of the total women assisted, majority belonged to non-scheduled caste/ scheduled tribe families. Socio-economically, in general, SC/ ST women are in worse off situation than non SC/ ST women. For example, during 1990-91 to 1998-99, total women assisted were 5,14,002 – out of them only 1,92,770 were from SC/ ST communities. In percentage, 37.50 percent of total assistance to women went to SC/ ST women and the rest to other women. This information was not available for the period prior to 1990-91 as no categorization of women beneficiaries was made.

Turning to quality of assistance, per family investment for scheduled castes, scheduled tribes and all other families are calculated. The per family investment is an important yardstick to ensure crossing of the poverty line. The Expert Committee on Integrated Rural Development Programme constituted by the Reserve Bank of India on 29th September, 1993 made observation that "very often, the activities under IRDP fail to generate substantial incremental income" due to low investments. The observations of the Committee include the following remarks :

"The level of income generation from any economic activity, inter alia, depends on quantum of investment made. The experience suggests that the level of investment for each family/ enterprise under IRDP has been rather low, over the years.... Using the stipulated incremental capital-output ratio of 2.75, schemes of investment ranging from Rs. 5,800 to Rs. 7,600 can generate incremental income between Rs. 2,100 to Rs. 2,800 only; schemes with investments between Rs. 3,400 to Rs. 4,500 can generate incremental income between Rs. 1,500 and Rs. 1,700 only..... Needless to say, with an incremental income of Rs. 2,800 per year i.e. monthly of Rs. 240, the poor will not be in a position to cross the poverty line, especially, when most of the IRDP beneficiaries do not have any other occupation, main or subsidiary...."

With continuous thrust for enhancing per family financial assistance, during the closing years of the programme it became possible to raise it above ten thousand rupees. But it was not possible to rub off the discrimination against SC and ST communities. Table 2 is constructed to present this phenomenon. In spite of repeated directions from the State level to extend assistance according to the need of the families for generation of sufficient income from the schemes, the grass root delivery system rarely acted in accordance with letter and spirit.

Table 2 A Comparative View of Per Family Investment in West Bengal, 1990-91 to 1998-99

Year	Overall per family investment (in Rupees)	SC per family investment (in Rupees)	ST per family investment (in Rupees)	Less by from overall (in %)	
				SC	ST
1990-1991	7079	6305	6947	10.93	1.86
1991-1992	7644	7207	7329	5.72	4.12
1992-1993	7996	7102	7176	11.18	10.25
1993-1994	8255	7415	7439	10.17	9.88
1994-1995	8187	7584	7630	7.36	6.80
1995-1996	9454	8003	8687	15.35	8.11
1996-1997	11823	10630	10720	10.09	9.33
1997-1998	12248	10415	10521	14.96	14.10
1998-1999	13527	11417	11262	15.60	16.74

Source : Department of Panchayats and Rural Development, Govt. of West Bengal.

Table 2 shows that per family investment for ST families was less than overall per family investment in each and every year of 1990s. Per family investment in case of general caste families was always high. Though the village panchayats and intermediate panchayats were entrusted with the implementation of this programme, the interests of the poor scheduled castes and tribes in getting sufficient benefits from this programme seemed to be not adequately protected. For making the panchayats broad-based in tune with the Constitution (Seventy Third Amendment) Act, 1992, the Government of West Bengal through an amendment of the West Bengal Panchayat Act made it obligatory to reserve seats for scheduled castes and scheduled tribes in all three tiers on the basis of their proportion in total population of the respective tier. As a consequence large number of men and women from SC/ST communities got the opportunity to enter these institutions and local decision making platforms. In spite of spate in the number of panchayat representatives from the disadvantaged sections of the society, they are yet to garner the benefits of development. The recent estimate in West Bengal (2002) shows that the proportions of scheduled castes and scheduled tribes below poverty line are 44.31 percent and 43.07 percent respectively.

As in other parts of the country, since the Sixth Plan, TRYSEM programme was also started in West Bengal as an integral component of IRDP. In this programme also the gram panchayat was given the responsibility to identify the rural youths living below poverty line and the trade for which trainings could be organised. The main objective of the programme was to provide new skill or augmentation of the existing skill of the rural youths for settlement in self or wage employment. This would generate income for them to sustain their families and to go beyond the poverty barriers. However, no district wise data were available prior to 1989-90 for making assessment of the programme in this respect. From 1990-91, data regarding employment (self and wage) of trained youths are available which shows settlement of around 60 to 65 percent trained youths. Here also no SC, ST and women classification of settled youths were made. This restricts us to make further exploration regarding employment of marginalized sections from this scheme. During the period 1990-91 to 1998-99 which happened to be the last year of this programme, in West Bengal the amount of Rs. 3763.14 lakhs was spent for providing training to 148345 youths – per capita expense is thus Rs. 2536 only which includes stipend of the trainee, honorarium for

the trainer, tool kits and raw material costs. Of the total youths trained, 69925 are self employed and 23650 are wage employed – total employed thus becomes 93575 which is 63.08 percent of total trained. This indicates that about 37 percent of the total funds spent were simply not utilised for the purpose as the basic objective of the programme is that after the training, the trained youths should be settled in employment and use their skills endowed or augmented for earning income. The Mid term Appraisal of Ninth plan also made similar observation (to quote): "The rural youths so trained were only interested in the stipends; they had not used the knowledge gained under the programme for furthering self employment prospects". In addition to this weakness, TRYSEM had a weak link with IRDP also. West Bengal data from the year 1992-93 to 1998-99 corroborate this contention (table 3(a)).

Table 3(a) : Number of Trained Youths Provided Assistance Under IRDP in West Bengal, 1992-93 to 1998-99

Year	No. of youths trained	No. of youths provided IRDP assistance in activity of training	No. of youths provided IRDP assistance not in activity of training	Total no. of trained youths provided IRDP assistance
1992-93	15223	7838 (51.49)	488 (3.20)	8326 (54.69)
1993-94	17421	5525 (31.71)	287 (1.65)	5812 (33.36)
1994-95	20711	6017 (29.05)	133 (0.64)	6150 (29.69)
1995-96	22557	6025 (26.71)	135 (0.60)	6160 (27.31)
1996-97	24269	4618 (19.03)	142 (0.58)	4760 (19.61)
1997-98	19970	2835 (14.20)	104 (0.52)	2939 (14.72)
1998-99	12673	2099 (16.56)	64 (0.51)	2163 (17.07)

Source : Department of Panchayats and Rural Development, Govt. of W.B.
Note : Percentage figures in brackets.

From table 3(a), it can be seen that there are cases where trained youths were provided assistance under IRDP in the schemes for which they were not trained – this is a dangerous trend as the training expenses were totally mis-utilized on one hand and IRDP subsidies were grabbed on the other hand. As the gram panchayats and panchayat samitis have the sole authority to recommend for IRDP assistance, responsibility for such inappropriate action devolves upon them. In reality the panchayats want to maintain different sets of beneficiaries for different programmes – they rarely take care in convergence (obviously there may be exceptions, but those are very much numbered). In table 3(b), percentage of trained youths settled in employment (both wage and self) during the period 1990-91 to 1998-1999 are given.

Table 3(b) : Percentage of Trained Youths Employed in West Bengal, 1990-91 to 1996-99

Year	Total no. of youths trained	No. of trained youth South self employed	No. of trained youths wage employed	Total no. of youths employed
1990-91	14916	8095 (54.27)	2183 (14.63)	10278 (68.90)
1991-92	17828	10023 (56.22)	2948 (16.53)	12971 (72.76)
1992-93	15223	8911 (58.53)	4692 (30.82)	13603 (89.36)
1993-94	17421	6439 (36.96)	2213 (12.70)	8652 (49.66)
1994-95	20711	7203 (34.78)	2819 (13.61)	10022 (48.39)
1995-96	22557	8080 (35.82)	2162 (9.58)	10242 (45.40)
1996-97	24269	8420 (34.69)	3090 (12.73)	11510 (47.42)
1997-98	19970	7192 (36.01)	2342 (11.73)	9534 (47.74)
1998-99	12673	5562 (43.89)	1201 (9.47)	6763 (53.36)
Total	165568	69925 (42.23)	23650 (14.28)	93575 (56.51)

Source : Department of Panchayats and Rural Development, Govt. of W.B.
Note : Figures within brackets are in percentage.

The main reason for low settlement of the youths in employment is that each constituent agency of the delivery system, e.g. gram panchayat, panchayat samiti, block officials, extension agencies and banks are satisfied with completion of its own assigned task, but not in overall convergence of the process. As a consequence, the ultimate objective of the programme remains unachieved.

From April 1, 1999 SGSY started with the merger of IRDP and its allied programmes. SGSY is conceived as a holistic programme covering all aspects of self employment namely, training, technology transfer, provision of infrastructure, availability of credit, organization of the poor into self help groups, marketing etc. Like its predecessor, SGSY is also a credit-cum-subsidy programme. The only difference is that in SGSY, credit is a critical component and subsidy being a minor and enabling component. Both individual and group approaches are incorporated in programme implementation strategy. In case of self-help groups, no specific proportion is prescribed for preserving the interests of the scheduled castes or scheduled tribes. Only it is mentioned that 50 percent of the groups formed in each block should be exclusively reserved for women. However, for individual benefits, the guidelines of the programme specify safeguards for the weaker sections. For example, SCs/ STs will have a share of minimum 50 percent, women 40 percent and disabled 3 percent of the total individuals (known as Swarozgaris in SGSY) assisted during a year. From available data, share of SCs and STs in SHGs cannot be assessed. In case of individual

beneficiaries, the coverage figure of SCs and STs are maintained at every stage of implementation of this programme. At the macro level in West Bengal it was never possible to go beyond 50 percent coverage for SCs/ STs as stipulated in the guidelines. The following statement is given as a proof :

Year	No. of Swarozgaris	SC	ST
1999-2000	75981	22836 (30.05)	4228 (5.56)
2000-2001	7351	3053 (41.53)	444 (6.04)
2001-2002	15480	3969 (25.64)	427 (2.76)
2002-2003	28748	6643 (23.10)	844 (2.93)
2003-2004	27198	6005 (22.08)	869 (3.19)

Source : Department of Panchayats and Rural Development, Govt. of West Bengal.
Note : Figures in brackets are in percentage.

The guidelines of the programme bestowed the authority of identification and selection of individual Swarozgaris on the village panchayats and the intermediate panchayats. Preferably, the selection of individuals for assistance under the programme is to be made in the meeting of gram sansad (village constituency) in West Bengal where maximum participation of people, in particular the poor becomes possible. Otherwise, a three-member team consisting of the representative of BDO, gram panchayat prodhan and the bank representative would identify the individual for assistance. The village panchayats, in fact have the immense role to extend the benefits to the weaker communities in the rural areas. SGSY has just started to work for the poor. Though quality is accepted as the hallmark of the programme, yet it is not sure whether it will carry the vices of IRDP.

Along with the self-employment programmes, for generation of additional employment in the rural areas, wage employment programmes also become an important component in the strategy of poverty alleviation. Like implementation of IRDP and TRYSEM, in Jawahar Rozgar Yojana implementation was made through all three tiers of the panchayat structure. According to the guidelines of this programme, the available funds for implementation of JRY were distributed in the ratio of 15:15:70 among zilla Parishads, panchayat samitis and gram panchayats respectively. Therefore, the performance of the programme heavily depends on the performance of gram panchayats in particular. The data set available from the Department of Panchayats and Rural Development, Govt. of West Bengal amply demonstrates the low level utilization of the available funds.

Of ten years of the duration, only in the years 1993-94 and 1994-95 it was possible to utilize more than 85 percent of the available funds in the programme. The Manual of the programme published in 1994 incorporated the following provision regarding the release of funds from the Govt. of India :

"the opening balance in the district i.e. the aggregate of balance with DRDA/ Zilla Parishad and village panchayats should not exceed 15 percent of the district allocation during the previous year. In case, the opening balance exceeds this limit, the central share of the excess will be deducted at the time of release of second installment".

This provision indicated cut in admissible funds in case of low utilization of funds. Except the years 1993-94 and 1994-95, each of the eight years had to face cut in Govt. of India funds due to heavy unspent balance at the end of the financial years. This simply jeopardized the interests of the poor, in particular those in the bottom layer of the poverty strata. This layer is mainly crowded by the families belonging to scheduled castes and scheduled tribe families. There are many reasons for such low utilization of funds – these calls for further explorations. The prominent reasons might be inability of the panchayat bodies to reach decisions in respect of finalization of the schemes to be taken up, prioritization of the schemes, late arrival of funds (in general during the closing months of a financial year) etc.

For safeguarding the interest of the marginalized sections, the Manual of JRY specifically mentioned that in respect of employment generation, adequate preference was to be given to the scheduled castes and scheduled tribes and 30 percent of the employment opportunities would be reserved for women. From the available data, it can be understood that within the span of ten years of implementation, in JRY it was possible to achieve 30 percent coverage of women in the years 1990-91 (31.19%), 1992-93(30%) and in 1993-94 (30.17%). In West Bengal, reservation of one third of total seats in all three tiers of the panchayats was made since the fourth panchayat general election in 1993. As a result large number of women in the rural areas got the opportunity to come into the local decision making platforms. In the fifth panchayat general election (1998), in conformity with 73rd Amendment of the Constitution, offices of the panchayats in three tiers were reserved for women. It is expected that women emerging as members/ office bearers in the panchayat bodies would have contributory effects to protect the interests of the local women in respect of getting the benefits of different government sponsored programmes.

In West Bengal, EAS was initially started in 128 blocks out of total 341 in the State. Expansion was in phased manner and in the year 1997-98 all blocks of the State were brought under the programme in tune with universalisation of the programme throughout the country. For this reason, in this study we consider the period 1997-98 to 2001-02. EAS was initially conceived as a demand driven programme, but with restructuring of this programme with effect from 1st April, 1999, specific targets of employment generation for the districts were made. This restructuring practically diluted the assurance of 100 days employment in a year per BPL household. In West Bengal, it was never possible to reach at least 80 percent expenditure level during nine years of implementation of this programme.

Both in JRY and EAS, fund utilisation is not high in spite of involvement of the panchayat institutions in planning and execution of the works. Due to low utilisation of available funds, the demand for further allocation did not arise. Regarding the nature of works that could be taken up, the programme guidelines gave priority to schemes like soil and moisture conservation, minor irrigation, rejuvenation of drinking water sources, rural roads, drainage and forestry in community land. In course of restructuring the programme, it was stipulated that 70 percent of the district allocation would be earmarked for the intermediate tier of the panchayat structure. The remaining 30 percent could be utilised by the district tier. The success or failure of EAS, thus, depends heavily upon the activities of higher two tiers of the panchayat set up.

Employment Assurance Scheme is a programme to guarantee employment of 100 days to a household below poverty line. On this count, the performance of the programme in West Bengal was not encouraging. During its implementation the programme was able to generate slightly more than 2 days

of employment in a year for the below poverty line families. Due to lacunae in the data management system, the number of days of employment available to SC, ST and women cannot be assessed. By using the district wise number of below poverty line families and employment generated in EAS during a year, per family availability of employment is assessed for each of 17 districts of the state (erstwhile Midnapore is considered). In 1997-98 only 2.84 days employment was available per family. For the remaining years till the merger of the programme, employment availability per family was 2.16 days in 1998-99, 2.58 days in 1999-2000, 2.34 days in 2000-2001 and 1.71 days in the year 2001-2002. The district wise estimates of below poverty line families determined by the Department of Panchayats and Rural Development, Govt. of West Bengal in 1997-98 are used here. These estimates remain valid for the next five years. Normally, before the beginning of a plan period, through household survey number of below poverty line families are determined for assistance in different poverty alleviation programmes. In EAS guidelines there are the provisions to register the name of the persons seeking employment. Even if we go by the number of persons registered and calculate the employment availability per family, the same scene repeated. For example, according to this standard, per family employment was 6.74 days in 1994-95, 5.22 days in 1995-96, 5.94 days in 1996-97, 5.09 days in 1997-98, 3.84 days in 1998-99, 4.63 days in 1999-2000, 4.20 days in 2000-2001 and 3.07 days in 2001-2002. In maintaining the registers for the persons seeking employment, no caste-tribe categorization was made.

There are districts where even 1 day of employment could not be generated for the poor families. These results lead us to conclude that the assurance of 100 days of employment in a year is a total hoax and a political gimmick.

The Sampoorna Gramin Rozgar Yojana (SGRY) has the objectives to provide additional wage employment in the rural areas as also food security, alongside the creation of durable community, social and economic infrastructure in the rural areas. The programme is self-targeting in nature with special emphasis to provide employment to scheduled castes, schedules tribes, women and the parents of children withdrawn from hazardous occupations. The shares of respective categories in total employment generation are given below :

Category	2002 – 03		2003 – 04	
	Stream I	Stream II	Stream I	Stream II
Scheduled Caste	38.92 %	45.62 %	39.22 %	46.06 %
Scheduled Tribe	15.96 %	13.51 %	17.22 %	13.75 %
Women	21.17 %	19.35 %	21.26 %	20.11 %

Source : Dept. of Panchayats & Rural Development, Govt. of West Bengal.

From the respective shares of the marginalised sections, it can be seen that women are not getting their due share. In spite of large number of women in all three tiers of the panchayats, the women's share duly specified in the programme guidelines could not be ensured. The development facilitators (both the government officials and the panchayat representatives) in lower echelon of the administrative pyramid often have awareness gap in the matter of different provisions incorporated in the manual / guideline. This implementational lapse often bereft the marginalised people of their due benefits. Stream I of SGRY is implemented by the Zilla Parishad and Panchayat Samiti where the resources are shared in the ratio of 40:60. The Stream II is entirely implemented by the gram panchayats where 50 percent of the total

allocation under the programme is allotted. This programme has both cash and kind component in the wage. Food thus available as wage acts as food security to the poor families. The performance of the programme from the angle of receipt and expenditure does not show any major improvement in respect of expenditure made vis-à-vis available fund. In 2002-03, Stream I has the percentage expenditure of 57.32 percent as against 64.07 percent in 2003-04. Again in stream II, percentage of expenditure was 70.33 percent in 2002-03 and 73.69 percent in 2003-04. The differences show that at the gram panchayat level, utilisation of funds is better in comparison to district and block panchayats.

Discussions on the major poverty alleviation programmes show that in West Bengal, expenditure level in general did not reach a high level where Govt. of India can not impose any cut on the State's entitled fund. In case of West Bengal, Govt. of India had to impose cuts several times in several programmes. This is a weak area in the programme delivery system. The government officials in different tiers only act as the facilitators in the process of implementation of these programmes; the decision-making and identification of the projects and the beneficiaries are in the hands of the political executives. Any lag there has consequential reflection on low utilisation of fund, low employment generation and huge cash balance for the next financial year.

In West Bengal, the State Government executes all anti-poverty programmes with the active involvement of the panchayat bodies in three tiers. The administrative control of these programmes remains with the Department of Panchayats and Rural Development. The State Government functions mainly include allocation of funds to the districts after matching the State share with the Central share, issuing executive orders to district and sub-district level implementing agencies in conformity with the guidelines framed by the Govt. of India and sending utilization certificates to the Govt. of India in respect of the funds received. Very little attention was given to monitor the programmes like IRDP, TRYSEM, JRY or EAS. The traditional practice of monitoring is through pre-designed proforma reports generated from the block / district levels. Like the concurrent evaluation of programmes undertaken by the Ministry of Rural Development, Govt. of India, at the State level there was no such venture. Till now, no concerted State initiatives are there to organise such concurrent evaluation for the massive programmes like SGSY or SGRY. At the zilla parishad and panchayat samiti there is a standing committee respectively in the name of Artho-Sanstha, Unnayan-O-Parikalpana (Finance, Establishment, Development and Planning) for doing monitoring / evaluation of the on-going poverty alleviation programmes implemented by them. Rarely these are pursued.

In addition to the standing committees, according to the provisions of West Bengal Panchayat Act, 1973 (with subsequent modifications), under section 16A. Gram Sansad has been constituted in each and every gram panchayat for effective participation of people in the affairs of the gram panchayats. The sub-section 6 of the Section 16A clearly lays down that a Gram Sansad shall guide and advise the gram panchayat with regard to the schemes for economic development and social justice undertaken or proposed to be undertaken in its area and identify or lay down principles for identification of the schemes which are required to be taken on priority basis for economic development of the village on one hand and beneficiaries for poverty alleviation programmes on the other hand. Additionally, in section 16B there lies the provision of Gram Sabha whose jurisdiction is coterminous with the area of Gram Panchayat. The information on attendance in these two public forums is not at all encouraging. People in general do not

feel it necessary and urgent to attend these meetings. In fact participation is a process and it blooms gradually and generates belongingness. It is not a physical ingredient so that when a clause is added to the guidelines of a programme its presence is ensured automatically. For achieving people's participation, political will is an essential force along with respect and accountability towards the people. Publication of the list of beneficiaries and statement of income-expenditure of respective schemes executed by the panchayats is a step towards social inspection and social audit. This is also sporadically adhered by the panchayats. All these ingredients of monitoring and evaluation of the programmes are very much missing in the agenda of the panchayats. As a consequence, all poverty alleviation programmes still remain as government directed programmes. With little intervention by the people in identification and prioritisation of the schemes, the programmes failed to become people's programmes for the people's benefits. However, for rejuvenating people's participation in the rural areas, the State Government amended the WBP Act in the year 2003 to create Gram Unnayan Samiti under each gram sansad of the gram panchayats. The Gram Unnayan Samitis are constituted for ensuring active participation of the people in implementation, maintenance and equitable distribution of the benefits with respect to different schemes / programmes implemented by the gram panchayats. Only the future can narrate the utility of such Unnayan Samitis.

3. Conclusions

So far as poverty alleviation programmes are concerned, their success depends on the effective delivery system and efficient implementation of the programmes at the grass root level so that the programme benefits can reach the rural poor without any transmission loss. Interventions in the nature of awareness building of the rural poor through IEC activities and capacity building of the implementing agencies (both officials and non-officials) nearer to the people are very urgent to enhance the effectiveness of the programmes. Since the Sixth Plan till the launching of the Tenth Plan many experiments were made with the poverty alleviation programmes with little or no alterations in the shares of the marginalised sections, in particular the poor rural women. For achieving economic empowerment for them, this requires correction. Their due shares could not be extended mostly on the ground of insensitivity towards them. The suggestion is that involvement of non-government organisations (NGOs) can bring some improvement. NGOs can extend their expertise in organisation of the poor, in building awareness of the prospective beneficiaries, in monitoring of the schemes – in a nutshell as a watch dog of the delivery mechanism. So far, the role of NGOs in anti-poverty programmes is very limited. Only in formation of SHGs under SGSY they are given some spaces. In IRDP or TRYSEM, they had practically no involvement at all. NGOs need space and for the benefit of the poor it should be allowed to them. Pro-active interfacing of the panchayats and NGOs may add strength to the delivery system – success in total sanitation campaign is a case for such hypothesis.

References :

1. Government of West Bengal, Department of Panchayats and Rural Development – Annual *Administrative Report of different years.*

2. Ministry of Rural Development, Govt. of India –

   (i) Fifth Round Concurrent Evaluation of IRDP, published in October, 1999

   (ii) Quick Evaluation Study of Jawahar Rozgar Yojana, 2000

3. Planning commission, Govt. of India –

   (i) Sixth Five Year Plan (1980-85)

   (ii) Eighth Five Year Plan (1992-97), Vol. II

   (iii) Ninth Five Year Plan (1997-2002), Vol. II

   (iv) Mid-term Appraisal of Ninth Five Year Plan

   (v) Tenth Five Year Plan (2002 - 07)

Determinants of Capacity Utilization in Individual Energy Intensive Industries : A Post-Liberalization Period Analysis on Indian Cement Industry

Sarbapriya Ray* Dr. Mihir Kumar Pal**

The present study attempts to analyze the nature of quantitative relationship between different industrial characteristics and capacity utilization using industry- level and company -wise time series data in the context of Indian Cement Industry during 1991 – 92 to 2004– 05.Applying a linear multiple regression model with time variable, it is evident that capacity utilization is positively related to demand pressure, Capital Intensity and market concentration variables and time has a very smaller (Significantly different from zero) effect on capacity utilization. But scale of operation variable represented by market share shows confusing and statistically insignificant result which is contrary to our hypothesis.

1. Introduction

In the context of judging industrial performance, capacity utilization (C U) is a crucial factor which explains changes in investment, inflation, long run output growth and level of resource utilization etc. In recent time, analysis of capacity utilization and its likely determinants have been gaining due importance in a 'capital scarce' underdeveloped economy like India. The effective utilization of capacity reflects and ensures balance in growth, quality management, appropriate administrative decision of government in allocation of foreign exchange and licensing of new investment.

It is well recognized that utilization of capacity reflects the influences of markets supply and demand conditions, government policies, the degree of monopolization within an industry and the attitude of the managers of the firms in under-developed countries (S. Paul 1974). Demand deficit, labour problem, transport bottlenecks, failure in power supply, mechanical/ maintenance trouble, strike etc are major causes responsible for underutilization of industrial capacity in India.

Apart from the above mentioned factors, industry characteristics like demand pressure, capital intensity, market concentration, scale of operation etc and policy variables influence capacity utilization rates of an industry. Paul (1974) found that industry characteristics explaining 40% of inter industry variation in CU rates and policy variables explaining 32% of the inter-industry variation comprise nearly 72% of the total inter-industry variations in CU.

In view of greater openness of the Indian economy due to trade liberalization, industrial licensing was abolished since 1991 and private sector can build and expand capacity without any regulation. The policy reforms have the objective to make Indian industry more efficient, technologically up-to date and competitive.

*Sr. Lecturer, Dept. of Commerce, Shyampur Siddheswari Mahavidyalaya, Howrah, West Bengal, India.
** Reader, Dept. of Economics, Vidyasagar University, Paschim Medenipur, West Bengal, India.

In this backdrop of more than one and half decades after these reforms, it is necessary to examine the factors that influence capacity utilization of an industry. In this study, we have attempted to explain the nature of relationship between capacity utilization and different industrial characteristics (excluding other explanatory policy variables like import substitution, effective rate of protection etc. due to unavailability of reliable, comparable data) based on industry level and company -wise time- series data in the context of Cement Industry in India.

The object of this paper is to analyze econometrically the effect of demand pressure, capital intensity, market concentration and scale of operation on capacity utilization. It employs multiple regression analysis technique (OLS) considering all explanatory variables in the same equation. Similar attempts were made earlier in the studies of S. Paul (1974), Srinivasan (1992) and Goldar and Renganathan (1991).

The methodological nicety of this study lies in the fact that studies attempted earlier on this issue (as mentioned before) incorporate CU data from various secondary sources, which seems to be mis-reported as well as exaggerated . We have used CU statistics calculated separately by ourselves employing minimum capital-output ratio method. Another drawback of earlier studies has been the examining of quantitative relationship of CU and other explanatory variables over a period of time without considering time variable which we have incorporated in our regression model to remove the effect of spurious correlation. Plan of the paper is as follows. Section II deals with conceptual study related to capacity, sources of data and scope of the study. Section III depicts a brief overview of the trend of Indian Cement Industry. Variables are defined in section IV. Model and Methodology are described in section V. Section VI discusses empirical result, and summary and conclusion are presented in Section VII.

2. Concept of Capacity

The concept of capacity has played an important role in economic analysis. Simply, capacity output is defined as the maximum feasible level of output of the firm. Klein (1960) defined capacity as the maximum sustainable level of output an industry can attain within a very short time, when not constrained by the demand for product and the industry is operating its existing stock of capital at its customary level of intensity. The definition of installed capacity used by the Indian government in collecting its statistics is not rigid; rather it comes closer to the engineering definition of capacity. Engineer's idea of capacity may differ from economist's idea because if certain volume of production is technically possible, it may not be economically desirable. Generally, engineering capacity refers to the maximum potential output per unit of time that a plant can produce under given processes and conditions and when there are no constraints on the flow of variable inputs and no cost consideration . But, operating manager's notion of installed capacity may differ, which assumes a variety of considerations such as number of shifts in work, quality of managerial staff, and availability of repair and replacement parts – all of which is supposed to modify the engineering estimation of plant capacity. Concept of installed capacity particularly is linked to the shift work decision problem which associates the problem of selecting an optimal number of shifts of work - single, double or triple shift. If a firm desires to operate on a single shift basis, the capacity output can be based on this assumption and it would be possible to have 100% capacity utilization rate if time utilization rate of capital is nearly 33% (as firms operate on a single shift basis of eight hours for each shift assuming that there exists maximum three shifts).Whether decision of capital expansion or multi-shift operation will be undertaken depends, by and large, on the matter of weighing

the alternative costs and gains both in short-run and long-run. Between two alternatives— expansion of new plant facilities or moving towards multi-shift operation— it is inevitable that most of the developing countries like India would favour the use of multi-shift operation in comparison with the further expansion of investment project because if customers' demand is rising gradually and new equipment is not available or is costly to replace, multi-shift operation would save additional capital outlay and at the same time generates employment opportunities without involving additional capital expenditure. It is also true that where there is underutilization of capacity, there is ample scope of utilizing capital more extensively by increasing working shifts in the industry. On the other hand, economic capacity is defined as the level of output at which costs are minimized, given fixed capital equipments, the techniques of production, the factor prices and the available quota of inputs in the cases when they are rationed (Phan-Thuy et.al .1981). An economically more meaningful definition of capacity output originated by Cassel (1937) is the level of production where the firm's long run average cost curve reaches a minimum. As we consider the long run average cost, no input is held fixed. For a firm with the typical 'U' shaped average cost curve, at this capacity level of output, economies of scale have been exhausted but diseconomies have not set in. The physical limit defines the capacity of one or more quasi-fixed input.

Source of data and scope of the Study :-

This paper covers a period of 14 years commencing from 1991-92 to 2004 –05 (specially covering only the reform period). Researchers face difficulty in conducting studies on capacity utilization because of inadequacy of available official data which are unreliable also. The present study is based on industry level and company- wise time series data taken from several issues of ASI, NAS and economic survey, statistical abstract (various issues), RBI bulletin etc. CMIE (Market share and Industry analysis) data are also used to arrive at explanatory variables.

The study is confined to the sub-sector levels of cement industry such as manufacture of cement, lime and plaster, manufacture of asbestos cement and other cement products.[1]

3. Overview of the industry profile of Indian Cement Industry :-

With the installed capacity of approximately 150 million tonnes in 2005, the Indian cement industry is the second largest producer in the world after China's. This accounts for approximately 6% of the global production .In spite of rapid growth in this industry, per capita consumption of cement in India (100 k..g) is still among the lowest in the world whereas world's per capita consumption is around 270 k.g. There are 128 large (0.20 MT per annum and above) and over 300 mini cement plants with estimated annual installed capacity of 151.69 MT and 11.10MT respectively. The cement industry has made tremendous strides in technological up-gradation and assimilation of the latest technology. Ninety one percent of the capacity in the industry is now based on the modern and environment friendly dry process technology. Only 7% is based on the wet process and the remaining 2% is based on the semi-dry process technology. The average utilization of capacity during the period 1991-2005 is approximately 83%. The installed capacity and production of cement for large plants from 1995-96 to 2004-05 is given in table 1.

1. Some other smaller sectors are not included for the study due to smaller data and insignificant size of their production and sales volume

Table 1 Production of cement industry for large plants(in million tonnes) , 1995-96 to 2004-05

Year	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05
Capacity	67.82	74.85	80.24	86.76	96.28	101.51	107.56	110.10	121.52	134.89	140.07	146.38	153.59
Production	51.28	52.49	59.65	64.53	69.98	76.74	81.67	94.21	93.61	102.4	111.35	117.5	127.57
Capacity utilization(%)	76	70	74	82	81	81	78	87	82	79	81	81	84

Source: CMA(Cement Manufacturers Association). (2005), Cement Statistics 2005, New Delhi, India.

The cement industry in India , second largest in the world, is highly energy intensive and the main source of energy is coal . The expenditure on energy in some of the units is sometimes as high as 50% of the total manufacturing cost. The contributions of the other fuel types –namely oil, gas or other alternative waste fuels are negligible.

The specific energy consumption for the latest plants is as low as 670 kcal/kg of clinker. For the older dry process plants , it can go up to 900 kcal /kg of clinker. Percentage share of energy input in industry's total input is around 28% on an average over the period of 25 years. The most coal- intensive sector is cement with total coal intensity of 3-4 '000 mtoe/ crore Rs of output (Energy intensity is shown in **Appendix)**. Cement consumption records a 6% increase during 2004-05 over the previous fiscal year. The cement industry's output was approximately 1.75% of the output (and of 2.2% of the GVA) of the manufacturing sector as a whole, and made it the third largest in terms of size of output among the seven major energy-intensive industries, namely Iron and steel, cement , aluminium, fertilizer, paper and paper products, chemicals, glass. This industry accounted for 3.8% of the fixed capital and employed 1.2% of the labour force in the manufacturing sector. With a 7.83% share in total manufacturing , its consumption of energy was the second highest among other major energy intensive industries. The elasticity of energy consumption with respect to output was 1.03 compared to 1.04 in the aggregate manufacturing . Even though India has the second largest cement industry in the world, its export performance is not in line with the size which accounts for less than 2% of production.

Table-2 Specific energy consumption in the cement industry (kcal/kg clinker: 1999-2000 to 2002-03

Fuel	1999-2000	2000-01	2001-02	2002-03
Thermal energy consumption	748	740	742	734
Electrical energy consumption	91	88	87	84

Note: Data relate to the specific energy consumption for 38 dry process cement plants.

Source: *National Council for Cement and Building Materials,(2003),.Energy Performance Achievement in Indian Cement Industry 2002-03, New Delhi.*

4. Dependent and independent variables and hypotheses :-

Dependent variable considered here is capacity utilization. The rate of capacity utilization is merely the ratio of its actual output 2 to the capacity output level. This study estimates the utilization rates on the basis of minimum capital output ratio (Sastry 1984). Fixed capital output ratios are first computed and

a bench mark year is then selected on the basis of observed lowest capital output. Considering lowest observed capital – output ratio, the estimate of capacity can be obtained by dividing real fixed capital stock by minimum capital output ratio. The utilization rate is given by actual output as a proportion of capacity output. Hence,

$CU=\frac{Q}{CQ}$, CU = Capacity utilization, Q = Actual output, CQ = Capacity Output

Where, $CQ=\frac{C}{C/Q}$, C is Gross Fixed Capital Stock (GFCS)

Independent variables considered in the present study are demand pressure ,capital intensity, market concentration and scale of operation. These explanatory variables can be interpreted as under:

Demand Pressure (GO) :- Demand Pressure is measured by growth rate of production over the time period.

A positive relationship is expected between demand pressure and capacity utilization on the assumption that high demand pressure will enable the firms within a particular industry to make better utilization of productive capacity.

Capital Intensity (K/L) : Capital Intensity is expressed as the productive capital used per person engaged. It is obtained by dividing productive capital by number of persons engaged.

A positive relationship between capacity utilization and capital intensity is expected because high capital-intensive firms of an industry enjoy better economies of scale inducing higher utilization rates.

Market Concentration (CONR) :- Market concentration is defined as the percentage of the sale value accounted for by the top 4 companies in the total sales of the industry. Top 4 companies have been chosen from CMIE data book in accordance with highest sales volume.

Greater efficiency of some firms within the industry ensures better market concentration. A few firms capture a larger portion of market share due to their excellent efficiency resulting increase in market concentration. Gradually, inefficient firms are wiped out of competition as a result of generating poor quality and charging high prices of products (due to increase in cost of production). Consequently, efficient firms expand their capacity as well as utilization rates to cope up with the growing market demand thereby expecting a positive relationship between capacity utilization and market concentration.

Scale of operation (MS): - Scale of operation is defined as the value of its sale as a percentage of the total sales of the manufacturing industry.

Capacity utilization can be influenced by the scale of operation of individual firms. As the scale of operation increases, there may be fewer bottlenecks and lumpiness of the individual machine is more easily balanced, thereby increasing the average CU (Lecraw, D.J,). Therefore, one would expect a positive relationship between CU and scale of operation.

5. Model and Methodology :-

In order to examine the effect of various forces (that affect CU) on capacity utilization, we estimate a linear multiple regression equation 3 for all firms taken together using industry level and company- wise time series data over a period of 14 years. The single equation model with CU as dependent variables and demand pressure (GO), capital intensity (K/L), market concentration (CONR), scale of operation (MC) along with time variable (T) as explanatory variables is depicted as under :-

$$U = \alpha + \beta_1 GO + \beta_2 (K/L) + \beta_3 (CONR) + \beta_4 (MS) + \beta_5 T$$

Where GO = Growth in production, K/L = Capital intensity, CONR = Concentration ratio, MS = Market share representing scale of operation, T =Time variable, U = capacity utilization rate.

The regression equation is estimated by ordinary least square (OLS) technique.CU is regressed separately on each independent valuable in different equations and then all explanatory variables are regressed in a single equation.

6. Empirical results :-

Table 2 (shown in **Appendix**) presents the estimated regression equations. We find a significant positive relationship between CU and demand pressure variable which supports our hypothesis. The coefficient of demand pressure variable is positive and is statistically significant in all equations at 0.05 level. The major implication of this result is that as the growth rate of production indicating demand pressure increases, pressure is expected to come upon the firms within the industry that have idle capacities to enhance their utilization rates. This suggests that with growing demand for products, cement industry has been gradually moving towards fuller utilization of capacity. It is evident that following decontrol in 1989, both in terms of price and distribution, there was a rapid expansion of output in the industry, which showed up in doubling in the rate of growth. This was made possible by significant additions to capacity as investment flowed in to take advantage of a huge market.

The regression coefficient of capital intensity variable is all positive. The regression coefficient is statistically significant at 0.05 level in four equations, one at 0.10 level and another at 0.20 level. It indicates that the cement sector with relatively more capital intensive units tends to have higher rates of capacity utilization. Capital intensity is generally considered to be the proxy for technology level. With relaxing of import restrictions due to reform process, firms have resorted to more foreign capital-intensive technologies inviting huge opportunity cost of unused capital. The result suggests that capacity utilization rate is more in highly capital -intensive firms because unless these types of firms operate at higher utilization rate, they cannot recover the higher cost of capital.

The estimated coefficient of market concentration variable indicates a positive relationship between market concentration and CU as coefficients of market concentration in all equations are positive and statistically significant at 0.05 and 0.10 level. The result implies that increase in concentration ratio leads to higher utilization of capacity indicating that capacity utilization tends to be better in more concentrated industry. Marketing styles of cement companies , of late, have seen an appreciable shift, moving from the commodity selling approach to one that is more consumer focused , and service-oriented. This has helped greater penetration into the rural and interior markets. Companies are continually widening their

marketing networks. They are now far more customer-focused , interacting closely with end users and influencers like masons, architects, civil and structural engineers. This has ushered in a new style of techno-promotion resulting in greater market penetration.

This shows that higher seller concentration creates barriers on entry of new firms in the industry, which assists concentrated firms to utilize its capacity at its fullest possible level thereby ensuring most effective utilization of scare capital resources.

Our regression result reveals that scale of operation variable represented by market share is found to be confusing and statistically insignificant. This reveals that firms with sizable portion of market share do not have significant stimulation regarding utilization of its installed capacity. The result is contrary to our hypothesis.

The explanation for not finding any significant relationship between CU and market share perhaps lies in the fact that over our study period, specially during 1990's (as our data reveals), there has not been much change in market share of major cement sectors despite many players came into operation after economic reforms that started since 1991.

Time alone was regressed on CU

$U = 0.95 - 0.016T$

(3.05)

$R^2 = 0.33$

Over the study of 1991-2005, CU decreased by 0.016% per year. This signifies that time had a very smaller impact on CU but was significantly different from zero.

7. Summary and Conclusion:-

As discussed earlier, India has undertaken various reform programmes since 1991 in order to make the economy competitive and to meet the global challengers. The objective of this paper is to assess the influence of various explanatory industrial characteristics on capacity utilization in a significant manner during the reform period. From our regression analysis, it is evident that there exist significant positive relationship between CU and the explanatory of variables such as demand pressure (GO), capital intensity (K/L) and market concentration (CONR). Although scale of operation variable reflected by sizable portion of market share is expected to exhibit a positive relationship, result obtained from our analysis is contradictory as well as unsatisfactory. With regard to the "why's" of what is revealed from our empirical result, it happens probably due to limitation and inadequacies of data. The present study lends strong support to earlier works conducted by Paul. S (1974),Goldar and Renganathan (1991) and Srinivasan (1992).

In the liberalized regime, abolition of licensing rule encouraging new entrants, and at the same time, growing demand inducing existing firms to expand and utilize its capacity to the fullest possible, larger firms having greater access regarding higher capital intensity will contribute towards favorable impact on CU in future. Since cement is a core building material, it is directly related to construction which in turn flows from economic growth . During the month of December,2008, amidst economic slowdown

worldwide, impetus given by Dr. Monmahan Singh led Government slashing housing loan rate down would optimistically encourage housing and other construction of infrastructure projects which probably will make the construction of infrastructure projects as well as cement sector more financially viable..

But there are some important lessons that can be learnt from our analysis. High demand pressure. High capital intensity and high market concentration leading higher CU might have adverse impact on scare resources, employment and distribution system.

In a nut shell, the empirical results presented in this study leave wider scope for further improvement and refinement.

References :

Afroz, G and D.K.Roy,(1976),'Capacity utilization in selected manufacturing industries of Bangladesh, *The Bangladesh Development Studies*. 4, pp 275-288

Berndt, E.R. and C.J. Morrison (1981), Capacity utilization measures : Underlying Economic theory and an Alternative Approach, *American Economic Review*, Vol.71, No2, pp 48-52.

Cassel, J.M. (1937), Excess capacity and monopolistic competition, *Quarterly Journal of Economics*, vol. 51, pp 426-443.

Chaturvedi, D.N and Amaresh Bagchi (1984), Age Structure of Fixed capital in the Indian Economy, 1970-71 to 1980-81, *Journal of Income and Wealth* 7 no. 1 : pp 82-83.

Demsetz Harold, 'Barrier to Entry', *American Economic Review* (March 1982) Vol. 72, pp 47-57

Esposito, F. F and Esposito L (1974), Excess capacity and Market share, *Review of Economics and Statistics*, Vol .56, pp 188-194.

Goldar, B and V.S. Ranganathan, (1991); Capacity utilization in Indian Industries, *Indian economic Journal* (1991), Vol 39, pp- 82-92.

Griliches, Z and Y. Ringstad (1971); Economics of scale and the form of the production function, North Holland, Amsterdam.

Hickman, B.G. (1964), On a new method of capacity Estimation, *Journal of the American Statistical Association*, 59, pp 529-49

Klein, L.R(1960), 'Some theoretical issues in the measurement of capacity', *Econometrica* ,vol.28,no.2 ,pp272-286.

Lecraw, D.J. Determinants of capacity utilization by firms in less developed countries, *Journal of development Economics* (1978),5, pp 139-153 .

Lim, D. 1976a, Capital utilization of local and foreign establishment in Malaysian manufacturing, *Review of Economics and Statistics*, 58, pp209-217.

Morrison, C.J (1985), On the Economic Interpretation and Measurement of optimal capacity ,

National Bureau of Economic Research, Working paper, no 1536.

Phan-Thuy, N et al, (1981), Industrial Capacity and Employment, *West mead: International Labour Organization.*

Paul,S,(1974) Growth and capacity utilization of Industrial capacity, *Economic and Political Weekly*, Dec7,pp 2025-2032.

Paul,S,(1974)Industrial performance and Government control in J.C,Sandesara (ed). The Indian Economy performance and prospects, University of Bombay.

Sastry,D,U,(1984), The Cotton Mill Industry in India, *Oxford University Press*, Delhi.

Srinivasan,P,V,(1992), Determinants of capacity utilization in Indian Industries, *Journal of Quantitative Economics*,vol8,no1 (Jan1992) pp139-156.

Uchikawa,S, Investment Boom and Underutilization of capacity in the 90s,*Economic and Political Weekly*,Aug2001,pp3247-3253.

Wiston,G.C,(1971),Capacity utilization and Economic Development, *Economic Journal*,81,pp36-60.

APPENDIX

A -1:- Capital Stock :- The procedure for the arriving at capital stock series is depicted as follows :

First, an implicit deflator for capital stock is formed on NFCS at current and constant prices given in NAS. The base is shifted to 1981-82 to be consistent with the price of inputs and output.

Second, an estimate of net fixed capital stock (NFCS) for the registered manufacturing sector for 1970-71 (benchmark) is taken from National Accounts Statistics. It is multiplied by a gross-net factor to get an estimate of gross fixed capital stock (GFCS) for the year 1970-71. The rate of gross to net fixed asset available from RBI bulletin was 1.86 in 1970-71 for medium and large public Ltd. companies. Therefore, the NFCS for the registered manufacturing for the benchmark year (1970-71) as reported in NAS is multiplied by 1.86 to get an estimate of GFCS which is deflated by implicit deflator at 1981-82 price to get it in real figure. In order to obtain benchmark estimate of gross real fixed capital stock made for registered manufacturing, it is distributed among various two digit industries (in our study, cement industry) in proportion of its fixed capital stock reported in ASI, 1970-71)

Third, from ASI data, gross investment in fixed capital in cement industries is computed for each year by subtracting the book value of fixed in previous year from that in the current year and adding to that figure the reported depreciation fixed asset in current year. (Symbolically, $I_t = (\beta_t - \beta_{t-1} + D_t) / Pt$) and subsequently it is deflated by the implicit deflator to get real gross investment.

Fourth, the post benchmark real gross fixed capital stock is arrived at by the following procedure. Real gross fixed capital stock (t) = real gross fixed capital stock (t – 1) + real gross investment (t) . The annual rate of discarding of capital stock (D_{st}) is assumed to be zero due to difficulty in obtaining data regarding D_{st}.

A -2 :- Table – 2 Regression Result for cement sector relating CU to GO, K/L, CONR, MS and T. Dependent Variable: Capacity Utilization

Equation	Intercept Term	GO	K/L	CONR	MS	T	R^2
1.	-0.11 (-0.197)*	0.6277 (2.627)	4.794 (1.96)	1.415 (1.94)	0.8041 (0.287)	-0.064 (-2.82)	0.7426
2.	-	0.6054 (3.06)	4.55 (2.26)	1.30 (2.82)	0.44 (0.222)	-0.0632 (-3.01)	0.7412
3.	-0.0072 (-0.018)	0.5928 (3.06)	4.62 (2.07)	1.41 (2.04)	-	-0.065 (-3.04)	0.7396
4.	1.27 (3.42)	-	-	-	-2.73 (-0.87)	-0.026 (-1.94)	0.3772
5.	0.7839 (6.53)	0.5505 (2.46)	3.633 (1.43)	-	-	-0.0597 (-2.43)	0.6033
6.	0.581 (0.91)	-	1.57 (3.39)	1.23 (2.66)	-2.95 (-0.92)	-0.03 (-1.38)	0.4888
7.	0.69 (1.19)	-	-	1.13 (2.41)	-2.93 (-0.97)	-0.0235 (-1.78)	0.46
8.	0.9172 (6.98)	-	0.881 (1.9)	-	-	-0.0232 (-0.97)	0.3365
9.	0.3789 (0.786)	-	-	1.088 (2.36)	-	-0.0127 (-1.78)	0.4144
10	0.9417 (19.15)	0.41 (1.96)	-	-	-	-0.0264 (-3.24)	0.5134

(Percentage of capacity utilization as calculated by minimum capital output ratio measure is the dependent variable in the above regression equations. Ten alternative equations have been regressed separately.)

For other independent variables, company-wise data published in CMIE(various issue) is the data source for the above regressions.

***t values are given in the parentheses below.**

GO =Growth in output indicating demand pressure. K/L = Capital intensity. CONR = Market concentration ratio. Ms = Market Share representing scale of operation T= Time variable.

A -3 :- Energy intensity is defined as energy consumption in physical units of 'j'th industry per crore rupees of value added in that industry.

E_{jkt} Energy consumed in physical units in time't' by sector 'j' for energy type 'k'.

P_{jt} 'j'th industry's value added.

Energy intensity (of energy type 'k') of 'j'th industry is given by

$e_{jkt} = E_{jkt} / P_{jt}$ (Energy intensity for non-energy sector = '000 mtoe (million tonnes of oil equivalent) /crore Rs. where mtoe / Rs is the mtoe required to produce one unit of output measured in value term , this coefficient is the measure of direct energy intensity).

Total Energy Intensity in Cement Industry

Year	Coal Intensity(000 mtoe/Rs crores)	Electricity Intensity (000 mtoe/Rs crores)	Petroleum Intensity(000 mtoe/Rs crores)	Total Intensity
1996-97	3.56367	0.18034	0.18105	3.92506
1997-98	2.55093	0.15396	0.18653	2.89142
1998-99	3.22186	0.16262	0.40440	3.78888
1999-2000	2.67140	0.13618	0.61420	3.42178
2000-2001	2.32890	0.11013	0.54157	2.9806
2001-2002	2.79190	0.12399	0.62110	3.53699
2002-2003	2.98820	0.13546	0.72887	3.85253
2003-2004	3.52100	0.14060	0.65620	4.31780
2004-2005	3.87030	0.13030	0.72930	4.7299

Issues of Nuclear Power Development in India

Sebak Kumar Jana[1]

Energy use and economic development are closely related. The faster pace of economic growth in India calls for higher growth in the power sector. The energy deficit in India is estimated to be presently about 8%. About 55% electricity in India is sourced from thermal power which is based on coal. At the current rate of utilisation of coal it is forecasted that the stock of proved reserve of coal can last for another 150 years. On the other hand, coal based power is major cause of concern for its harmful impact on environment. So there is a growing interest for search of alternative sources of energy. The share of nuclear electricity in India currently is only about 3%. Some are arguing for nuclear power, which according to them is a safe, environmentally benign and an economically viable source of electrical energy. Howeve, others are opposing on grounds of safety and world security. The paper intends to address various issues involved in nuclear power development in India.

1. Introduction:

Economic development is closely connected with the development of the power sector. To sustain a high growth, the power supply must be ensured. But the Indian economy is plagued with chronic energy deficit. The present installed capacity of electric power is 1,43,000 MW. The composition of electric power is as follows: coal – 55%, hydro – 26%, gas – 10%, renewables- 5%, nuclear – 3%, oil-1%. If India is to target 8% growth rate India's generation capacity should be over 2, 50,000 MW(Bharadwaj 2006). The energy deficit is presently about 8%. So there is urgent need to enhance the capacity of power supply. India's primary energy composition is shown in table1.

Table 1: Energy Composition in India (1965 to 2004)

	Energy (million tons equivalent in oil- MTOE)						Energy (%)					
Year	Nuclear	Hydro	Oil	Natural Gas	Coal	Total	Nuclear	Hydro	Oil	Natural Gas	Coal	Total
1965	0	4.3	12.6	0.2	35.7	52.8	0.0	8.1	23.9	0.4	67.6	100.0
1970	0.3	6.9	19.5	0.5	37.8	65.0	0.5	10.6	30.0	0.8	58.2	100.0
1975	0.5	9	23.3	0.8	48.5	82.1	0.6	11.0	28.4	1.0	59.1	100.0
1980	0.6	12.5	31.6	1.1	57.1	102.9	0.6	12.1	30.7	1.1	55.5	100.0
1985	1	11.7	43.3	3.5	77.4	136.9	0.7	8.5	31.6	2.6	56.5	100.0
1990	1.4	15	57.9	11.2	107.8	193.3	0.7	7.8	30.0	5.8	55.8	100.0
1995	1.7	17.2	75.2	17.4	142.8	254.3	0.7	6.8	29.6	6.8	56.2	100.0
2000	3.6	17.4	106.1	24.2	169.1	320.4	1.1	5.4	33.1	7.6	52.8	100.0
2004	3.8	19	119.3	28.9	204.8	375.8	1.0	5.1	31.7	7.7	54.5	100.0

Source: Nuclear Power in India.htm

[1] Sr. Lecturer, Department of Economics with Rural Development, Vidyasagar University

Due to oil price shocks in the 1970s and the1980s and the advent of new energy technologies, the share of global electricity produced from oil has shrunk from 25% in 1973 to 4% now (Chellaney 2008). But as is seen from the above table India's dependence on oil is as high as 31.7%. On the other hand, share of nuclear power has increased marginally. Nuclear power is a method for generating energy by harnessing the radioactivity of atoms. Nuclear fission occurs when any fissile material, such as uranium-235, an isotope of uranium, is concentrated or enriched. This causes a nuclear chain reaction, which releases large amounts of heat, boiling water and producing steam, which is able to drive a steam turbine and thus producing electricity (Wikipedia) . Presently there are 439 reactors in the world operating in various countries (Table, Appendix).

2. India's Nuclear Power Development

The Atomic Energy Commission (AEC) was established in 1948 under the Atomic Energy Act as a policy body. Homi Jahangir Bhava is considered as the father of Atomic Energy Programme as a founder of AEC. After that in 1954 the Department of Atomic Energy (DAE) was set up for the purpose of research and technology development. The Atomic Energy Establishment was set up at Trombay in 1957 and was renamed as Bhaba Atomic Research Centre (BARC) ten years later. The current Atomic Energy Act 1962 permits only government-owned enterprises to be involved in nuclear power. The DAE includes NPCIL, Uranium Corporation of India (mining and processing), Electronics Corporation of India Ltd (reactor control and instrumentation) and BHAVIN (for setting up fast reactors). The government also controls the Heavy Water Board for production of heavy water and the Nuclear Fuel Complex for fuel and component manufacture. The Atomic Energy Regulatory Board (AERB) was formed in 1983 and comes under the AEC but is independent of DAE. It is responsible for the regulation and licensing of all nuclear facilities, and their safety. The Nuclear Power Corporation of India Ltd (NPCIL) was commissioned in 1973. NPCIL is an active participant in the programmes of the World Association of Nuclear Operators (WANO).

Table 2: Nuclear Power Reactors in India

Reactor	State	Status	Type	MWe	Commercial Operation
Tarapur 1 & 2	Maharashtra	Operating	BWR	300	1969
Kaiga 1 & 2	Karnataka	Operating	PHWR	404	1999-2000
Kaiga 3	Karnataka	Operating	PHWR	202	2007
Kakrapar 1 & 2	Gujarat	Operating	PHWR	404	1993-95
Kalpakkam 1 & 2 (MAPS)	Tamil Nadu	Operating	PHWR	404	1984-86
Narora 1 & 2	Uttar Pradesh	Operating	PHWR	404	1991-92
Rawatbhata 1	Rajasthan	Operating	PHWR	90	1973
Rawatbhata 2	Rajasthan	Operating	PHWR	187	1981
Rawatbhata 3 & 4	Rajasthan	Operating	PHWR	404	1999-2000
Tarapur 3 &4	Maharastra	Operating	PHWR	980	2006, 2005
Total		Operating		3779	
Kaiga 4	Karnataka	Under construction	PHWR	202	end of 2008
Rawatbhata 5 & 6	Rajasthan	Under construction	PHWR	404	end of 2008. 3/09
Kudankulam 1 & 2	Tamil Nadu	Under construction	PWR (VVER)	1900	9/2009, 12/09
Kalapakkam 1 &2	Tamil Nadu	Under construction	FBR	470	2011
Total		Under construction		2976	

Source: World Nuclear Association.

The three stage nuclear program in India calls for setting up of natural uranium fuelled Pressurized Heavy Water Reactors (PHWRs) in the first stage, Fast Breeder Reactors utilizing a uranium-plutonium fuel cycle in the second stage, and Breeder Reactors utilizing thorium fuel in the third stage. The growth of nuclear power in India had started from the Tarapur Atomic Power Station-1 and 2, which were built by the Americans in the 1960s, to Tarapur Atomic Power Project-3 and 4 now, which are totally indigenous (Table 2). Tarapur Atomic Power Station-1 and 2 (TAPS 1&2) are light water reactors (LWRs) (Subramanium[1]). The first PHWR, the Rawatbhata-1 plant which was built as a collaborative venture between Atomic Energy of Canada Ltd and the Nuclear Power Corporation of India Ltd (NPCIL) was commissioned in 1973. India has achieved maturity in the first stage of this program, construction of PHWRs. The beginning of the second stage of the program has been made with the commencement of construction of a 500 MW Prototype Fast Breeder Reactor (PFBR) at Kalpakkam, Tamil Nadu in 2003.The IGCAR is responsible for designing and developing breeders in India (Subramanium[2], 2006). The third stage of the program will be launched after a sizeable base capacity has been built of the second stage reactors. At present, nuclear energy installed capacity is 3900 MWe which is 3.1% of total installed

capacity. Presently five PHWRs, one PFBR and two LWRs are under construction in India (Subramanium[3], 2006) . The PLF of Nuclear Power plants in India has increased from 60% in 1995-96 to 82% in 2000-01 but it has decreased to 57% in 2006-07 (Table 3). Constraint in nuclear fuel availability is the main reason for lower PLF. NPCIL made major strides in cutting costs and construction periods for nuclear power projects in the Tenth Plan (GOI 2007).

Table 3: NUCLEAR ENERGY RELETED RATIOS

	1960	1970	1980	1990	2000	2001	2002
Energy consumption per capita(GJ/capita)	3	7	10	13	16	16	16
Electricity per capita (k Wh/capita)	45	104	161	315	495	502	505
Electricity Production/Energy Consumption (%)	13.7	15.7	18.5	30.9	37.3	37.6	38.1
Nuclear/Total electricity (%)	-	4	3	2	3.4	3.7	3.6
Ratio of External dependency (%)	18	12	15	11	22.4	22.8	23.7
Load factor of electricity plants ~Total	41	43	41	54	-	-	-
~Thermal	38	40	39	44	69	69	72
~Hydro	49	45	45	44	-	-	-
~Nuclear	-	66	40	54	82	83	90

Source: Nuclear Power. htm, adapted from Bose[2] (2008)

3. Arguments for Nuclear power:

The following arguments are generally put forward in favour of nuclear power development.

- Per capita consumption of electricity presently in India is only 505 kWh per year. In the countries comprising the Organisation for Economic Cooperation & Development (OECD), the corresponding figure is about 10,000 kWh per year. The per capita energy consumption in kg oil equivalent for some countries are as follows: India – 430, China – 775, USA – 7722 and world average – 1,686. So there is urgent need enhance the installed capacity and to search for alternative options.
- Nuclear power is cheaper than that from other sources. The current operating costs of nuclear

power, coal power and natural gas are respectively 1.82, 2.13 and 3.69 cents per kwh (Ginsberg 2006).

- The whole waste disposal problem of nuclear power is misconstrued. Nuclear fuel can be recycled as source for the production of further energy. Reprocessing would eliminate most of the waste from nuclear power production. Over decades it could also eliminate the pressure on uranium supplies. The world's existing reserves of uranium can withstand 50 years of expansion of nuclear power. Advanced breeder reactors can create more fuel as they generate power. One study claims that coal fired plant releases 100 times more radioactive material into the air.
- Burning coal and other fossil fuels are driving climate change causing forest fires, florida hurricanes, melting polar ice sheets. Though per capita emission of $CO_{2\,in}$ In India is only about 5% of US, India is now world's sixth largest emitter of CO_2. Annual compound growth of CO_2 in India is 5.5% as against China's 4% (Bharadwaj 2006).
- There has been renewed interest in nuclear energy from national governments, the public, and some notable environmentalists due to increased oil prices.
- Proponents of nuclear power claim that the safety record is already good when compared to other fossil-fuel plants.
- Nuclear power contributes a substantial share of electricity in some countries. The shares of nuclear power in electricity generation for some countries are: France: 77%, Belgium – 54%, Sweden 46%, South Korea – 35.3%, Switzerland- 43%, Japan- 27.5%, Spain – 17.4%, UK-15% (Table, Appendix).

4. Arguments Against Nuclear Power:

The following arguments are given against nuclear power development.

The use of nuclear power is controversial because of the problem of storing radioactive waste for indefinite periods. The fuel rods, large part of the plant and some of the liquid effluents, all become highly radio-active and remain so for indefinite period. It takes thousands of years before for the complete decay of some radioactive materials (Bose 2000).

Construction of nuclear power plants declined following the 1979 Three Mile Island accident and the 1986 disaster at Chernobyl. The last US nuclear plant to be built was ordered in 1973. As the table 4 shows, most of reactors in the world are comparatively older. The appendix table shows that most of the proposed plants are in the developing countries like China, India and South Africa.

Table 4: Age Distribution of Nuclear Power Reactors in the World

	Reactors		Percentage	
Age (Years)	Nos of Units	MW		
(1-5)	19	16722	4.4	4.5
(6-10)	20	15179	4.6	4.1
(11-15)	30	28338	6.9	7.7
(15-20)	61	60535	14.0	16.4
(21-25)	128	119010	29.4	32.3
(25-30)	77	64955	17.7	17.6
(30-35)	74	51534	17.0	14.0
(36-40)	26	11928	6.0	3.2
	435	368201	100.0	100.0

Source: World Nuclear Association

- Apart from accidents, there are also associated problems of health with nuclear radiation from power plant. A study of the health consequences on the local population at Rajasthan Atomic Power Station observed statistically significant increase in the rates of congenital deformities, spontaneous abortions, solid tumors (Mian et al 2005).
- Critics including most major environmental groups believe that nuclear power is an uneconomic. US Atomic Energy Commission Chairman once claimed that nuclear energy would become "too cheap to meter". Its pity to note that nuclear power industry everywhere subsists on generous state subsidies (Chellaney 2008). The economics of nuclear power has been discussed in the next section.
- During the operation of nuclear power plants, radioactive waste is produced, which in turn can be used for the production of nuclear weapons. There is concern that some countries operating research reactors and fuel enrichment plants. The energy source for nuclear energy is Uranium. Uranium is a scarce resource, its supply is estimated to last only for the next 30 to 60 years depending on the actual demand.
- The time frame needed for formalities, planning and building of a new nuclear power generation plant is in the range of 20 to 30 years in the western democracies. It is an illusion to build new nuclear power plants in a short time.
- State control of nuclear power is shrouded with secrecy in most countries. The Atomic Energy Act of 1962 in India prohibited any transmission of information by the agencies involved in nuclear research or power generation. So it is very hard to estimate the actual accidents in nuclear power. According to Greenpeace calendar nuclear related accident is occurring everyday somewhere in the world.
- Whatever its other merits, the nuclear power development makes us dependent both for fuel and technology to use it, affecting our energy security, if it becomes a significant portion of our total energy. We should have to forget about our 'energy independence'. Global nuclear reactor and fuel business are the moist monopolized and politically regulated commerce in the world (Chellaney 2008).

- Nuclear power has always underperformed inspite of state support in terms of expenditure on R&D and other supports. The present installed capacity of nuclear power in India is only about 3%.
- The establishment of nuclear power plant requires much land and water. A 10,000 MW new nuclear power plant is reported to require 1.5 sq.km. area and 3.5 sq. km. buffer zone.
- Planning commission has claimed that nuclear power is an important tool for decarbonising the power sector. About .05 million tons of CO_2 are avoided per MW of nuclear power. But it has been shown that extent of decarbonistion is limited even if we assume the plans of expansion of nuclear power are completely successful (Reddy 2005).
- Renewable energy is making faster progress compared to nuclear power in various countries. The nuclear power in India has increased from only 860 MW in 1981-82 to 3310 MW in 2005-06 when the nuclear power has increased only marginally. The cost of renewable energy production is falling worldwide. The present estimated cost of generation of renewables in India is given in the table 5.

Table 5 : Cost of Generated Electricity from the Renewable Options

S. No.	Source	Capital Cost (Crore of Rs. Per MW)	Estimated Cost of Generation per Unit (Rs. Per kWh)
1	Small hydro-power	5.00-6.00	1.50-2.50
2	Wind power	4.00-5.00	2.00-3.00
3	Biomass power	4.00	2.50-3.50
4	Bagasse co-generation	3.5	2.50-3.00
5	Biomass gasifier	1.94	2.50-3.50
6	Solar photovoltaic	26.5	15.00-20.00
7	Energy from waste	2.50-10.0	2.50-7.50

Source: GOI (2008)

5. Economics of Nuclear Power in India:

The relative economics of electricity generation by coal-based and nuclear power stations is controversial. This is because of the difficulty of the estimation of costs of nuclear power. The cost of production of nuclear power includes capital cost (largest component) and recurring cost. Capital cost of the reactor includes construction cost and the costs of inititial loading of fuel and heavy water. The recurring costs include fuel loading costs, heavy water make up costs, operation and maintenance cost and waste management.. Ramana et al (2007) shows that PHWR is more expensive than the thermal power above 3.6% discount rate. The levelised cost of electricity (Rs./Kwh) of Kaiga I &II at 12% nominal discount rate is 2.20and 1.86 compared to 1.56 at Raichur thermal power station (RTPS VII) with the assumption of heavy water price at Rs. 12,525/kg and waste management cost of Rs. 10,000/kg. It has been estimated that levelised cost of reprocessing each kilogram of spent fuel is Rs. 26,000, the entire cost of which is borne by DEA. The problem of the estimation is that the air pollution resulting from coal based thermal plants and public health impacts of radioactive wastes have not been considered in the analysis. On the other hand Srinivasan et al (2005) have criticised Ramana et al on various grounds like assumption of higher capital cost of Kaiga I and Kaiga II.

While thermal stations are slightly cheaper to roll out and involve lower gestation spans compared to nuclear ventures, perhaps the biggest driver for India to go nuclear is that the country house the world's second-largest reserves of thorium, which is an alternative to uranium. The present government is planning to increase the national nuclear power generation capacity from 3,900 Mwe to 20,000 Mwe by 2020. A ballpark calculation indicates a 1,000 mw nuclear plant will require about Rs. 6,000 crore to set up (Rs. 6 crore per mw) and would generate at roughly Rs. 2.5 per unit. For a coal-fired thermal plant, cost benchmark is marginally less at Rs. 4.5 crore per mw (Prabat et al 2008).

The Centre is contemplating bringing in a law allowing the entry of private sector in nuclear power industry (The Statesman , December 12, 2008). The big private player in India, along with the nuclear industry abroad are trying to enter nuclear power in a big way (Purkayastha, 2008). The new Electricity Act that demands that all new plants must compete in terms of tariff. Unless this Act is amended, there is no way that private nuclear plants are going to be cost competitive.

6. Conclusions:

Its true that all efforts should be made to enhance the capacity of power to keep pace with economic development of the country. But we should go forward cautiously. We should first try to conserve energy by improving energy intensity. We should also try to explore other alternative energy sources. During the last fifty years a colossal amount of resources have been devoted to nuclear power development in India. The results are not encouraging as yet. The recent Indo-US nuclear deal should be mentioned here. The IAEA safeguards agreement has supposedly been made for uninterrupted nuclear fuel supplies. But this agreement fails to address the fundamental problems in the Hyde Act and the 123 Agreement. The issue is not whether India should go for nuclear power development, but the issue is whether the future nuclear power development should be based on imported Light Water Reactors(LWRs) instead of indigenous technology of PHWRs and FBRs. According to External Affairs Ministry, the nuclear trade in India will account for 23 billion dollars in the next 10 to 15 years, the principal beneficiary of which will be US followed by France and Russia (Cherian 2008). It has been reported that India's purchase of US nuclear rector will add new 3,000-5,000 direct jobs and 10,000 to 15,000 indirect jobs in US(Ramachandran 2008).

Energy intensity is measured as a ratio of the number of energy units required to produce one unit of GDP and expressed as an absolute number. The lower the energy intensity, more efficient is its use and less its requirement. The critical factor for any country to achieve energy security is to strive to reduce its intensity in the GDP. Today the share of nuclear energy in our energy mix is about 3% and this is expected to increase to 6% by 2020 or so with this deal. But if our energy intensity is reduced, say to Malaysian level (0.5), the share of nuclear energy goes up to 6% even without this deal. If we reach the level (0.2) of OECD countries, the share rises to about 15%, without adding a single megawatt of nuclear power. A drop of 0.1 or 10% in our energy intensity will save us 11MT of oil. So, conservation of energy should become a way of life.

The biggest answer to meet the challenges of energy security and global warming is harnessing power from renewables like bio-power, wind power, solar power. According to a calculation only Delhi can save Rs. 821 crores and CO_2 reduction would be around 23 lakh tonnes if 50% households in Delhi

install solar water heating system (CSE 2008). So, new laws need to be framed to promote these non-conventional energy sources.

References :

1. Bharadwaj A. et al (2006), 'Whither Nuclear Power?', *Economic and Political Weekly*, March 25.
2. Bose D. N. (2007)[1], 'Too Cheap to Meter-II', *The Statesman*, 4th September, 2007.
3. Bose D.N. (2007)[2], 'Too Cheap to Meter-I', *The Statesman*, 3rd September, 2007
4. Bose Deb Kumar (2000), 'Nuclear Power for Eastern India', *Economic and Political Weekly*, 23rd September, 2000.
5. Chellaney B (2008), 'Too Much Hot Air in Nuke Deal', *The Economic Times*, 4th July, 2008.
6. Cherian John (2008), 'The Morning After', *Frontline*, October 10, 2008.
7. CSE(2008), 'Here Comes the Sun', *Down to Earth*, December 1-15.
8. Ginsberg M (2006), 'Energy Solutions Can Lead to More Prosperity', *SPAN*, Vol.7, September/ October, 2006.
9. GOI (2008), Eleventh Five Year Plan, 2007-12, *Planning Commission*, Government of India.
10. Mian Z. et al (2005), 'Feeding the Nuclear Fire', *EPW*, August 27, pp. 3808-3111.
11. Parbat Kalyan & Debjoy Sengupta (2008), 'Nuclear Power Expected to Solve Nation's Power Woes', *The Economic Times*, 4th August, 2008.
12. Purkayastha Prabir (2008), 'The Hard Landing of Nuclear Power', *People's Democracy*, November 9, pp. 5.
13. Ramachandran R. (2008), 'Unclear Future', *Frontline*, October 10.
14. Ramacharan R (2008), 'Nuclear Hurdles', *Frontline*, 10th October, 2008.
15. Ramana M.V. et al (2005), 'Economics of Nuclear Power from Heavy Water Reactors', *EPW*, April 23.
16. Ramana M.V. et al (2007), 'Economics of Nuclear Power: Subsidies and Competitivenes', *Economic and Political Weekly*, January 13.
17. Rao T N R (2008), 'Energy Security or Fuel Poverty?', *The Economic Times*, 26th August, 2008.
18. Reddy K.N. (2005), 'False Assumption of Nuclear Deal', *EPW*, August 27.
19. Sharma D C (2006), 'Renewables Get New Steam', *SPAN*, Vol.7, September/October, 2006.
20. Srinivasan, M R, R B Grover and S A Bhardwaj(2005): 'Nuclear Power in India: Winds of Change', *Economic and Political Weekly*, December 3, XL(49).
21. Subramanian T S (2006)[1], 'A Feat at Tarapur', *Frontline*, 21stApril, 2006.
22. Subramanian T S (2006)[2], 'India on The Right Track', *Frontline*, 25th August, 2006.
23. Subramanian T S (2006) [3], 'Of Safeguards and India's Needs- Interview With Anil Kakodar', *Frontline*, 7th April, 2006.
24. Wikipedia, 'Nuclear Power by Country', the *free encyclopedia.htm*
25. World Nuclear Association, *http://www.world-nuclear.org/*

Appendix: Table: Country-Wise Nuclear Power Development

COUNTRY	NUCLEAR ELECTRICITY GENERATION 2007		REACTORS OPERABLE		REACTORS UNDER CONSTRUCTION		REACTORS PROPOSED	
			Dec 2008		8-Dec		Dec 2008	
Country	billion kWh	% e	No.	MWe	No.	MWe	No.	MWe
Argentina	6.7	6.2	2	935	1	692	1	740
Armenia	2.35	43.5	1	376	0	0	1	1000
Bangladesh	0	0	0	0	0	0	2	2000
Belarus	0	0	0	0	0	0	2	2000
Belgium	46	54	7	5728	0	0	0	0
Brazil	11.7	2.8	2	1901	0	0	4	4000
Bulgaria	13.7	32	2	1906	0	0	0	0
Canada	88.2	14.7	18	12652	2	1500	6	6600
China	59.3	1.9	11	8587	9	8700	76	62600
Czech Republic	24.6	30.3	6	3472	0	0	2	3400
Egypt	0	0	0	0	0	0	1	1000
Finland	22.5	29	4	2696	1	1600	1	1000
France	420.1	77	59	63473	1	1630	1	1600
Germany	133.2	26	17	20339	0	0	0	0
Hungary	13.9	37	4	1826	0	0	2	2000
India	15.8	2.5	17	3779	6	2976	15	11200
Indonesia	0	0	0	0	0	0	4	4000
Iran	0	0	0	0	1	915	1	300
Israel	0	0	0	0	0	0	1	1200
Italy	0	0	0	0	0	0	10	17000
Japan	267	27.5	55	47577	2	2285	1	1100
Kazakhstan	0	0	0	0	0	0	2	600
Korea (North)	0	0	0	0	0	0	0	0
Korea (South)	136.6	35.3	20	17716	3	3000	2	2700
Lithuania	9.1	64.4	1	1185	0	0	2	3400
Mexico	9.95	4.6	2	1310	0	0	2	2000
Netherlands	4	4.1	1	485	0	0	0	0
Pakistan	2.3	2.34	2	400	1	300	2	2000
Poland	0	0	0	0	0	0	5	10000
Romania	7.1	13	2	1310	0	0	1	655
Russia	148	16	31	21743	8	5980	25	22280
Slovakia	14.2	54	5	2094	2	840	1	1200
Slovenia	5.4	42	1	696	0	0	1	1000
South Africa	12.6	5.5	2	1842	0	0	24	4000
Spain	52.7	17.4	8	7448	0	0	0	0
Sweden	64.3	46	10	9016	0	0	0	0
Switzerland	26.5	43	5	3220	0	0	3	4000
Thailand	0	0	0	0	0	0	4	4000
Turkey	0	0	0	0	0	0	1	1200
Ukraine	87.2	48	15	13168	0	0	20	27000
UAE	0	0	0	0	0	0	11	15500
United Kingdom	57.5	15	19	11035	0	0	6	9600
USA	806.6	19.4	104	100845	0	0	20	26000
Vietnam	0	0	0	0	0	0	8	8000
WORLD**	**2608**	**15**	**439**	**373,676**	**39**	**33,018**	**270**	**266,275**

Source: World Nuclear Association

Determinants of R&D Efforts: A Study of Indian Manufacturing Sector

Pulak Mishra

With the process of liberalization and globalization leading to increase in market competition and making innovation-based competition imperative, the present paper makes an attempt to examine the role of risks in determining industry level R&D efforts in Indian manufacturing sector. It is found that industry risks have significant negative influence on both incidence and extent of R&D efforts of the firms in Indian manufacturing sector, given market concentration, size of the market, capital intensity ratio, intensity of purchasing foreign technology and extent of vertical integration. While firm level risks encourage incumbents to put greater efforts on R&D to enhance their competitive strength, industry level risks make the firms reluctant for the same and force them to rely on equity linked technology transfer. Along with subsidies as it is suggested in many of the existing studies, enhancing R&D efforts, therefore, requires an effective regulatory mechanism to control for industry level risks and increase in concentration in the market place.

Determinants of R&D Efforts: A Study of Indian Manufacturing Sector

Introduction

Innovation is considered as one of the most significant drivers of market competition in the context of rapid changes in the pattern of production and nature and extent of competition. With production becoming more and more knowledge-oriented across a wide range of industries and the process of liberalization and globalization leading to increase in market competition, diffusion of a process of innovation-based competition is imperative. But, while the developed country firms make significant in-house R&D efforts, in the developing countries, technological progress takes place mainly through spillovers from trade, foreign direct investment, licensing, joint ventures, mergers, acquisitions and various other alliances.

In India, though the process of liberalization has exposed the manufacturing sector to greater competition, the state of R&D efforts by the firms is highly dissatisfactory, particularly in comparison with most of the industrialized and newly industrializing economies that have given adequate emphasis on innovation in their policy framework. The R&D expenditure as a proportion of GNP for the world increased from 1.85% in the 1980s to 2.55% in the 1990s. Contrary to this, in India, proportion of GNP spent on R&D was not only very low during this period, it, though increased from 0.58% in 1980-81 to 0.91% in 1987-88, declined subsequently and reached 0.82% in 1998-99. Industry sector constitutes only 23% of this national R&D expenditure and the bulk comes from public funded institutions (Kumar, 2005). Real

Assistant Professor, Department of Humanities and Social Sciences, Indian Institute of Technology, Kharagpur, Kharagpur – 721 302. India. E-mail: pmishra@hss.iitkgp.ernet.in

R&D expenditure by the firms declined in 12 out of 28 broad industries in the 1990s (Basant and Morris 2000). Further, the R&D intensity varies significantly across industries (Mishra, 2005). Even in the industries where real R&D expenditure has increased, the intensity has either stagnated or declined (Mani and Bhaskar, 1998; Basant and Morris, 2000).

The present states of R&D efforts in Indian manufacturing sector are, therefore, matters of serious concern. A number of studies have attempted to explore different aspects of R&D efforts in Indian manufacturing (e.g., Kumar and Agarwal, 2000). But, examining the role of risks and uncertainties in determining R&D efforts is largely ignored in the existing studies, though theoretically it seems to be quite important in the current regime of deregulation and competition. In fact, R&D efforts by a firm depend considerably on risks in the market and with increase in uncertainties, it becomes risky for the firms to spend on in-house R&D. This is particularly so as expenditure on R&D by a firm is an *endogenous sunk cost* (Sutton, 1991)[1] and massive innovative efforts by a firm do not always yield success in the market (Scheer, 2000). Given the difficulty in predicting the demand patterns of the consumers and R&D strategies of the rivals with information asymmetries, there is a huge stochastic component in R&D spending and economic returns. Further, possibility of disclosure of the outcomes of publicly funded R&D projects also poses threat on the rate of returns and, therefore, reduces firms' own R&D expenditure.

This means that risks are likely to have significant impact on R&D efforts by the firms in a deregulatory and competitive environment. The present paper makes an attempt to examine the role of risks in determining industry level R&D efforts in Indian manufacturing sector, controlling for various structure, conduct (other than R&D) and policy related aspects. The rest of the paper is divided into five sections. Section 2 gives an overview on R&D efforts by the Indian manufacturing firms in the liberalization era. Section 3 makes an attempt to develop a conceptual model on determinants of R&D efforts. Section 4 discusses the estimation techniques and database used in the paper. Section 5 gives the results and interprets the same. Section 6 summarizes the findings and makes policy suggestions.

2. R&D in Indian Manufacturing Sector: An Overview

The present paper examines the R&D efforts by the firms in Indian manufacturing sector vis-à-vis two other important technology strategies, viz., foreign technology purchase (FTP) and foreign technology collaboration (FTC).

In-House R&D :

According to Basant and Morris (2000), the real R&D expenditures in the private sector grew at about 7 per cent in the 1990s. This was slightly a lower rate than what was achieved the late 1980s. Further, there were significant differences in the rate of growth across major industry groups. While in telecom, agricultural machinery, chemicals, dyestuff, drugs and pharmaceuticals, textiles, soaps and cosmetics, glass, and cement the real R&D expenditure grew at a faster rate than that in the late 1980s, in the rests, the rate of growth was either lower than that of the late 1980s or even negative.

1. It is a sunk cost because it is a fixed cost and often has limited salvage value. It is endogenous as the firm's

Table 1: Trends and Patterns of R&D Intensity 1988-2000

	R&D Intensity (%)				
Product Group	1988-91	1991-94	1994-97	1997-00	1991-00
Food Products	0.05	0.04	0.08	0.11	0.08
Beverages & Tobacco	0.01	0.04	0.10	0.10	0.08
Cotton Textiles	Neg.	0.03	0.04	0.08	0.05
Synthetic Textiles	0.01	0.05	1.02	0.11	0.39
Other Textiles	0.01	0.08	0.09	0.06	0.08
Chemicals & Plastics	0.03	0.26	0.48	0.59	0.44
Drugs & Pharmaceuticals	0.13	0.72	1.44	1.57	1.24
Petroleum Products	Neg.	0.03	0.05	0.06	0.05
Tyres & Tubes	0.17	0.42	0.26	0.34	0.34
Rubber & Rubber Products	Neg.	0.08	0.14	0.12	0.11
Cement	0.00	0.01	0.15	0.16	0.11
Other Non-metallic Mineral Pdts	0.01	0.09	0.55	0.27	0.29
Ferrous Metals	0.06	0.19	0.14	0.13	0.15
Non-Ferrous Metals	0.07	0.09	0.14	0.19	0.14
Non-Electrical Machineries	Neg.	0.38	0.46	0.74	0.51
Electrical Machineries	0.28	0.36	0.54	0.59	0.50
Electronics	Neg.	0.36	0.49	1.57	0.81
Automobiles	0.09	0.47	0.57	0.78	0.61
Auto-Ancillaries	0.07	0.15	0.64	0.83	0.54
Paper & Leather Products	0.03	0.04	0.08	0.10	0.07
Diversified	0.03	0.21	0.28	0.25	0.25
Total	0.04	0.17	0.29	0.35	0.27

Note : Neg. – negligible.

Source : 'PROWESS' Database, CMIE, Mumbai.

But, despite this 7% rate of growth of R&D expenditure, which is largely due to low base, the policy changes in the form of removal of restrictions on royalty rates in the 1990s failed to make any significant improvement in R&D intensity. Table 1 shows that although many of the industries recorded substantial increase in R&D intensity over the years, the average R&D intensity was still very low and varied significantly across industries in the 1990s. Except drugs & pharmaceuticals, neither of the industries spent even one rupee on R&D out of their sale of rupees one hundred. Besides, in the some of the industries, R&D intensity in the 1990s was lower than that during 1988-91.

Table 2: Trends in FTPs by Indian Firms Across Industries, 1998-2000					
Product Group	Average Expenditure on FTP/Sales (%)				
	1988-1991	1991-1994	1994-1997	1997-2000	1991-2000
Food Products	0.04	0.07	0.13	0.20	0.13
Beverages & Tobacco	0.02	0.06	0.04	0.04	0.05
Cotton Textiles	Neg.	0.05	0.11	0.09	0.08
Synthetic Textiles	0.11	0.21	0.29	0.17	0.22
Other Textiles	0.01	0.04	0.07	0.05	0.05
Chemicals & Plastics	0.20	0.43	0.41	0.37	0.40
Drugs & Pharmaceuticals	0.01	0.08	0.12	0.16	0.12
Petroleum Products	0.01	0.03	0.42	0.16	0.20
Tyres & Tubes	0.27	0.31	0.20	0.12	0.21
Rubber & Rubber Products	0.15	0.42	0.11	0.11	0.21
Cement	1.66	0.08	0.08	0.13	0.10
Other Non-metallic Mineral Pdts	0.15	0.31	0.26	0.18	0.25
Ferrous Metals	0.22	0.38	0.45	0.28	0.37
Non-Ferrous Metals	0.23	0.31	0.37	0.25	0.31
Non-Electrical Machineries	0.27	0.43	0.33	0.30	0.35
Electrical Machineries	0.30	0.27	0.22	0.18	0.22
Electronics	0.16	0.45	0.70	0.93	0.69
Automobiles	0.38	0.44	0.38	0.60	0.47
Auto-Ancillaries	0.27	0.46	0.35	0.41	0.41
Paper & Leather Products	0.04	0.07	0.10	0.44	0.20
Diversified	0.42	0.26	1.26	0.50	0.67
Total	0.21	0.25	0.42	0.31	0.33

Source: 'PROWESS' Database, CMIE, Mumbai.

Foreign Technology Purchase:

As regards, foreign technology purchase (FTP), the ratio of expenditure on purchasing foreign technology to sales showed a significant jump in many industries during 1991-2000, but it fluctuated and the average intensity during this period was very low even in the late 1990s (Table 2). Further, like R&D intensity the ratio of expenditure on FTP to sales varied significantly across the broad industry groups. The ratio was relatively high only in a few industries like chemicals, plastics, non-electrical machineries, electronics, automobiles, and auto-ancillaries. But, in neither of the industries the intensity was even 1 percent. This means that Indian firms did not rely on foreign technology in a considerable way to substitute in-house R&D.

Foreign Technology Collaborations:

The Indian firms depended increasingly on technology related collaborations with foreign firms to have access to foreign technology in the first half of the 1990s. But, the number of approved foreign technology collaborations (FTCs) declined continuously over the years during the second half of the decade. Further, the proportion of FTCs in total foreign collaborations also declined drastically in the

1990s[2]. For the entire period taken together, FTCs constituted only 36 percent of total collaborations approved (Table 3).

Table 3: Distribution of Foreign Technology Collaborations by Broad Industry Groups, August 1991 to March 2002.

Industry	Foreign Technology Collaborations			
	No. of FTCs	Share in FTCs (%)	No. of FFCs	FTCs/ FFCs (%)
Basic Goods Industries	1240	21.69	1326	93.51
Capital Goods Industries	2666	46.62	2212	120.52
Intermediate Goods	207	3.62	412	50.24
Consumer Non-Durable Goods	687	12.01	1554	44.21
Consumer Durable Goods Industries	30	0.52	76	39.47
Services	432	7.56	2605	16.58
Total	5718	100.00	8512	67.18

Note: FTCs – Foreign Technology Collaborations, FFCs – Foreign Financial Collaborations,
Source: SIA News Letter, Ministry of Commerce and Industry (GOI), various issues.

Thus, instead of spending for in-house R&D or purchasing foreign technology or exploring pure technology related foreign collaborations, firms in many of the technology-intensive industries relied on equity linked foreign collaborations for technology development. But, while such sourcing of technology through foreign collaboration is a common phenomena in most of the developing countries, a number of such collaborations have failed to fetch results as expected, and many have run into rough weather in implementation (Kumar, 2002). Further, heavy dependence of the country like India on import of technology may not be congenial for enhancing its global competitiveness, congenial for sustainable, mutually beneficial international trade and may not be in the best interest of even the developed world. Besides, such technology-based entry of foreign firms either in the disembodied form (through technology licensing) or in the embodied form (through supply of machines and materials) can also create entry barriers for the potential entrants and, thereby, may restrict market competition.

Hence, in-house R&D activities should be enhanced to make the technology development process effective and sustainable. This requires identification of the factors that influence R&D efforts and design the policy framework accordingly. The rest of the paper is devoted in this direction.

3. Determinants of R&D: The Analytical Model

Specification of Functional Relationship:

The factors determining R&D efforts by the firms can be identified in a structure-conduct-

2. The declining trend of FTCs, especially as proportion of TFCs may be due to the domestic firms' preference towards accessing foreign technology through manufacturing, marketing and finance related alliances instead of pure technology collaborations/licensing/ purchasing because of the high prices of foreign technologies and lack of necessary infrastructure for successful implementation. Further, with the deregulatory policy measures allowing the foreign firms to enter into and to have majority controls in Indian industry, the foreign firms seemed to prefer equity-linked technology transfer (Basant and Morris, 2000).

performance-policy framework that postulates multidimensional causal relationships among market structure, firms' conduct, their performances and policies of the government. With R&D effort being an important conduct or strategy of a firm, it is likely to be affected by a variety of structural, strategic, performance and policy related factors.

Given this conceptual understanding, let us hypothesize that R&D efforts by the firms (R&D) in industry i in period t depend on structure of the market (MST), firms' performance (PER), firms' conduct other than R&D (FCN) and related government policies for the industry (GP) in the previous period, i.e.,

$$R\&D_{jt} = f(MST_{j,t-1}, FCN_{j,t-1}, PER_{j,t-1}, GP_{j,t-1})$$

As regards the explanatory variables, the paper captures structure of markets by using three variables, viz. market concentration (CON), capital-intensity ratio (KIR) and market size (MSZ). For firms' conduct other than R&D, two variables have been considered, viz. vertical integration (VI) and foreign technology purchase (FTP). FTP is also expected to capture necessary policy changes by the government relating to sourcing foreign technology. The variables relating to performance include firm level risks (FR) and industry level risks (IR). The above functional relationship can, therefore, be rewritten as the following :

$$R\&D_{jt} = f(CN_{j,t-1}, MSZ_{j,t-1}, KIR_{j,t-1}, VI_{j,t-1}, FTP_{j,t-1}, FR_{j,t-1}, IR_{j,t-1})$$

In the present paper, all the variables are measured as simple three years' averages with one year starting lag from the year under reference to make the data set more consistent over time. Further, such measures of the variables along with one-year lag in the functional model take care of the adjustment process for the variables and, thereby, eliminate the problem of simultaneity among the variables[3].

Probable Impact of the Explanatory Variables

CN: CN influences both the urge and the ability of the firms in an industry to make R&D efforts. On the one hand, decline in CON, i.e., higher market competition raises the urge on the part of the firms to make greater R&D efforts for enhancing their competitiveness. On the other hand, with the increase in market competition, profitability and hence ability of the firms to invest for R&D declines. Contrary to this, the Schumpeterian proposition suggests that oligopolistic market structures are more conducive to R&D than pure or perfectly competitive ones. In oligopoly, with possible threat of entry and import competition, firms are expected to put more efforts towards product, process and practice related in-house R&D to protect their market shares[4]. Hence, the relationship between CON and R&D is a complex one and the exact nature of relationship would depend on which of these processes dominates empirically.

KIR: KIR can be seen to influence the decision for R&D in terms of its role as an entry barrier. Highly capital-intensive industries raise exogenous sunk costs and deter entry and, therefore, reduce possible

3. The relationship envisaged here is at the industry level. A similar framework can be used to analyze R&D related decisions at the firm level as well. But the data requirements for such an exercise are high and difficult to be satisfied. In what follows we discuss the likely relationship of the independent variables with the decision to merge or acquire.

4. It must be pointed out, however, that the market structure most appropriate for spurring technological change may be different for different industries, depending on factors such as economies of scale in production and innovation.

competitive threat. This makes the firms reluctant towards R&D. Further, in many of the capital-intensive industries necessary technologies are sourced in embodied form (through machines, tools, equipments, etc.) and this reduces the necessity of in-house R&D efforts.

MSZ: An increase in MSZ can affect R&D efforts in two ways. On the one hand, it is likely to encourage entry of new players into an industry. This raises possible competitive pressures on the existing firms and forces them to enhance their competitiveness through R&D. On the other hand, a larger market provides opportunities for business expansion by the firms in the industry. This induces the firms to spend more on R&D. In other words, a larger market is expected to result in greater R&D efforts.

FTP: Many developing country firms source technologies from abroad due to their limited capabilities towards development of indigenous technologies. The relationship between R&D and FTP may be complementary or substitute. In some industries, foreign technology may require further R&D efforts on the part of importing entity to absorb, adapt and assimilate the imported knowledge to local conditions. In some other, it may substitute R&D efforts and hence may discourage R&D by the receiving firms. The nature of the industry and the technology sourced determine whether the relationship will be complementary or a substituting type.

VI: High levels of vertical integration in an industry help firms to diffuse innovation output and distribute the expenses across a wide range of products that are linked in forward or backward direction. Therefore, as competitive pressures rise, one can expect the firms to take the scope for technology diffusion and the cost advantages of greater R&D efforts through vertical integration.

FR: High FR, conventionally measured in terms of variability in a firm's performance over time, is likely to compel the firm to make R&D efforts to stabilize its performance. In industries with greater variability in FR, firms are expected spend more on R&D to strengthen their position in the market place and make their performance more consistent. This is especially so when the variability is due to increasing inter-firm competition in the industry.

IR: While FR is expected to have direct relationship with R&D efforts, IR is likely to have inverse relationship with the same. When high variations in the industry level profitability are due to variations in profitability of most of the firms in the industry, there is not much intra-industry difference in this regard. This gives a single firm a very little scope to gain from R&D. Instead, the firms consider such efforts as risky propositions. This means that the industries with high variability in profit are likely to experience less R&D efforts by the firms and vice versa.

4. Estimation Techniques and Database

Estimation Technique:

In the present paper, attempts are made to identify the determinants of R&D efforts at two levels, viz., incidence of R&D and extent of R&D efforts.

Incidence of R&D Efforts

In order to examine the determinants of the incidence of R&D efforts, we estimate the following **Probit**

Model :

$$y_{it} = \beta x_{it} + u_{it}$$

Here, y_{it} is the dependent variable, β is a (K × 1) vector of unknown parameters, x_{it} is a (K × 1) vector of explanatory variables, and u_{it} are the residuals which follow independently and normally distributed with mean 0 and variance σ^2. y_{it} = 1 if the R&D intensity is greater than zero and y_{it} = 0 otherwise. As we assume one-year lag in the explanatory variables, the above model can be rewritten as :

$$y_{it} = \beta x_{i,t-1} + u_{i,t-1}$$

Extent of R&D Efforts

It is observed that the distribution of R&D intensity at aggregate industry level is highly skewed towards few industries. At the detailed disaggregate level there are a number of product groups where no R&D effort takes place. In such a scenario, since the dependent variable (extent of R&D efforts) can be observed only when R&D intensity > 0 and R&D intensity = 0 if no R&D expenditure takes place, there is a censoring of R&D intensity at 0. With this censoring of the dependent variable, the mean value of the error term becomes different from zero and application of OLS will, therefore, violate the basic assumption of the classical linear regression model that the expected value of the error term is zero. This means that application of OLS method in such a situation will lead to biased estimator.

Under these conditions, the ***Tobit Model*** or the ***Limited Dependent Variable Model*** developed by James Tobin (1958) is applied to capture the restrictions put on the values of the dependent variable. The Maximum Likelihood Method is applied to estimate this model and, therefore, the estimation process results in efficient estimators. Mathematically, the **Tobit Model** is expressed as :

$$y^*_{it} = \beta x_{it} + u_{it}$$

$$y_{it} = 0, \forall y^*_{it} \leq 0$$

$$y_{it} = y^*_{it}, \forall y^*_{it} > 0$$

$$u_{it} \sim IN(0, \sigma^2)$$

Where, y^*_{it} is the latent variable, y_{it} is the observed dependent variable, β is a (K × 1) vector of unknown parameters, X_{it} is a (K × 1) vector of explanatory variables, and u_{it} are the residuals which follow independently and normally distributed with mean 0 and variance σ^2.

As we assume one-year lag in the explanatory variables, the above model can be rewritten as :

$$y^*_{it} = \beta x_{i,t-1} + u_{it}$$

$$y_{it} = 0, \forall y^*_{it} \leq 0$$

$$y_{it} = y^*_{it}, \forall y^*_{it} > 0$$

$$u_{it} \sim IN(0, \sigma^2)$$

This model is also known as the *Censored Normal Regression Model* as the observations on y for which y = 0 are censored at the lower bound 0.

Both the Probit Model and the Tobit Model are estimated to identify the determinants of incidence and extent of R&D efforts respectively for a pooled dataset of 119 product groups over a period of six years. While the data on R&D efforts cover the period from 1994-95 to 1999-2000, that on the explanatory variables were taken for the period from 1993-94 to 1998-1999. The pooled dataset is expected to capture variations in the variables both across industries and over time. This relaxes the assumption made in cross-section analyses that same structure-conduct-performance-policy relationship prevails among all industries at one point of time. Further, this pooled data set also provides greater degrees of freedom and, therefore, raises efficiency of the estimates by increasing the sample size.

5. Estimation and Interpretation of Results

Incidence of R&D Efforts

Table 4 presents the regression results on the determinants of incidence of R&D efforts in Indian manufacturing sector. All the variables in the model appear to be statistically significant with expected signs of their coefficients. Further, the Likelihood Ratio is also statistically significant at the level of 5 percent, indicating that overall model is statistically significant.

It can, therefore, be said that the incidence of R&D efforts in an industry is determined by a set of structure, conduct, performance and policy related variables. While the probability of making R&D efforts by the firms in an industry is inversely related to the extent of market concentration (CON), capital intensity ratio (KIR) and industry level risks (IR), it is related directly to the size of the market (MSZ), intensity of purchasing foreign technology (FTP), extent of vertical integration (VI) and firm-level risks (FR).

Table 4: Regression Results for the Probit Model

Variable	Coefficient	Std. Err.	z	P>|z|
Constant	-1.989	1.202	-1.650	0.10
CON	-1.687	0.644	-2.620	0.01
MSZ	1.978	0.733	2.700	0.01
KIR	-2.820	0.837	-3.370	0.00
FTP	125.302	50.735	2.470	0.01
VI	24.976	5.648	4.420	0.00
FR	5.858	3.034	1.930	0.05
IR	-2.997	1.082	-2.770	0.01
Number of Observation = 714				
LR chi^2 (7) = 77.44				
Prob. > chi^2 = 0.0000				

This means that in industries with higher market concentration, though the firms have greater ability to spend for R&D, they become complacent of their market power. Similarly, in industries with higher

capital intensities, entry is restricted and competitive pressure is low. Likewise in industries with high risks, scope to gain from R&D is low and this makes the firms reluctant to spend for R&D. Therefore, in industries with greater market concentration or high capital intensity ratio or high level of variability in performance, the probability of making R&D efforts by the firms is low and vice-versa.

On the other hand, the industries with larger market size induce and/or encourage firms towards greater R&D efforts. Similarly, highly vertically integrated industries give the firms greater scope for diffusion of the innovation output across a larger range of products. Further, in industries where the firms spend more on purchasing foreign technology, R&D spending also increases to complement the former by developing indigenous technologies. The industries with higher variations in firm-level profitability compel the firms to make greater R&D efforts to raise their competitiveness and thereby to stabilize performance. This means that industries that have larger market or where the firms are largely vertically integrated or spend more on foreign technology purchase or experience higher variability in performance, the probability that they will make any R&D efforts is high and vice-versa.

Extent of R&D Efforts

Table 5 presents the results of the determinants of extent of R & D efforts. As in the case of incidence of R&D efforts, in this model too, the individual coefficients of all the independent variables are statistically significant at the level of 5 percent, except for CON, with expected signs. Further, the Likelihood Ratio is also statistically significant at 5 percent level. This means that the estimated model is also statistically significant.

Table 5: Regression Results for the Tobit Model

Variable	Coefficient	Std. Err.	t-value	P-value
Constant	-0.0016	0.0005	-3.06	0.00
CON	-.0.0002	0.0003	-0.67	0.50
MSZ	0.0011	0.0003	3.73	0.00
KIR	-0.0039	0.0005	-8.29	0.00
FTP	0.0645	0.0082	7.91	0.00
VI	0.0218	0.0022	10.08	0.00
FR	0.0029	0.0015	1.92	0.06
IR	-0.0032	0.0007	-4.34	0.00
Number of Observation = 714				
LR chi^2 (7) = 177.08				
Prob. > chi^2 0.0000				

As it is observed, for all the explanatory variables except CON, the relationship is the same as it was for incidence of R&D efforts. While KIR and IR have inverse relationship with the extent of R&D efforts, it is directly related to MSZ, FTP, VI and FR. This means that in the industries with high capital intensities or larger variations in industry-level performance, the firms will spend less on R&D and vice-versa. On the other hand, in industries with larger market size or higher spending on foreign technology or larger extent of vertical integration or greater variations in their performance, the firms will spend more

on R &D and vice-versa.

Interestingly, the coefficient of CON is not statistically significant. This means that market concentration does not have any statistically significant impact on the extent of R&D efforts by the firms. In other words, the firms make decisions on the extent of R&D efforts irrespective of the extent of market competition. The rationale for such proposition may be seen in the context of the underlying complexities in the relationship between market competition and extent of R&D efforts. For example, in an industry with higher market competition, on the one hand the firms have greater urge to spend more on R&D to raise competitiveness. On the other hand, in such an industry, lower profitability of the firms reduces their ability to spend for R&D. In balance, market concentration fails to create any significant impact on the extent of R&D intensity of the firms.

6. Summary and Policy Suggestions

Thus, risks have significant influence on both incidence and extent of R&D efforts of the firms in Indian manufacturing sector, while controlling for market concentration, size of the market, capital intensity ratio, intensity of purchasing foreign technology and extent of vertical integration. While firm-level risks encourages incumbents to put greater efforts on R&D to enhance their competitive strength, industry-level risks makes the firms reluctant for the same and force them to rely on equity linked technology transfer. As regards other determinants, market size, foreign technology purchase intensity and extent of vertical integration have positive impact on R&D efforts, whereas capital intensity affects the same inversely. Interestingly, market concentration has significant influence on the incidence but not on the extent of R&D efforts.

This raises an important question: what should be the policy resolutions to enhance in-house efforts by the firms? According to Kumar (2005), India needs to boost R&D activity through subsidies for specific projects, as apart from building capabilities, subsidies may also help in promoting industry's linkages with the public-funded research laboratories and universities. A number of studies (e.g., Lach, 2002; Gonzalez et al. 2005) find positive relationship between government subsidies and private R&D expenditure. But there are also studies (e.g., Wallsten, 2000; Busom, 2000) that show that subsidies not only fail to enhance private R&D efforts, but also crowd out public R&D expenditure.

This means that subsidies provided by the government as it is suggested are not enough to enhance R&D efforts by the firms. Along with subsidies, private R&D expenditure should be backed by an effective regulatory mechanism to control for industry level risks and increase in concentration in the market place. While controlling for risks at the industry level will make the firms confident and encourage them to spend more on R&D, regulation on monopolistic and restrictive business practices will raise willingness of the firms towards R&D.

(The author is thankful to Prof. Rakesh Basant for having some useful discussions on the paper. Usual disclaimers apply.)

References :

Basant, R. and Morris, S. (2000): *Competition Policy in India: Issues for a Globalising Economy*, Project Report Submitted to the Ministry of Industry, Government of India, New Delhi.

Busom, I. (2000): "An Empirical Evaluation of the effects of R&D Subsidies", *Economics of Innovation and New Technology*, Vol. 9, No. 2, pp. 111-148.

Gonzalez, X., Jordi, J. and Pazo, C. (2005): "Barriers to Innovation and Subsidy Effectiveness", *Rand Journal of Economics*, Vol. 36, pp. 930-950

Kumar, K. (2002): "Foreign Collaborations in India A Study of Patterns in the Pre and the Post-liberalisation Era", *Working Paper*, Indian Institute of Management, Lucknow.

Kumar, N. (2005): "Innovation Policy in a Globalizing Economy", *The Financial Express*, June 7.

Kumar N. and Agarwal, A. (2000), "Liberalization, Outward Orientation and In-house R&D Activity of Multinationals and Local Firms: A Quantitative Exploration for Indian Manufacturing", *RIS Discussion Paper No.* 07/20002.

Lach, S. (2002): "Do R&D Subsidies Stimulate or Displace Private R&D?" *Journal of Industrial Economics*, Vol. 50, pp. 369-390.

Mani, Sunil and M. Vijaya Bhaskar (1998). 'A Curmudgeon's Guide to Economic Reforms in India's Manufacturing Sector', *Economic and Political Weekly,* 19 December.

Mishra, P. (2005): *Mergers and Acquisitions in the Indian Corporate Sector in the Post-Liberalisation Era: An Analysis,* Unpublished Doctoral Thesis, Vidyasagar University, West Bengal.

Scheer, F. M. (2000): "Professors Sutton's Technology and Market Structure", *Journal of Industrial Economics*, Vol. 44, No. 2, pp. 215-23.

Sutton, J. (1991): "Sunk Cost and Market structure: price Competition, Advertising and the Evolution for Competition, MIT Press, Cambridge.

Tobin, J. (1958): "Estimation of Relationships for Limited Dependent Variable," *Econometrica*, Vol. 26, pp. 24-36.

Wallsten, S. J., (2000): "The effect of Government-Industry R&D Programme on Private R&D: The Case of Small Business Innovation Research Programme", *Rand Journal of Economics*, Vol. 31, No. 1, pp. 82-100.

Appendix I

Measurement of the Variables

In the present paper, the variables are measured with lags of three years to control for variations in number of firms covered in the dataset as well as to avoid the potential simultaneity bias among them[1].

R&D: R&D efforts by the firms in an industry are measured in terms of their R&D intensity, i.e., the ratio of R&D expenditure to sales. In other words,

$$R\&D_{jt} = \frac{\left(\frac{\sum_{i=1}^{n} RD_{i,t-1}}{\sum_{i=1}^{n} S_{i,t-1}} + \frac{\sum_{i=1}^{n} RD_{i,t-2}}{\sum_{i=1}^{n} S_{i,t-2}} + \frac{\sum_{i=1}^{n} RD_{i,t-3}}{\sum_{i=1}^{n} S_{i,t-3}} \right)}{3}$$

Where, $R\&D_{jt}$ stands for R&D intensity in industry j in period t, and RD_{it} is the total R&D expenditure by the i^{th} firm in the industry in period t and S_{it} is the sales of the i^{th} firm in the industry in period t.

CN: In the present paper, market concentration is measured by using the following formula :

$$CN_{jt} = \frac{\left(HHI_{j,t-1} + HHI_{j,t-2} + HHI_{j,t-3} \right)}{3}$$

Or,

$$CN_{jt} = \frac{\left(\sum_{i=1}^{n} s^2_{i,t-1} + \sum_{i=1}^{n} s^2_{i,t-2} + \sum_{i=1}^{n} s^2_{i,t-3} \right)}{3}$$

where, CN_{jt} and HHI_{jt} stand for market concentration and Herfindahl-Hirschman Index respectively for industry j in period t, and s_{it} for market share of the i^{th} firm in the industry in period t. The market share of a firm is defined as the ratio of the firm's sales to total industry sales. The value CN declines with increase in the number of firms and increases with rising inequality among any given number of firms.

MSZ: In the present paper, MSZ is measured as:

$$MSZ_{jt} = \frac{\log\left(\sum_{i=1}^{n} S_{i,t-1} + \sum_{i=1}^{n} S_{i,t-2} + \sum_{i=1}^{n} S_{i,t-3} \right)}{3}$$

where, MSZ_{jt} stands for the market size of industry j in period t and S_{it} is the sales of the i^{th} firm in the industry in period t.

KIR: We measure KIR by using the following formula:

$$KIR_{jt} = \left[\frac{\left(\sum_{i=1}^{n} \frac{CE_{i,t-1}}{S_{i,t-1}} + \sum_{i=1}^{n} \frac{CE_{i,t-2}}{S_{i,t-2}} + \sum_{i=1}^{n} \frac{CE_{i,t-3}}{S_{i,t-3}} \right)}{3} \right]$$

where, KIR_{jt} stands for the capital intensity ratio in industry j in period t, CE_{it} is the amount of capital

employed by the i^{th} firm in the industry in period t and S_{it} is the sales of the i^{th} firm in the industry in period t.

FTP: The ratio of expenditure on foreign technology purchase (FTE) to sales is used as a measure of foreign technology purchase intensity, i.e.,

$$FTP_{jt} = \frac{\left(\frac{\sum_{i=1}^{n} FTE_{i,t-1}}{\sum_{i=1}^{n} S_{i,t-1}} + \frac{\sum_{i=1}^{n} FTE_{i,t-2}}{\sum_{i=1}^{n} S_{i,t-2}} + \frac{\sum_{i=1}^{n} FTE_{i,t-3}}{\sum_{i=1}^{n} S_{i,t-3}} \right)}{3}$$

where, FTP_{jt} stands for foreign technology purchase intensity in industry j in period t, FTE_{it} is the foreign technology purchase expenditure by the i^{th} firm in the industry in period t and S_{it} is the sales of the i^{th} firm in the industry in period t.

VI: We measure VI as the ration of gross value added to sales, i.e,

$$VI_{jt} = \frac{\left(\frac{\sum_{i=1}^{n} VA_{i,t-1}}{\sum_{i=1}^{n} S_{i,t-1}} + \frac{\sum_{i=1}^{n} VA_{i,t-2}}{\sum_{i=1}^{n} S_{i,t-2}} + \frac{\sum_{i=1}^{n} VA_{i,t-3}}{\sum_{i=1}^{n} S_{i,t-3}} \right)}{3}$$

where, VI_{it} stands for extent of vertical integration in industry j in period t, VA_{it} is the gross value added by the i^{th} firm in the industry in period t and S_{it} is the sales of the i^{th} firm in the industry in period t.

FR: FR is measured by using the following formula:

$$FR_{jt} = \frac{\left(\sigma(RE_{i,t-1}) + \sigma(RE_{i,t-2}) + \sigma(RE_{i,t-3}) \right)}{3}$$

where, FR_{jt} is firm-level risks in industry j in period t and RE_{it} is the return of capital employed by the i^{th} firm in the industry in period t.

IR: FR is measured by using the following formula:

$$IR_{jt} = \sigma(RE_{j,t-1}, RE_{j,t-2}, RE_{j,t-3}, RE_{j,t-4}, RE_{j,t-5})$$

where, IR_{jt} is level of risks in industry j in period t and RE_{tj} is the return of capital employed in the industry in period t.

Household Perceptions of Climate Change in Leh

Bhagirath Behera[a] and Rahul T. Vaswani[b]

Ecologically fragile geographical areas most likely to be adversely impacted by climate changes are often inhabited by traditional communities dependent upon scarce natural resources for their livelihoods, which are often at subsistence or near subsistence levels. Hence, an understanding of these communities' perceptions and responses to climate change are essential to constructing effective sustainable development strategies that mitigate adverse impacts of climate change. With elevations ranging from 2700m to 7000m, and temperatures ranging from 30°C to -40°C, Leh is India's highest and one of its most arid, coldest and sparsely populated districts. We analyze the responses to a survey of 14703 households in the district of Leh, located in the Trans-Himalayan province of Ladakh, in Jammu and Kashmir State of India. We find that the perceptions of climate change are widespread and include observations of rise in temperature and heavy snow melt, less snow fall, heavy and untimely rainfall, biodiversity loss etc.

Introduction

The evidence of global warming is becoming abundantly clear with newly appearing reports on climate change. Sir Nicholas Stern's much publicized report on the economic impact of climate change – 'Economics and Climate Change'[1] – and the recent analytical report of the Intergovernmental Panel for Climate Change (IPCC)[2] offer elucidatory evidence of the climatic impacts associated with anthropogenically induced global carbon emissions. Several climatic analyses suggest that the geographical areas most likely to be adversely impacted by climatic changes are those that are already ecologically fragile, where inhabitant communities rely exclusively on scarce natural resources, such as mountain areas, edges of deserts, and small, low-lying, islands.[3] The reach and understanding of these reports on climate change, however, remain limited to the scientific and political communities that are engaged in devising strategies for climate change mitigation and adaptation.

Natural resource based communities, especially those that shall be among the first impacted by climatic variations because of global warming, are far removed from the ongoing scientific and political discussions. These overlooked communities are important stakeholders in the dialogue on the climate; without their clear understanding, participation, and equivocal agreement on climate change issues, no

[a]Assistant Professor, Department of Humanities and Social Sciences, Indian Institute of Technology, Kharagpur - 721302. Telephone: 03222-283630, Email: bhagirath@hss.iitkgp.ernet.in / bhagirath_b@yahoo.com

[b] Independent consultant on the issues of energy and sustainability, based at Oman, email: rahultv@gmail.com

1. Stern, N (2006)
2. IPCC (2007)
3. ibid

major action can be expected to be taken to effectively meet the climatic challenges we are likely to face – ecological degradation, demographic displacement, natural resource scarcity and resulting natural resource use conflicts.

Our analysis tries to provide an insight into the local perceptions of climate change in such an area of natural resource scarcity – focusing more importantly on its local understanding, as perceived through observed changes in local natural resource limits – and offers suggestions of how this understanding can become a useful platform for initiating community-driven actions for adaptation. It does not offer strategies for the inclusive process of dialogue on climate change, where communities need to be given the rightful importance of being integral stakeholders to the dialogue, but, rather, presents an understanding of the local comprehension of climate change, and discusses how this understanding may be useful to the arena of climate change mitigation and adaptation.

Scale/Location of the Study

The study is geographically limited to the district of Leh, located in the Trans-Himalayan province of Ladakh, in Jammu and Kashmir State of India. With elevations ranging from 2700m to 7000m, and temperatures ranging from 30°C to -40°C, Leh is India's highest and one of its most arid, coldest and sparsely populated districts.[4] Geographically Leh district is sandwiched between two Himalayan ranges – Zanskar on its west and Ladakh on its east. Across the eastern range are the great highlands of Leh district – Chang Thang – which extend along the south of Ladakh and west, over the Indian-Chinese border, into Tibet. To the north of Leh district is the district of Kargil amd beyond it is the Karokoram Range. The Indus River runs through Leh district from its south to its north, collecting the water of melting glaciers and straddling several high-lying villages along its banks. Geo-ecologically Leh district is divided into almost halves – a cold, arid desert with minimal precipitation in the northern half, and a high altitude grassland (Chang Thang) with perennial grasses in the southern half. Politically Leh is a tribal area governed autonomously by the locally elected and central-government supported Ladakh Autonomous Hill Development Council. Leh's predominantly agricultural and nomadic pastoral communities have sustained themselves through half a millennium, employing intricate and time-tested methods of managing their scarce natural resource base. This scarce resource base is replenished annually through mineral-rich streams originating in the rapidly declining glaciers of the Trans-Himalayan ranges, without which, sustenance in Leh would be extremely difficult. With diminishing glacial resources and increasing variations in climatic and ecological conditions, inducing impacts such as flashfloods and frequent locust attacks, Leh's communities are finding themselves more susceptible to changes in their traditional livelihoods and sustenance. While Leh's population growth has remained somewhat stable, as observed through decadal population enumerations, natural resource productivity has likely been adversely impacted by climatic changes, thus also necessitating the energy intensive import of foodgrains and consumptive resources from mainland India. This sustained and rather reinforcive process of energy intensive import and diminishing local production may result in an inter-temporal decrease in local sustainability.

Leh district is divided into six revenue blocks: Leh, Kharu, Khalatse, Nyoma, Durbuk and Nubra.

4. Humbert-Droz and Sonam Dawx (ed) (2004)

Leh block is the district's most urbanized block, with the district's highest concentration of population, literacy and availability of social services. It is also the administrative centre of the autonomous local government, and the hub for all socio-economic activities associated with tourism, governance, and the Indian Armed Forces. Agricultural activities have gradually diminished in Leh over two decades, with agricultural lands being converted into residential and commercial areas. The other blocks of Leh district – Kharu, Khalatse, Nyoma, Durbuk and Nubra – are rural, with Kharu, Khalatse and Nubra being largely agricultural, while the inhabitants of Nyoma and Durbuk are largely pastoralists. Given Leh district's large area, and thus large distances, the spread of urbanization from Leh block to the other blocks has been slow or minimal, with government offices and schools being the main medium of connectivity between the centre at Leh and the outer blocks.

Our analysis, while done at the household level, has been aggregated at the block level for practical reasons.

Study Details

The study relies primarily on the data collected through a comprehensive household survey conducted in Leh district between August 2006 and January 2007. Every household of Leh district was surveyed. In the survey questionnaire three questions relevant to the local perceptions of climate change were asked in the local language by trained Ladakhi surveyors. Each of these questions was explained in detail to the households, before their response was noted. These are: (1) compared to last one or two decades, do you notice any change in climate or environment / ecology in your region? (2) if yes, indicate the types of climate or ecological change?, and (3) how have these climate or ecological changes affected your livelihood?

This study analyses the responses to these questions and discusses its findings.

The Analysis

Table 1 presents the block-wise household responses to the first of the questions listed above. The responses show that over 80% of all households in Leh district perceive a climatic or local ecological change, at least within the last decade (1996-2006). The household responses from Leh block, the most urbanized area of Leh district, indicate that about 66% of the households perceive a climatic or ecological change, while in Kharu block, which is a predominantly agricultural area, about 96% of the households perceive such a change. It is observed that as the block becomes less agricultural or pastoral, fewer households in it perceive a climatic or environmental change. In Kharu, Khalatse and Nubra blocks, all with Ladakh's highest concentration of agriculturally dependent households (see Table 1A), over 93% of all households on an average indicate a perception of climatic or ecological change. In Durbuk and Nyoma blocks, where inhabitants are primarily livestock herders (see Table 1A), an average of about 84% of the households indicate such environmental change. These findings indicate that the greater the dependence on, or need for managing, scarce natural resources, the more acute is the perception of ecological impacts in Ladakh. This also corroborates well with our anecdotal information, where pastoral and agricultural households have shared their observations on the increasing scarcity of water resources which are crucial for the renewal of perennial grasses for grazing in the highlands of Nyoma and Durbuk blocks, and for the optimum yield of crops grown in Leh district's short cropping season.

Table1. Household Perception of Climate Change: Compared to the last one or two decades, do you notice any change in the climate or environment in your region?

Block Name	Total No. of Households	Percentage (%)		
		Yes	No	Don't Know
Leh	6299	65.87	32.75	1.38
Kharu	1341	96.77	2.70	0.53
Khalatse	2245	94.22	3.81	1.97
Nyoma	1176	85.86	8.34	5.80
Durbuk	725	88.10	11.76	0.14
Nubra	2917	90.71	8.23	1.06
Leh District	**14703**	**80.59**	**17.80**	**1.61**

Source: Gyurja Project - Ladakh Autonomous Hill Development Council Household Survey 2006

Table1A. Percentage Distribution of Household Responses for: Sectors of Employment for the Main Income Earner in the Household (More than one response is possible for a household)[5]

Block Name	Percentage (%) Distribution of Reponses for: Sectors of Employment for the Main Income Earner in the Household							
	Own Farm Activities	Livestock Rearing	Labourer	Employed (Salaried)	Tourism and other Business	Army	Traditional	Other
Leh	33.31	15.47	11.39	51.81	13.10	7.92	1.32	14.17
Kharu	65.53	29.55	28.27	27.21	5.97	12.40	1.59	14.97
Khalatse	64.81	34.64	23.78	32.41	7.49	9.95	2.51	12.64
Nyoma	49.44	52.20	28.99	22.95	3.88	1.90	1.64	8.71
Durbuk	48.53	41.82	36.50	21.68	4.34	5.17	0.98	9.93
Nubra	62.22	35.70	38.98	27.04	6.44	7.43	0.95	14.05
Leh District	**48.76**	**27.89**	**22.89**	**37.94**	**9.11**	**7.92**	**1.46**	**13.34**

Source: Gyurja Project - Ladakh Autonomous Hill Development Council Household Survey 2006

A more detailed analysis of household perceptions of the different types of climate changes is presented in Table 2; this table analyses responses to the second question listed above. The most obvious observation of climatic change by households throughout Leh district is the change in precipitation patterns – heavy and untimely rain, and less snowfall – along with increasing ambient temperatures that are leading to quicker snow melt, and thus a shorter season of flowing streams.

Less snowfall results in a slower recharge of ground water and springs, and a quicker drying up of scare water resources even if population and per capita consumption pressures remain stable. As has been discussed before, flowing water emanating from annually replenished glacial sources and springs is the only source of drinking water in Ladakh and the lifeline of Ladakhi agriculture, which is, on average,

5. 'Labourer' includes agricultural and non-agricultural labourer; 'Employed (salaried)' includes government service and private service; 'Tourism and other business' includes tourism, guest house and small business; 'Traditional' includes traditional medicine practitioner (Amchi), driver, servent and other.

the main occupation of more than 58% of Leh district's citizens outside of Leh block. In more remote areas, agriculture and livestock rearing are not only the main occupation but also the main source of sustenance. An average of almost 48% of households in Kharu, Khalatse and Nubra blocks - mainly agricultural blocks - have observed the reduction in annual snowfalls.

Tourism is also becoming an increasing source of annual government revenue and private income in Ladakh. Ladakh is popular globally for its breathtaking landscape, composed of majestic snow capped Himalayan peaks and scenic, culturally preserved, villages amidst pristine glacial valleys, which attract many tourists to the region each year. Climatic changes that are impacting this landscape are also likely to affect the tourism economy. The rise in ambient temperature and heavy snow melt in Ladakh, as observed by the households, can be confirmed by widely acknowledged anecdotal information that indicates that glaciers such as Siachen, Khardong and Stok in Ladakh – all well known for their strategic and scenic locations – have either receded or almost disappeared in about a decade (1996-2006).

Leh district receives about 20 mm rainfall in a year, which has risen nearly ten times in the past few years[6]. As is seen in the analysis in Table 2, over 73% of all households in Leh district have perceived similarly about the increasing intensity of rainfall, through their own observations of climatic changes. This heavy and untimely rain has, in recent years, caused great amount of damage to private and public property due to landslides and flash floods. The recent flash floods of August 2006 destroyed homes, bridges and roads, cutting off villages from sources of communication and assistance, and inundated fertile fields with rock and sand, rendering them unsuitable for further cultivation. Such climatic occurrences also significantly reduce the resilience of Ladakhi households to withstand other socioeconomic and ecological changes. Since most homes in Ladakh are made of mud bricks and wood, local anecdotal information reveals that the large majority of homes suffered partial to severe structural damage due to the intensity and duration of rainfall. As can be understood easily through field observations, traditional homes in Ladakh have been designed with much ecological and climatic wisdom - to withstand the forces of the elements and to last for the needs of several generations. However, the recent unpredictable climatic changes are proving to be unfaced challenges that require the adoption of energy intensive and little understood construction practices, imported from mainland India, that pose more harm than good to the fragile Ladakhi landscape. In addition such adoptions create a large economic burden on many families socioe-conomically unaccustomed to devoting the large part of their lives towards collecting the required resources to build homes.

6. Sethi, A (2007)

Table 2 Block-wise Household Perception of the Different Types of Climate/Environmental Change

Block Name	Percentage of All Households in Leh District Responding the Following Perceived Environmental Changes						
	Heavy and untimely rain	Frequent occurrences of floods and landslides	Rise in temperature and heavy snow melt	Loss of biodiversity	Occurrences of new diseases	Less snow fall	Other climatic or environmental problems
Leh	61.41	27.94	34.42	1.44	2.21	36.89	0.25
Kharu	87.75	33.96	45.60	2.93	2.70	49.14	0.23
Khalatse	87.13	35.92	47.76	3.50	5.87	50.67	0.18
Nyoma	74.98	21.42	44.95	2.63	7.02	38.37	4.04
Durbuk	76.06	15.86	38.24	2.97	5.95	31.02	3.82
Nubra	80.35	36.87	44.14	1.34	6.86	42.97	0.51
Leh District	**73.33**	**30.41**	**39.60**	**2.04**	**4.30**	**40.78**	**0.69**

Source: Gyurja Project - Ladakh Autonomous Hill Development Council Household Survey 2006

The third part of our analysis studies the perceived magnitude of the impacts of climatic changes in people's lives and livelihoods. The analysis, presented in Table 3, shows that almost 72% of all households in Leh district feel that climatic changes have affected their livelihoods in some way. As observed earlier, this perception is stronger in agricultural and pastoral areas, than in urban areas. Notably, almost a quarter of all households in Kharu and Khalatse feel a serious impact on their livelihoods. Even within Leh, a largely urban block, the more rural, agricultural villages have reported being seriously affected by climatic or ecological changes. In Nang village of Leh block, for example, farmers have complained that they do not get enough water to irrigate their crops during the peak irrigation period time; as a result, the village incurs heavy crop losses each year. According to several surveyed households, despite a well functioning *Churpon* system – an efficient and effective traditional water managing social institution that employs the use of equitable water distribution depending on the slope, the area to be irrigated, etc – their village faces severe water scarcity which is attributed to heavy runoff of water from faster snow melt. It is important to note that the run off water enters into the Indus River and flows downstream into lower lying regions. Ladakhis have traditionally not relied on the Indus for irrigation due to its low depth, the low quality of its water and the great difficulty in lifting water from its levels without the use of polluting, energy inefficient, mechanized pumps. The altitude and climate of Ladakh pose great mechanical challenges often not experienced in any permanently inhabited part of the world.

Table 3. Household Perceptions of How Seriously Climate / Environmental Changes Have Affected their Livelihoods

Block Name	Very Seriously Affected	Seriously Affected	Slightly Affected	Not at all Affected	Cannot Say
Leh	1.02	10.56	46.45	7.78	34.20
Kharu	3.28	23.56	58.76	10.22	4.18
Khaltse	2.81	24.99	60.67	5.26	6.28
Nyoma	0.17	6.04	72.19	4.59	17.01
Durbuk	0.28	4.00	71.59	10.07	14.07
Nubra	2.13	13.54	61.50	13.40	9.43
Leh District	**1.61**	**13.85**	**56.03**	**8.59**	**19.91**

Source: Gyurja Project - Ladakh Autonomous Hill Development Council Household Survey 2006

Heavy snow melt is also impacting the livestock economy of Leh district. Our interaction with nomadic pastoralists in Kharnak village in Nyoma block indicated to us that the disappearance of snow from the surrounding mountains has led to reduced grass yields important for grazing. As a result, the pastoralist groups now move more frequently from one place to other, in search of grazing lands, as compared to a decade earlier. This has further impacted the regenerative ability of the highlands. Thus, what used to be a traditional and lucrative occupation for many generations of livestock herders is being reduced to a source of increasing penury. According to the inhabitants of Kharnak village, while more than 60 families were involved in pastoral activities until only a few years ago, the number of such families has reduced by 50 percent. Pastoralist families have migrated from Nyoma and Durbuk blocks to Leh town in search of better economic opportunities within the tourism economy and its allied sectors.

Another impact of climatic changes has been the increase in the frequency and intensity of pest attacks. The recent (2006) devastating invasion by locusts, both in magnitude and duration, in Nyoma and Durbuk blocks, is perceived by inhabitants of villages such as Anlay, Rongo, and Kuyul in these blocks as a consequence of the rise in temperatures in the region. It has been noted by the agricultural extension office and the Field Research Laboratory at Leh that the frequency of such pest attacks can be attributed to warmer temperatures which are conducive to the increase in the geographical range and the duration of infestation of such agricultural pests.[7]

Conclusion and Policy Implications

It is clear that most of Leh district's citizens have a clear perception of climatic or ecological changes in their region, even if they are not aware of the scientific basis of climate change or global warming. It is also evident that people with a greater proximity to, and need for, managing natural resources in Leh district have a stronger, or more resolute, perception of such climatic changes.

Ladakhis, as we have noted earlier, have sustained themselves for at least half a millennium of documented history, on their region's scarce resource base, amidst a climatically challenging environment. They have developed ingenuous ways of efficient natural resource management, through the accumulated wisdom of many generations of experience. However, recent social, economic and ecological changes are damaging this fabric of Ladakh's sustainability. While we do not address here the myriad social and economic reasons, we do partially analyse the impact of ecological changes on people's livelihoods. Loss of livelihood and biodiversity, increasing scarcity of lifeline resources such as clean drinking water,

7. Anecdotal information, based on interactions with agricultural officers and ecological researchers stationed in Leh.

increasing migration from remote rural areas to urban Leh town changes in primary occupations, construction practices, and socio-economic living habits are only some of the complex interrelated impacts of climatic and ecological changes in Leh district. In our understanding, these environmental changes are the precursors to many socio-economic impacts, and thus deserve greater attention than they presently receive.

Throughout Leh district, it is observed that the Ladakhis are keenly aware of, and are articulating, these observed environmental changes that are impacting their lives. Moreover they are taking individual and, at places, small concerted village scale efforts to adapt to these environmental challenges. The actions for mitigation and adaptation to climatic impacts require concerted efforts at much larger, more significant scales, such as we observe at the regional, national and international level, however, governments ultimately depend on the efforts of local communities to undertake these mitigative and adaptive actions. Leh district is somewhat representative of such communities that are already primed, through social-ecological interactions and ecological management wisdom, to detect the magnitude and scale of climatic impacts on their local environment; they are, in several ways, the first source of information and the first line of meaningful action on climate change. It is, thus, pertinent to involve such communities through their articulate representatives to inform and participate in the dialogue on the global environment. It is, after all, these natural resource dependent communities, with acute perceptions of social-ecological relationships that stand to be most immediately and greatly affected by environmental changes though anthropogenically induced climatic changes.

It is hoped that our study throws some light on the ability to capture local perceptions, in ecologically fragile regions with marginalized populations, on the social, economic and ecological impacts of climatic changes. This understanding of local perceptions is intended to inform the debate on climate change, and more importantly, instigate public citizens, policy makers, organizations and researchers to make informed, concerted and strategic decisions for mitigation and adaptation. As such, the Ladakh Autonomous Hill Development Council is the one of the primary actors who stands to benefit from this analysis of the climatic perceptions of its citizens.

No sustainability study can be complete without a detailed analysis of the complex interrelated social, economic and ecological factors governing the scale of its study. Our study too necessitates a more detailed understanding of these factors, including comparisons with historical data wherever possible, which we hope to present in more detail in our subsequent analyses.

References :

Humbert-Droz and Sonam Dawa (ed) (2004), *Biodiversity of Ladakh: Strategy and Action Plan*, Sampark, New Delhi.

IPCC (2007), *Climate Change 2007: The IPCC Fourth Assessment Report*, Intergovernmental Panel on Climate Change, Cambridge University Press, New York.

LAHDC (2006), *Household Survey Report,* Ladakh Autonomous Hill Development Council, Leh, Ladakh, Jammu and Kashmir.

Sethi, A (2007), " India's heritage feels the heat too", *Times of India,* June 13, Kolkata..

Stern, N (2006), *The Economics of Climate Change: The Stern Review*, Cambridge University Press, London.

Corporate Social Responsibility : Emerging Issues in Globalizing India

Priyasha*

Until very recently it was commonly perceived that CSR practices are restricted only to the corporate houses that are already in business. However, in recent years many industrial projects in India have experienced a lot of protests and resistance from people against acquisition of land for new corporations resulting in large-scale violence in many parts of the country. Proper designing of CSR practices by the firms that are being newly set up may be able to reduce this resistance of the common mass against land acquisition for industrialization. Thus, CSR practices are as important for the upcoming business houses as for the existing ones. The present paper attempts to analyze the existing CSR practices and to develop an alternative framework of CSR practices for the new corporations that can deal with the issues of compensation, resettlement and rehabilitation, job security, ecology and environment with specific reference to two cases of people's movement against land acquisition in India.

Introduction :

Corporate social responsibility (CSR) has become one of the major issues of concern for both the academicians and practitioners (Smith, 1996; Jones 1997; Griffin and Mahon, 1997; Waddock and Graves, 1997; Maigan and Ferrel, 2001; Maigan and Ralston; 2002, Graafland et al, 2003; Durrant, 2006). Until very recently it was commonly perceived that CSR practices are restricted only to the corporate houses that are already in business, though they can range from community development (Vyakarnam, 1992; Biggs and Messerschmidt, 2005) to environmental management (Vyakarnam, 1992; DesJardins, 1998; Dummet, 2006; Maniknandan, Ravichandran and Williams, 2007; Cetindamar and Husoy, 2007), from human capital management to education and training (Vyakarnam, 1992), from social welfare (Vyakarnam, 1992) to occupational health, safety and welfare of the workforce, etc . However, in recent years many industrial projects in India have experienced a lot of protests and resistance from people, especially against acquisition of farmland for setting up new industrial units resulting in large-scale violence in many parts of the country (Bhaduri, 2007; Sarkar, 2007; Fernandes, 2007).

Such resistance from the affected people against land acquisition has been heatedly debated on various issues, such as compensation, resettlement and rehabilitation of the affected people, the politics involved in the protests and resistance, process of land acquisition, economic transition from agriculture to industry, and above all convincing the people about the benefits of the industrial projects for the society (Sarkar, 2007). While most of these issues are very important in the present context, there are a few important questions that need to be addressed. Can a better and well-structured corporate social

*Research Scholar, Department of Humanities and Social Sciences, Indian Institute of Technology, Kharagpur-721302, email: hipriyasha@rediffmail.com

responsibility (CSR) strategy resolve the issues relating to land acquisition? Is there a mismatch between the expectations of the society from the corporates and the provisions made by them for the society? Can well-designed CSR practices bridge this gap? Should compensation, rehabilitation and resettlement for the displaced come under the purview of CSR practices for the upcoming firms? How to ensure that the firms follow CSR norms in practice?

The present paper attempts to address these issues by analyzing the existing CSR practices and suggesting for an alternative framework that can deal with compensation, resettlement and rehabilitation, livelihood, job security, ecology and environment. This is based on two recent striking events of people's resistance against land acquisition for setting up industrial units, viz. the small car project of Tata Motors in Singur, West Bengal and the proposed steel plant of the South Korean steel giant, Pohang Steel Company (POSCO) in Jagatsinghpur, Orissa. The rest of the paper is organized in the following way: Section 2 gives an overview of the importance of CSR in the era of globalization. Section 3 discusses the two cases of land acquisition for industrialization in India and brings into light the critical issues involved therein. Section 4 finally concludes the paper.

2. CSR: A Conceptual Overview

Globalization may be described as a process by which the people of the world are unified into a single society and function together. This process is a combination of economic, technological, socio-cultural and political forces. Today, many socio-economic phenomena such as peace, crime, migration, production, employment, technological developments, environmental risks, distribution of income and welfare, etc, are being affected by the process of globalization.

With rapid socio-economic changes and the process of liberalization and globalization leading to increase in the nature and extent of market competition across the economies, the corporate houses aim at reducing their operation costs to remain competitive at the market place. In order to meet these objectives, these corporate houses often neglect the interest of the society, one of their important stakeholders of the business. This results in external costs to the stakeholders and litigation costs and diminished brand value to the firm itself. Under these circumstances, following of ethical, environment friendly and socially responsible business practices is very important for the firms (Taka, 2007). Accordingly, corporate social responsibility (CSR) has become an integral element of corporate governance. Further, organisations, such as the UN, the Organisation for Economic Cooperation and Development (OECD) and the International Labour Organisation (ILO), have developed compacts, declarations, guidelines, principles and other instruments that outline norms for acceptable corporate conduct.

The very existence and growth of a business rely largely on the society within which it operates. Businesses operating in a community benefit from the infrastructure of that community, such as the roads, other transport infrastructure, the police, firefighters, safe or clean environment, etc. They also draw their resources, i.e., the raw materials, the workforce, etc, from the community. Thus, businesses have an obligation towards the well-being of the society wherein they operate. CSR recognizes the inter-dependence between the business and the society and it can be regarded as a means to deliver on that obligation for the mutual benefit of both.

As the concept is still evolving, a single universally accepted definition of CSR does not exist

(Kercher. 2006; Cetindamar and Husoy, 2007). The World Business Council for Sustainable Development (WBCSD) defines CSR as "The continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large". Corporate social responsibility may also be defined as a concept by which organizations consider the interests of the society by taking responsibility for the impact of their activities on customers, suppliers, employees, shareholders, communities and other stakeholders, and the environment[1].

Importance of CSR for Companies

In the globalization era, CSR has become an indispensable element in the various executive decisions of the organizations. In the present day world, companies are fast realizing that in order to stay productive, competitive, and relevant in a fast changing business world, they have to become socially responsible. While globalization has brought vast changes in the corporate environment, the companies are determined to increase their ability to manage their profits and risks and to protect the reputation of their brands. A company's relationship with its workers, the community in which it operates, and the marketplace, may greatly contribute to its sustainability. Thus, CEOs around the world increasingly believe that they have a strategic rationale for taking on environmental, social and governance issues. From philanthropy or charity, CSR has now come to be embedded in the corporate strategies (Falck, Heblich, 2007). An increasing number of companies are now viewing CSR as a comprehensive set of policies, practices and programs that are integrated throughout the business operations, and supported and rewarded by the top management (Carrasco, 2007). Many corporations are now incorporating CSR into their codes of conduct, seeking to work closely with NGOs in formulating corporate strategies in under-developed countries, subscribing to the UN Global Compact and other UN initiatives, etc (Kercher, 2006; Cetindamar and Husoy, 2007). The CSR debate largely revolves around the conduct of multinational corporations and other large private companies which have the ability to significantly influence domestic and international policies and the communities in which they operate because of their size (Kercher, 2006).

There exists a large body of literature that deals with how the importance of CSR for the companies has evolved over the years. Economic responsibility is the highest priority for the executives in the USA, followed by the legal, ethical and the discretionary CSR components (Aupperle et al; 1985). Dierkes (1980) and Longnecker (1985) found that in Germany while quality, profit and growth remained the top priority, "quality of life" issues were gaining importance. Moore and Richardson (1988) and Cowton (1987) found that the main responsibility of the business in the U.K. was seen as producing goods and services and obeying the law. Pinkston (1991) reported an increased significance of the legal and ethical components of CSR in Germany, Sweden and USA. Pinkston and Carroll (1996) observed that economic and legal responsibilities were perceived as almost equally important, and that ethical responsibilities had gained greater importance at the expense of philanthropic responsibilities. Maignan and Ralston (2002) observe that there exist differences in the underlying motivations for CSR, categorized as performance-driven, stakeholder-driven and value-driven. O'Dwyer (2003) identified three partially overlapping rationales driving the acceptance of corporate responsibilities by the firms, i.e., pro-active enlightened self-interest, reactive enlightened self-interest and obligations/duties.

1. For details see www.wikipedia.org

Further, the focus of CSR is also being widened to find out solutions for sustainable management of natural resources so that the negative impacts of corporate activities on the environment are reduced. Many citizens, environmental organizations and corporate leadership now consider environmental responsibility as part of a comprehensive approach to a company's operations, products and facilities that includes assessing business products, processes and services; eliminating and/or minimizing waste and emissions; maximizing the efficiency and productivity of all assets and resources; and minimizing practices that might adversely affect the availability of resources for future generations. With increasing economic costs of environmental clean-up and waste treatment and resulted effects on company's business performance corporate environmental responsibility in terms of sustainable management of environmental resources has become vital for the firms.

Corporate environmental responsibility (CER) is driven by several factors. Among them, most prominent are intense pressure from consumers, government legislation, enhancing the company's reputation, avoiding risk of accident or environmental threat etc (Dummet, 2005). Again the importance of carrying CER projects differs between national and multinational companies. Multinational corporations face levels of environmental and social responsibility higher than their national counterparts primarily because of the two mechanisms of international reputation side effects and foreign stakeholder salience (Zyglidopoulos; 2002).

Impact of CSR

The nature and extent of CSR benefits for an organization may vary depending on the nature of the enterprise. CSR activities may benefit the companies in the following ways:

Corporate Financial Performance

CSR is expected to influence customer perceptions in favour of the product or service offering and in the end is likely to affect corporate financial performance positively. In other words, there exists a positive relationship between corporate social performance and corporate financial performance (Abratt and Sacks, 1988; Russo and Fouts, 1997; Waddock and Graves, 1997). As the CSR activities of the companies can cause brand differentiation and can increase consumer loyalty, this may further result in increasing the sales value of those firms leading to higher financial performance. In cases of product strengths and financial returns, corporate social performance precedes corporate financial performance (Scholtens; 2008). Further, high social performance generally leads to higher profits (Simpson and Kohers; 2002)[2].

Risk management

Managing risk is the central part of many corporate strategies. Reputations that take decades to build up can be ruined in hours through incidents such as corruption, scandals or environmental accidents. These events can also draw unwanted attention from the regulators, courts, governments and media. Building a genuine culture of 'doing the right thing' within a corporation can reduce these risks to a large extent (Kytle and Ruggie; 2005).

2. However, there are also evidences that postulate a negative relationship (Vance, 1975) or no relationship (Aupperle et al, 1985) between CSR and business performance. But the more recent studieds largely provide empirical support in favour of positive relationship between the two.

Brand differentiation

Companies strive for a unique selling proposition that can separate them from the competitors in the minds of consumers. CSR plays an important role in building customer loyalty based on distinctive ethical values (Paluszek; 2005) and therefore could be an effective marketing tool for the company (Smith, 1996). Consumers are becoming more aware of the environmental and social implications of their day-to-day consumer decisions. Thus, when the consumers are aware that the companies from which they are making purchases are ethically, socially and environmentally responsible, their loyalty towards those companies will increase.

Human resources

CSR can be seen as an aid to the recruitment and retention process of a company. Potential recruits often ask about a firm's CSR policy during an interview, and having a comprehensive policy can give a distinct advantage in this regard. This helps the companies in attracting more talented and committed employees (Maignan et al, 1999). CSR can also help to improve the perception of a company among its staff, particularly when staff can become involved through fund raising activities or community volunteering (Bhattacharya, Sen and Korschun, 2008).

License to operate

It is the imperfect market that provides the firm with an opportunity to gain above normal profit and inducement to behave ethically both for reasons protecting above normal profits and also because they are driven by higher ethical standards. Further, a firm in an environment of high growth economic activity is more likely to use its gains from market power in a pro-active ethical and social manner where it can gain competitive advantage in terms of customer loyalty, preferential availability of capital and other factors of production, and, a higher level of public trust and community goodwill (Sethi and Linda; 1998). Under imperfect competition, when the firms are gaining above normal profits, the Government enters the market to put in restrictions on the firms through taxation or regulations. However, corporations are keen to avoid interference in their business. Thus, by taking substantive voluntary steps, they can persuade governments and the public that they are taking issues such as health and safety, diversity or the environment seriously, and so avoid any intervention by the Government or pressure groups.

Ecological impacts

Use of eco-friendly technologies, through research and development and technological innovation for the production of people-friendly products which are safe for the environment may also be an impact of the CSR policies of the firms. Minimizing the impact of business activities on local communities is one of the most important aspects of corporate social responsibility. Thus, various firms with their community relation measures reassure the local residents by discussing with them about the environment related activities of the firms. Public pressure as well as Governmental legislations may force the firms to adopt cleaner production (CP) techniques, environmental accounting (EA), environmental management systems (EMS), etc., to evaluate their overall environmental performance.

CSR in India:

CSR has always been part of Indian business tradition, though it was not highlighted earlier as it

is understood or defined today. In its early phase, the Indian CSR agenda used to be characterized mainly by philanthropic and community development activities. With the deregulatory economic policies changing the business environment and the business practices by the firms, there are increasing pressures on the companies from civil societies, consumers, NGOs and the markets (both for inputs and output) to adhere to social and environmental norms. The businesses are expected to address the issues like ethical governance, environmentally-sound practices, observance of human rights, eradication of poverty, etc (Vyakarnam, 1992). As a result, CSR is receiving increasing attention from various corners.

Table 1: Status of CSR practices by leading business houses of India.

Company	Income Generation & Poverty Alleviation	CD	Education	Health	Promotion of Sports, Arts & Culture	Woman & child welfare	Rehabilitation & Resettlement	Adhering to UN's Global Compact	Environment Protection & Management	Health, Safety & Welfare of Employees	Women Empowerment
Tata Group		?	?	?	?	?			?	?	
NTPC		?					?	?	?		
BHEL								?	?	?	
Bajaj Auto Limited	?	?	?	?					?		?
Reliance Energy		?	?	?		?			?		
Reliance India Limited		?	?	?	?				?	?	?
ONGC		?	?	?	?	?		?	?	?	
Hindustan Unilever Limited		?	?	?				?	?		?
Aditya Birla Group	?		?	?		?			?		?
ACC Limited		?	?	?	?			?	?	?	
Larsen & Toubro Limited			?	?					?	?	?

Source: website of the respective company.

Table 1 shows the CSR practices of some selected business houses operating in India. It is observed that the CSR practices of these enterprises include community development, environmental management and protection, promotion of education and health, occupational health, safety and welfare of employees, etc. Further, few companies are also engaged in CSR activities such as women empowerment, income generation and poverty alleviation, promotion of sports, art and culture, woman and child welfare, adhering to UN's Global Compact principles, etc.

It may be noted that all the selected business houses undertake environment management and protection as their CSR practice. The CER practices of these business include pollution prevention, energy efficiency, usage of alternative sources of energy and eco-friendly technologies, implementation of EMS and other environmental policies, waste and sewerage management, afforestation and creation of Green

Belts, watershed management, conservation of resources, etc.

Interestingly, the issues like rehabilitation and resettlement of the affected people are ignored by all the houses except NTPC. Such a large-scale exclusion of rehabilitation and resettlement from their CSR practices by the major Indian corporate houses over the years has resulted in loss of confidence on the part of the community, especially the affected people. They have failed to relate themselves with the projects, eventually resulting in strong resistance against land acquisition for the upcoming industrial projects.

3. Land Acquisition for Industrialization and CSR: Cases from India

The present section discusses the two recent striking cases of people's resistance against land acquisition for setting up industrial units. While the first case refers to the acquisition of farmland for the proposed steel plant of the South Korean steel company, POSCO in Jagatsinghpur of Orissa, the second case refers to the land acquisition for the small car project of Tata Motors in Singur of West Bengal[3].

Case 1: Land Acquisition POSCO Steel Plant, Jagatsinghpur

On June 22, 2005 POSCO and Government of Orissa entered into an agreement with POSCO for the latter's proposed steel plant in Jagatsinghpur with investment of $12 billion (around Rs 48,000 crores) and production capacity of around 12 million tonnes per annum[4]. This is the largest ever single foreign direct investment in the country. According to the MoU signed between the state government and POSCO, the plant of 3 million tonnes capacity is likely to be built in the first phase and the capacity is expected to expand to 12 million tonnes subsequently. The project was approved with "Special Economic Zone[5]" (SEZ) status in 2006.

The project requires a land area of 4,004 acres in three panchayats of the district, viz., Gadakujang, Dhinkia and Nuagaon, affecting 471 families. The cash compensation offered by the company is based on the magnitude of loss of property following a socio-economic survey in the proposed project site. It includes Rs.5 lakhs to each of the families losing their land completely and Rs. 2 lakhs to those losing their land partially. Opportunities are also likely to be made available by the project authorities to provide vocational training to members of the displaced families, availability of shops and service units and housing assistance to the tune of Rs. 2, 00,000 to each of the displaced families in lieu of resettlement habitat[6].

POSCO-India has also ascertained to extend full support and work with the Orissa government to spearhead social responsibility programs in the state. Some of the identified areas on which work is to

3. Resistance against land acquisition in Singur eventually forced Tata Motors to relocate the project in Sanand of Gujarat.
4. For details see *Radical Notes*, July 5, 2007.
5. Special Economic Zones (SEZ) are specially demarcated geographical regions that have more liberal economic laws as compared to the centralized laws of the country. The very purpose of a SEZ is to develop the area by following special economic policies. The SEZ Act 2005 announced the policy for setting up of any special economic zone in India. This Act has set the guidelines and procedures for this purpose.
6. For details see www.posco-india.com

begin are education and healthcare sector. POSCO-India has initiated programs like POSCO-TJ Park Foundation Scholarship to promote education. For betterment of the local people it has conducted a Cleft lip and palate correction camp where patients from Jagatsignhpur have been given expert medical treatment by a specialized team from Korea and senior professors from SCB Medical College, Cuttack. The company has also launched a 'Villagers Friendly Program' for the benefit of local people. A detailed corporate social responsibility plan is currently being worked out which will include in -depth inputs from the Government of Orissa and other relevant bodies[7].

Despite such compensation package and CSR practices of POSCO-India, while 1,135 acres of land have been acquired so far and many of the affected families have already received compensation, the project faces a strong resistance against acquisition of land. The POSCO Pratirodh Sangram Samiti has been on an anti-displacement agitation for the last two-and-a-half years against. A number of political outfits have extended their support to the Samiti in favour of the movement. The disputes over land acquisition and delays in allocating mining licenses have stopped POSCO-India from proceeding further. Although, work was scheduled to start in April 2007, the company is yet to start building the plant even.

A critical scrutiny of the POSCO-India case gives some interesting insights. First, proposed project site is situated at the mouth of the Mahanadi, the longest river of Orissa with catchment area covering 1,25,000 square kilometres. The POSCO plant is expected to destroy the complex system of myriad natural creeks and waterways and to create a vast backwater of Mahanadi and its associates especially during the rainy season and floods. Further, nearly 3600 acres of the land assigned for the project is categorized as forest land and is dotted with betel vines, cashew plantations and prawn farms set up by the local people. The POSCO project is expected to squash all that and is likely to result in an ecological disaster in the East Coast of Orissa[8].

Second, although the State Government and POSCO-India claim that 471 families will be displaced for the project, according to the Census Report 2001, the three panchayats in the project site have 3,350 households with 22,000 family members. Thus, the number of people to be uprooted from their land, culture and community for the project is much higher than what the State Government or the company claims. Such a large-scale displacement of people will not only make the villagers alienated from their own society, helpless and vulnerable, it will also put their livelihood at stake. Around 500 people from the affected villages have already migrated to other parts of the state and also to the states like Maharashtra, Andhra Pradesh and Punjab in search of their livelihood even before the project work begins.

Third, the proposed project site is located near the Bhitarakanika Mangrove forests (which has now got the status of a sanctuary). Apart from fears that land for the plant will encroach upon the mangroves leaving the state's coastline vulnerable, there is also a fear that the plant will draw water from a watershed that feeds the sanctuary. Besides, the project will require 286 million liters of water per day which will be extracted from Jobra and Naraj barrages of river Mahanadi. This is likely to pose a great deal of threat on water supply in the irrigation canals of Cuttack, Jagatsinghpur, and Kendrapada, in addition to concerns about water pollution and water security for the locals.

7. For details see www.posco-india.com
8. For details see *Radical Notes*, July 5, 2007.

Fourth, as the POSCO project will include a captive power plant, a private port and its township, this entire area will be raised a few feet above sea level – destroying the natural contours of the land, and depriving rainwater of natural rivulets that flow down to the sea. As a result, water is likely to stagnate within coastal islands where dense human population and cultivation are found thereby displacing more than 500 villages and leaving their inhabitants homeless and landless.

Sixth, the project economy is thriving, labour-intensive and based on agriculture and fishing. It is quite rich in cash crops like betel vines, cashew, etc. that provide livelihood to hundreds of families throughout the year. An average family involved in cashew farming earns about Rs. 20,000 per season. About 50% of the families are also involved in pisciculture (mostly prawns) and the daily earning per family from this activity ranges between Rs. 100 and Rs 5000. In addition, there are many landless families that depend on allied activities like making baskets for packaging betel leaves. The project-affected villagers opine that the POSCO-India plant is bound to take away not only their land but also livelihood. This is particularly so as there is an overwhelming skepticism regarding projected 48,000 direct and indirect jobs to be created. Further, lack of necessary knowledge and skills is also likely to prevent them from availing job opportunities.

Case 2: Land Acquisition for Tata Nano Project in Singur, West Bengal

The West Bengal government had signed a lease agreement with Tata Motors for its small car project at Singur. The choice of Singur was made by the company amongst the six sites offered by the state government. Singur is a census town in Hooghly district and the Tata Motors chose this site for its better access to Kolkata and the associated infrastructure facilities.

While the government had gone for acquisition of 997 acres of single and multi-crop land (affecting approximately 12,000 owners) required for the car factory, questions were raised about the allegedly forcible acquisition process under the Land Acquisition Act of 1894. Even many of the provisions of this Act were allegedly not been met[9]. The State Government had fixed cash compensation of Rs 8.7 lakhs per acre to the owners of single-cropped land and Rs. 12.8 lakhs per acre for double-cropped land. Further, registered share croppers were also offered with a cash compensation of 25% of compensation value given to the owners, i.e., between Rs. 2-3 lakhs per acre (Mohanty, 2007).

Of the 997 acres required, the Government claimed to have received consent from the owners of 952 acres, payments had been made for 635 acres of land to 9020 land title holders. Three-fourths of the 12,000 persons affected, including sharecroppers, had collected the compensation amount. It is claimed that the compensation of Rs. 9.5-11 lakhs per acre is almost three times higher than the prevailing market price[10]. A unique feature of the compensation package is that it is not restricted to the owners of the land, but is also extended to those who are directly engaged in farming activities like agriculture laborers, share croppers, etc. Besides this, training camps were also set up to train the affected people in various ways, such as catering, tailoring and technical skills.

But despite being offered with such lucrative compensation package, the project faced a strong

9. For details see www.wikipedia.org
10. For details see *The Hindu*, December 13, 2006.

resistance initially by the farmers and subsequently by the Krishi Jami Raksha Committee (KJRC) backed by a number of political parties. On many occasion police had to resort lathi charge, tear gases and fire many a times to clear the area from the protestors, injuring a large number of people (Mohanty, 2007). Various meetings took place between the government and local representatives, including the KJRC or their representatives to discuss modalities of land acquisition and compensation. But despite extensive consultations, the Government's own records suggest that no consensus emerged from these meetings on how to take the process forward (Ibid). The protests and violence initially delayed the commencement of commercial production and finally on 2nd October 2008, Ratan Tata officially announced pulling out of the project from Singur and setting up the same at Sanand, Gujarat.

An in-depth analysis of the Singur episode throws light on a number of interesting issues. First, the selected project site is believed to be the most fertile area in the Singur block and among the highly fertile areas in the state. Majority of the local people depend entirely on agriculture with approximately 1,50,000 people making their livelihood directly from it. Thus, villagers had the fear of losing not only their land but also livelihood for the small car project. This might have made many of the villagers interested not for monetary compensation but getting back their source of livelihood. Further, the number of direct jobs to be created was not more than 1,000 and many of these were expected to go to those having necessary knowledge and skills. Thus, the local people understandably felt threatened for their livelihood. Although many villagers were interested to work in factories but their resistance against land acquisition might be due to the uncertainty on the number of jobs to be created indirectly and to be available to the villagers, as a large chunk of these jobs might go to the outsiders.

Second, the intervention by the Government of West Bengal in the process of land acquisition for a private corporate project became a major issue. There was also allegation that land was acquired forcibly from the farmers (Bhaduri, 2007; Mohanty, 2007; Basu, 2007; Fernandes, 2007). Besides, the lack of transparency in the process created enough doubt in the minds of the people and prevented them from being integrated with the project.

Third, apart from the acquisition of farmland, there was a great deal of concern over environmental degradation that was feared to be caused by the project damaging the surrounding land. A car factory requires huge amount of water and this was planned to be drawn from the nearby rivers along with ground water available in the area resulting in further depletion of ground water level. This posed threat on provision of safe drinking water for the local people. Further, drawing water from the wetland was expected to cause ecological imbalance as well.

Emerging Issues:

Thus in both the cases, the issues broadly centre on displacement of the villagers, loss of their livelihood and destruction of ecology and environment. It is evident that deciding the cash compensation and identifying the beneficiaries of the same have so far been the priority of the Government and the firms and the issues of rehabilitation and resettlement are largely ignored. Only cash compensation does not seem be enough to reasonably compensate for all the benefits that the land actually provides the farmers. Cash compensation needs to be accompanied by professional advisory services to the displaced on investing their compensation amount appropriately.

Further, people skilled in agriculture are generally not skilled for industries. Although efforts were made in making the people trained in various lines of activities, these were restricted only to the youths as development of skill is subjected to age and minimum level of basic education that most of the common farmers do not possess. Lack of necessary knowledge, skills and attitude on the part of the farmers also restrict them from running successful business venture with the compensation money as alternative source of livelihood. Under these circumstances, leasing out and not selling of the land to the companies may be a viable option for the farmers, as such arrangement can provide regular income in the form of lease rent to the farmers. The alternative way out might be giving the affected people shares in the project. These alternatives can largely take care of the problem of displacement, loss of livelihood and job insecurity of villagers together in the wake of industrialization. Such an arrangement can also make the affected people direct stakeholders of the company and hence can inculcate confidence and trust for the project in the mind of the affected people.

It is also important to note that the resettlement package offered by the business houses must ensure attainment of previous standard of living of the displaced people. Appropriate housing, sanitation and provision of safe drinking water facilities should be incorporated in the resettlement plan for the displaced. The firms are likely to have hazardous effects on the environment causing environmental pollution, degradation of soil fertility of the land, depletion of ground water level, deforestation, ecological imbalances, etc. To compensate for these negative environmental externalities, firms should adopt

Table 2: Status of CER practices by leading business houses of India.

Company	Pollution Prevention	Energy Efficiency	Alternative Sources of Energy	EMS and Compliance to Policies	Waste and Sewerage Management	Afforestation and Green Belts	Eco-friendly Technologies	Watershed Management	Conservation of Resources
Tata Group	?	?	?	?				?	
NTPC	?	?		?	?	?	?		
BHEL			?	?					?
Bajaj Auto Limited	?				?				?
Reliance Energy	?			?		?			?
Reliance India Limited		?		?	?	?			?
ONGC	?			?		?			
Hindustan Unilever Limited								?	?
Aditya Birla Group						?			?
ACC Limited	?			?	?	?			?
Larsen & Toubro Limited			?	?					?

Source: website of the respective company.

appropriate environmental management systems and also comply with ISO 14000 standards for adequate protection of the environment from the hazardous effects of their businesses. Plantation of trees and keeping the waterbeds and natural waterways clean from construction wastes primarily constitute the environmental responsibilities of the upcoming firms in the first phase.

Thus smooth entry of the new enterprises requires not only cash compensation but also a holistic approach by the company towards proper rehabilitation and resettlement of the affected people and control of environmental pollution and degradation. This requires a comprehensive set of CSR practices on the part of the companies. In India, CSR practices are left to the free will of the companies. The firms voluntarily adhere to CSR measures on the basis of their own judgments. The already existing firms in India have incorporated CSR practices into their corporate strategies to some extent, but the firms that are being newly established generally fail to recognize and perform their corporate responsibilities particularly in terms of displacement and environmental protection. Therefore, ensuring objective oriented and universally applicable responsibilities to the society on the part of the companies also require appropriate legal framework, policy resolutions and efficient enforcement agency. Although the issues of CSR for upcoming firms can be classified into few broad categories, the set may vary across cases. Thus, the policy implications and the regulatory mechanism should be made flexible to deal with the case specific CSR practices.

5. Conclusions

From the above discussion it is therefore clear that CSR practices are as important for the upcoming industrial units as for the existing ones particularly to overcome the disputes over acquisition of farmland. The CSR practices of firms being newly set up should primarily focus on the formulation and implementation of adequate rehabilitation, resettlement and compensation packages to gain the confidence and trust of the people for the project. Monetary compensation may be accompanied by rehabilitation through vocational training and education but a more appropriate approach might be leasing out the land or making the affected people shareholders of the company. This makes the company accountable for yielding a continuous flow of income to these people and thereby helps in removing insecurity of livelihood. Further, resettlement at par with previous standard of living of the people losing their home and social bonding should be considered with adequate importance. In addition, the issues of environmental protection and management should also be taken up sincerely by such firms as the setting up of new plants and industrial units is largely hazardous to the environment in terms of environmental pollution, including air, water and noise pollution, degradation of soil fertility of the land, deforestation, etc.

References :

Abratt. R., Sacks, D., 1988. The marketing challenge: towards being profitable and socially responsible. Journal of Business Ethics, 36(2).

Aupperle, K.E., Carroll, A.B., Hatfield, J.D., 1985. An empirical investigation between corporate social responsibility and profitability. Academy of Management Journal, 28:446-463.

Basu, P.K., 2007. Political Economy of Land Grab. Economic and Political Weekly, Vol. 42, No. 14.

Bert, S., 2008. A note on the interaction between corporate social responsibility and financial performance. Ecological Economics.

Bhaduri, A., 2007. Development or Developmental Terrorism? Economic and Political Weekly, Vol. 42, No. 07.

Bhaduri, A., 2007. Alternatives in Industrialisation. Economic and Political Weekly, Vol. 42, No. 18.

Bhattacharya, C.B., Sen, S., and Korschun, D., 2008. Using Corporate Social Responsibility to Win the War for Talent. MIT Sloan Management Review, 49(2):37-44.

Biggs, S., Messerschmidt, D., 2005. Social Responsibility in the Growing Handmade Paper Industry of Nepal. World Development Vol. 33, No. 11, 1821–1843.

Carrasco, I., 2007. Corporate social responsibility, values, and cooperation. International Atlantic Economic Society.

Cetindamar, D., Husoy, K., 2007. Corporate Social Responsibility Practices and Environmentally Responsible Behavior: The Case of The United Nations Global Compact. Journal of Business Ethics 76,163–176.

Cowton, C., 1987. "Corporate philanthropy in the United Kingdom". Journal of Business Ethics, 6:553-558.

DesJardin, J., 1998. Corporate Environmental Responsibility. Journal of Business Ethics 17: 825–838.

Dierkes, M., 1980. "Corporate social reporting and performance in Germany". Research in Corporate Social Performance and Policy, JAI Press, Greenwich, CT, 2:251-289.

Dummet, K., 2006. Drivers for Corporate Environmental Responsibility. Environment, Development and Sustainability 8, 375–389.

Durrand, A., 2006. CSR continues to define itself globally. Caribbean Business, 34(18).

Falck, O., Heblich, S., 2007. Corporate social responsibility: Doing well by doing good. Business Horizons, Volume 50, Issue 3, 247-254.

Fernandes, W., 2007. Singur and the Displacement Scenario. Economic and Political Weekly.

Government of India (2001), Census Report.

Graafland, J., Van de Ven, B., Stoffele, N., 2003. Strategies and Instruments for Organizing CSR by small and large Businesses in the Netherlands. Journal of Business Ethics, 47(1).

Griffin, J.J., Mahon, J.F., 1997. The corporate social performance and corporate financial performance debate. Business and Society, 36(1).

Jones, D., 1997. Good works, good business. USA today, April 25, 1B.

Kercher, K., 2007. Corporate Social Responsibility: Impact of Globalisation. Corporate Governance eJournal, Bond University.

Kytle, B., John G.R., 2005. "Corporate Social Responsibility as Risk Management: A Model for Multinationals". Social Responsibility Initiative Working Paper No.10. John F. Kennedy School of Government, Harvard University.

Longnecker, J.G., 1985. "Management priorities and management ethics". Journal of Business Ethics. 4:65-70.

Maignan, I., Ferrell, O.C., 2001. Antecedents and benefits of corporate citizenship: an investigation of French Businesses. Journal of Business research, 51(1).

Maignan, I., Ferrell, O.C., Huit, GTM., 1999. Corporate citizenship: cultural antecedents and business benefits. Journal of Academy of Marketing Science, 27(4).

Maignan, I., Ralston, D., 2002. "Corporate social responsibility in Europe and the US: insights from businesses' self presentations". Journal of International Business Studies, 33(3):497-514.

Maniknandan, R., Ravichandran, M., Williams, A.R.E., 2007. Corporate Environment Management: Pollution Control in Paper Industry. Productivity, Vol. 47, No.4.

Mohanty, M., 2007. Singur and the Political Economy of Structural Change. Indian Institute Of Management, Kolkata. WPS No. 601.

Moore, C., Richardson, J., 1988. "The politics and practices of corporate responsibility in Great Britain". Research in Corporate Social Performance and Policy, JAI Press, Greenwich, CT, 10:267-290.

O'Dwyer, B., 2003. "Conceptions of corporate social responsibility: the nature of managerial capture". Accounting, Auditing & Accountability Journal, 16(4):523-557.

Paluszek, J., 2005. "Ethics and Brand Value: Strategic Differentiation". April 6-7. (PowerPoint presentation).

Pinkston, T.S., 1991. "'Corporate citizenship': a comparative analysis of foreign affiliates located in the US and their domestic counterparts". University of Georgia, Atlanta, GA.

Pinkston, T.S., Carroll, A.B., 1996. "A retrospective examination of CSR orientations. Have they changed?". Journal of Business Ethics, 15(2):199-206.

Russo, M.V., Fouts, P.A., 1997. A resource-based perspective on corporate environmental performance and profitability. Academy of Management Journal, 40(3).

Sarkar, A., 2007. Development and Displacement. Economic and Political Weekly, Vol. 42, No. 16.

Sethi, P., Linda, S., 1998. "Ethical Behavior as a Strategic Choice by Large Corporations: The Interactive Effect of Marketplace Competition, Industry Structure and Firm Resources". Business Ethics Quarterly 1:96-98.

Simpson, G.W., Kohers, T., 2002. The Link Between Corporate Social and Financial Performance: Evidence from the Banking Industry. Journal of Business Ethics, 35:97–109.

Smith, C., 1996. Corporate citizens and their critics. New York Times, September 8, 11.

Taka, I., 2007. Corporate Social Responsibility: Current Context and Future Directions. Productivity, Vol. 47, No.4.

Vance, S., 1975. Are Socially Responsible Corporations good investment risks? Management review, 64(8).

Vyakarnam, S., 1992. Social responsibility: What leading companies do. Long Range Planning, Volume 25, Issue 5, 59-67.

Waddock, S.E., Graves, S.B., 1997. The corporate social performance-financial performance link. Strategic management journal, 18(4).

Zyglidopoulo, S.C., 2002. The Social and Environmental Responsibilities of Multinationals: Evidence from the Brent Spar Case. Journal of Business Ethics 36:141–151.

Determinants of Rural Non-Farm Employment

A State Level Analysis

Pinaki Das*

The factors that affect rural non-farm employment (RNFE) across the states are grouped into five broad categories, namely agricultural prosperity, infrastructure facility, other development indicators, policy-related factors and distress variables. Foodgrain productivity positively and significantly explains the variation in RNFE across the regions. Commercialization of agriculture is directly and significantly related with RNFE across the states of India. Gross cropped area per rural population negatively and significantly explain the variation of RNFE across the regions. Rural infrastructural facility in a region influences on the magnitude of RNFE. Education is an important factor of non-farm employment opportunities. Public expenditure in rural areas and related government policy variables hardly affect the RNFE across the states. Unemployment and non-cultivating rural households are important residual factors for the expansion of RNFE. Thus, not only growth-led but also distress factors significantly explain the variation in RNFE at the aggregate regional level.

I. Introduction

The non-farm sector develops in rural areas due to certain facilitating processes. These processes emanate from either agriculture or outside it. The agriculture-led growth model suggests that a sustained rise in farm output and incomes can act as a prime mover in initiating the development of non-farm activities in the rural areas (Vaidyanathan 1986, Popola 1987, Dev 1990 and Unni 1991). Other processes like development of infrastructure (Shukla 1992 and Naryanamoorthy 2002), education (Eapen 1995 and Naryanamoorthy 2002), urbanization (Unni 1991, Jayraj 1994 and Parthasarathy et al 1998), growth of income which emanate from non-agricultural activities lead to the growth of non-farm activity in a region. Both these processes lead to the shift of rural workers to productive jobs in the non-farm sector.

On the other hand, 'distress diversification' into unproductive or low paid non-farm jobs occurs when labour is not fully absorbed in the agricultural sector, and the non-farm sector acts as a sponge for the excess labour. Such a spill off of excess labour from the agricultural to the non-farm sector has been put forward as the residual sector hypothesis (Vaidyanathan 1986, Eapen 1995).

The socio-economic and cultural diversity is prominent among states of India, which may explain variation in level of rural non-farm employment (RNFE) across states of India. The percentage share of RNFE to total rural employment across the states varied between 52.4 and 10.2 in 1993-94, 54.3 and 12.9 in 1999-2000 and between 58.0 and 15.6 in 2004-05. In 1983, among 19 states, the top five states in terms of high share of RNFE were Tripura (50.5 per cent), Kerala (37.5 per cent), Sikkim (36.6 per cent), Tamil

* Lecturer in Economics, Panskura Banamali College, Panskura, Purba Medinipur, West Bengal.

Nadu (26.9 per cent) and West Bengal (25.7 per cent). In 1999-2000, these states also occupied top five ranks, only West Bengal and Tamil Nadu interchanged their respective ranks. The share of RNFE to total rural employment in 1999-2000 was highest in Tripura (54.3 per cent), followed by Kerala (51.7 per cent), Sikkim (39.2 per cent), West Bengal (36.4 per cent) and Tamil Nadu (32.1 per cent). The top five states in 2004-05 were Kerala, Tripura, Sikkim, West Bengal and Haryana. The share of RNFE was relatively low in Madhya Pradesh, Meghalaya, Karnataka, Maharashtra and Bihar. The share of RNFE increased over time in majority of states. It declined in Tripura, Sikkim, Haryana, Uttar Pradesh, Bihar and Meghalaya during 1983 to 1987-88, in Orissa, Andhra Pradesh, Rajasthan, Gujarat and Madhya Pradesh during 1987-88 to 1993-94, and in Sikkim, West Bengal, Manipur, Karnataka, Gujarat and Meghalaya during 1993-94 to 1999-2000 but it increased in all states during 1999-2000 and 2004-05. The increase was perceptibly high in Kerala Himachal Pradesh, Haryana, West Bengal, Manipur, Punjab and Rajasthan (Table 1, Appendix).

Thus there are substantial variations in level of RNFE across the states of India. The questions that emerge are: What hypotheses are there to explain the variation in RNFE across the states? Which hypothesis is most important to explain the phenomena? Which factors/groups of factors are dominant for the variation in RNFE? The present paper makes an attempt to address these questions with reference to the states of India.

2. Framework of Testable Hypotheses

At the cross sectional level at which we analyse data in the present study, it is difficult to clearly distinguish the dynamic process that leads to the growth of NFE. Therefore, we analyse the process that leads to the variation in RNFE across states. The factors that affect the variation of RNFE across the states of India are grouped into five broad categories, namely, i) Agricultural Prosperity, ii) Infrastructure Facility, iii) Other Development Indicators, iv) Policy-related Factors and v) Distress Variables. We have developed five models to analyze the significance of these groups of factors on the RNFE.

i) Agricultural Prosperity

Agricultural prosperity in a region is specified by three indicators: a) Food- grain Productivity or Yield rate (FGP), b) Gross Cropped Area per rural population (GCA), c) Percentage share of Non-Foodgrain Area to total cropped area (NFGA)

A high level of agricultural productivity (indicating high income of the farmer) would occur through multiple linkages of agriculture with the rural non-farm sector, including both consumption and production linkages (Mellor 1976). The consumption linkages operate through an increase in income of the rural farmers. This would result in an increase in demand for goods and services produced in near-by villages and towns. Agricultural wages are also expected to rise with increase in agricultural productivity so that the labourers would also have an increased demand for food and other non-food items. Production linkages, both backward and forward, would also emanate from the agricultural sector. Backward linkages from the agricultural to non-farm sector constitute the demand from farmers for inputs produced in the non-farm sector, such as ploughs, engines and other tools. Forward linkages reflect the need to process agricultural goods, so that agro-processing industries, e.g. rice-milling, tobacco processing etc. would develop.

Another factor facilitating non-farm employment may be the predominance of non-food crops in the cropping pattern of a region. This can have a direct impact on non-farm activity by supplying raw materials for processing and other industrial activities. Such a cropping pattern may also imply more commercialized agriculture in the region, which can have an indirect impact on non-farm activity through the inter-linkages between the output, credit and labour markets. The specification of cropping pattern implies commercialization of agriculture, i.e., the percentage share of non-foodgrain area to total area (NFGA).

Land is an important asset in rural area. Availability of cultivable land engages people in the agricultural activity and they are not attracted to the low paid and low-earned non-farm activity. Therefore, higher ratio of gross cropped area per rural person (GCA) indicates lower share of RNFE.

ii) Infrastructure Facility

Rural Infrastructure has a hypothesized regional influence upon the magnitude of RNFE that is presumed to operate through the production or supply side (Shukla 1992). Three indicators specify Infrastructure development in a region: a) Road Density (RDEN), b) Share of credit to non-farm activity (CRDT), c) Percentage of villages electrified (VELF).

Improvement of rural roads induces the rural workforce to shift from agriculture to non-farm work. High road density in a region implies better communication that facilitates the expansion of non-farm work.

Credit is a potentially powerful explanatory factor for non-farm work. Availability of credit to the non-farm activity induces rural labour force to engage in non-farm activity.

The village electrification is a productive infrastructure input for non-farm activity. Power is a very important ingredient for expansion of manufacturing and other the non-farm activities.

iii) Other Development Indicators

Other development indicators outside agriculture and infrastructure related to the expansion of RNFE are: a) Percentage of urban population to total population (UPOP), b) Literacy Rate (LTR), c) Per capita Domestic Product (PCDP).

The proximity to or existence of a large urban population in the region also facilitates the expansion of RNFE (Unni, 1991). This affects the rural labour market in two ways: through the non-farm supply side in providing location and product support to rural employment off the farm. Some of the residents of the rural areas may engage in non-farm occupations in the near-by urban areas and commute to their place of work regularly. Another avenue of the urban sector's influence over the non-farm sub-sectors acts through the demand for the product of non-farm activity depending upon the nature of the urban place hierarchy. The spatial integration of the markets, small towns or large city may provide either marketing opportunities or price/product competition for rural non-farm exports. To capture the impact of urbanization the variable is specified as the percentage of urban population to total population in a region (UPOP).

The level of education appears to facilitate and enable shift of the workforce from farm to non-farm (Eapen, 1995). Education not only improves an individual's qualifications for non-farm jobs, but also increases his ability to allocate his work time efficiently among income producing activities (HO, 1986).

Education becomes important for high quality and urban type employment opportunities. Thus the effect of education on the participation rate in non-farm activities among the rural young is probably also more significant.

The level of income in a region is hypothesized to have a direct impact on rural non-farm activity in rural areas through an increased demand for diversified non-farm goods. The proxy for the level of income in a region is the per capita state domestic product.

iv) Policy Related Factors

Government Policies and Public Expenditure are other prime movers outside agriculture that determine RNFE. Three proxies of government policies and public expenditure are specified as: a) percentage share of rural development expenditure to total expenditure (SRDX), b) per capita rural development expenditure (PRDX) and c) percentage share of plan expenditure on rural and social sector (SRSX).

v) Distress Factors

Two distress factors used to explain the distress diversification of rural workers from the farm sector to the non-farm sector are: a) rural unemployment rate (UNEP) and b) non-cultivating rural households (NCRH).

There is a strong positive relation between unemployment rate and the proportion of RNFE across the regions and this is attributed an imbalance between demand and supply of labour (Vaidyanathan, 1986).

The landless labour households in rural areas are in the most vulnerable position. A large concentration of such households in a region can also lead to inadequate agricultural wage employment for all. This could result in a spill over of workers into low productivity/low income non-farm activities. This variable has been specified as the percentage share of non-cultivating rural households.

3. Determinants of RNFE

This section analyses the determinants that explain significantly the variation of RNFE across states for two distinct points of times–1993-94 and 1999-2000 using data for 25 states. At each point of time the cross section analysis helps us identify the factors that significantly explain the variation of RNFE. The hypotheses highlighted in the previous section are analysed through regression. The results of multiple regression equations are presented in Table 1.

Agricultural Prosperity

It is observed that the regression model relating to agricultural prosperity (Equation 1, Table 1) is good fitted. The adjusted R^2 and F of the estimated equation are such that the relevant regression model is fitted to the data set at 1 per cent level and it also satisfies the assumptions of normality and homoscedasticity of disturbance term and there is no multicollinearity among the explanatory variables. The regression also confirms that the level of RNFE across the states is positively influenced by foodgrain productivity (FGP), proportion of non-foodgrain area (NFGA), and negatively influenced by gross cropped area per rural population (GCA). However, the regression parameter of FGP is statistically significant at 1 percent level in 1993-94 and at 5 per cent level in 1999-2000. Another indicator, i.e., NFGA

is highly significant (at 1 per cent level) for both the years. On the other hand, GCA negatively affects the share of RNFE and the regression parameter of this factor is statistically significant at 10 per cent level. The results confirm the hypothesised effect on RNFE. The result of the model is explained in the following ways.

A high level of foodgrain productivity in a region is facilitating the expansion of RNFE in that region through the consumption and production linkages. Commercialization of agriculture (NFGA) which is directly and significantly related with RNFE across the states can have direct impact on NFE by supplying raw materials for processing and other industrial activities. It has also an indirect impact on non-farm activity through the inter-linkages between the output, credit and labour markets. Commercial crops are produced necessarily for sales in the market and hence the trade and commerce activity increases to expand RNFE. Availability of cultivable land engages people in agricultural activity and they are not attracted to the low paid and low earned non-farm activity. Therefore, higher ratio of gross cropped area per rural population implies lower share of RNFE. Thus agricultural development encourages rural non-farm employment by supplying raw materials, creating demand for inputs, generating surplus for investment in non-farm activities and thus increases demand for rural non-farm products through increase in income.

Table 1 Determinants of RNFE across States of India, 1993-94 and 1999-2000

Eq. 1 Regression Equation concerning Agricultural Prosperity				
Year	Equation	R^2	Adj. R^2	F
1993-94	RNFE = 4.78 + 0.71 FGP*** + 0.48 NFGA*** – 23.3 GCA* (0.63) (2.74) (3.83) (-1.97)	0.50	0.43	7.01***
1999-2000	RNFE = 7.22 + 0.78 FGP** + 0.41 NFGA*** – 31.64 GCA* (0.77) (2.35) (2.95) (-1.74)	0.42	0.33	4.97***
Eq. 2 Regression Equation concerning Rural Infrastructure				
Year	Equation	R^2	Adj. R^2	F
1993-94	RNFE = -11.54 + 0.01 RDEN** + 0.41 CRDT** + 0.03 VELF (-0.82) (2.57) (2.52) (0.26)	0.46	0.39	6.00***
1999-2000	RNFE = -26.56 + 0.01 RDEN*** + 0.42 CRDT** + 0.17 VELF (-1.50) (2.57) (2.52) (1.25)	0.58	0.52	9.69***
Eq. 3 Regression Equation concerning Other Development Indicators				
Year	Equation	R^2	Adj. R^2	F
1993-94	RNFE = -1.32 – 0.28 UPOP + 0.52 LTR*** + 0.03 PCDP (63) (-1.19) (3.13) (1.21)	0.40	0.32	4.69***
1999-2000	RNFE = -13.22 – 0.39UPOP + 0.50 LTR*** + 0.02 PCDP*** (-1.20) (-1.58) (2.76) (2.81)	0.45	0.38	5.81***
Eq. 4 Regression Equation concerning Policy Related Factors				
Year	Equation	R^2	Adj. R^2	F
1993-94	RNFE = 8.61 – 0.58 SRDX – 0.001 PRDX + 0.60 SRSX* (0.62) (-0.56) (-0.52) (1.79)	0.18	0.07	1.60
1999-2000	RNFE = 5.34 – 0.83 SRDX** – 0.02 PRDX + 0.71 SRSX** (0.44) (-2.03) (-1.53) (2.36)	0.27	0.17	2.64*
Eq. 5 Regression Equation concerning Distress Factors				
Year	Equation	R^2	Adj. R^2	F
1993-94	RNFE = 14.43 + 2.71 UNEP*** + 0.20 NCRH* (3.50) (2.69) (1.73)	0.45	0.40	9.07***
1999-2000	RNFE = 9.97 + 2.48 UNEP*** + 0.24 NCRH* (2.23) (3.79) (1.98)	0.57	0.53	14.56***

Notes: 1. Figures in the parentheses indicate the t-values

2. * Significant at 10 percent level, ** 5 percent level and ***. 1 percent level

3. GCA =Gross Cropped Area per Rural Population (hect.), FGP = Foodgrain Productivity or Yield Rate (Q/hect.), NFGA = Percentage Share of Foodgrain Area to Grossed Cropped Area, RDEN = Road Density (Length of Road per Thousand Square K. M), CRDT = Percentage Share of Credit to Rural Non-Farm

Activities (%), VELF = Percentage of Villages Electrified(%), PCDP = Per capita State Domestic Product (Rs.), LTR = Percentage Share of Urban Population to Total Population (%), SRDX = Percentage Share of Rural Development Expenditure to Total Expenditure (%), PRDX = Per Capita Rural Development Expenditure (Rs.), SRSX = Share of Plan Expenditure on Rural and Social Sector (%), UNEP = Rural Unemployment Rate Percentage NCRH = Percentage Share of Non-Cultivating Rural Households (%), RNFE = Percentage Share of Rural Non-Farm Employment (%).

Infrastructure Facility

The regression equation concerning rural infrastructure (Equation 2, Table 1) indicates that the share of RNFE across the states is positively influenced by road density (RDEN) and the share of credit for rural non-farm activities (CRDT). However, the percentage of villages electrified (VELF) does not significantly explain the variation in RNFE. In the regression equation for the year 1993-94 both RDEN and CRDT are significant at 5 per cent level. The regression parameters of RDEN and CRDT are statistically significant at 1 per cent and 5 per cent level respectively for the year 1999-2000. The adjusted R^2 and F of the estimated equation are fitted for the data set and the equation also satisfies the assumptions of normality and homoscedasticity of the disturbance term and there is no multicollinearity among the regressors. The results of the regression equation indicate the hypothesised impact of RDEN and CRDT on RNFE. The result is explained in the following ways.

Agricultural prosperity is a necessary but not sufficient condition. There is the need for good rural infrastructure. RDEN positively and significantly affect the variation in RNFE. High road density (RDEN) in a region implies better communication, which is facilitating the expansion of non-farm activity. Credit (CRDT) is the potential powerful explanatory indicator for non-farm work. Availability of credit for the non-farm activity has a facilitating factor for rural people who try to engage in non-farm activity. The village electrification rate (VELF) is a productive infrastructure input for non-farm activity. But it hardly facilitates the traditional pattern of non-farm activity and hence its impact is positive but insignificant for RNFE. It is worth-noting that infrastructure is a facilitating factor for the expansion of RNFE. A developed road network and credit facility and availability of electricity enable rural non-farm activities to be located in rural areas without having to suffer from special disadvantages. The contrasting experiences of Taiwan-China and Korea amply demonstrate this. A more developed road network and grater availability to electricity in the former contribute a great deal to a decentralisation of non-farm activities. And since rural non-farm activities could develop all over the country side, employment opportunities are created for the rural people who are able to participate in rural non-farm activities without having to leave the countryside.

Other Development Indicators

In the regression equation concerning other development indicators (Equation 3, Table 1) for 1999-2000, literacy rate (LTR) and per capita state domestic product positively and significantly explain the variation in RNFE across the states. The regression parameters of PCDP and LTR are statistically significant at 1 per cent level. On the other hand, UPOP negatively affects the share of RNFE but the regression parameter of this factor is statistically insignificant.[1] In 1993-94 only LTR is significant and it positively explains the variation in RNFE across the states. The regression parameter of this indicator is significant at 1 per cent level. On the other hand, UPOP is negatively and PCDP is positively associated with the share of RNFE but the regression parameters of these variables are not statistically significant. Adj. R^2 and F statistics of the estimated regression equation are such that the relevant model is fitted for the data

set at 1 per cent level and it also satisfies the assumptions of normality and homoscedasticity of the disturbance term. It is noted that the degree of multicollinearity is very low and does not create any trouble for the estimation of the regression parameters. The result of the regression equation indicates the hypothesised impact on the variation in RNFE. The implication of the result is as follows.

LTR is an important promotional factor for rural non-farm activities. Increase in the educational level stimulates the skill and technical knowledge and expectation; the educated are attracted to superior jobs outside the farm sector.

Urbanisation is another development indicator outside agriculture but it is not statistically significant. It has been felt in our study that the true significance of the impact of urbanisation cannot be ascertained due to data limitations. This is because over time some rural areas, due to change in economic structure, get classified as urban areas (Basant and Kumar, 1989).

PCDP is a demand side factor of 'other development indicator' which significantly affects RNFE. The result of the regression (for the year 1999-2000) satisfies the hypothesized direct impact on rural non-farm activities in rural areas through an increasing demand for diversified non-food goods.

Policy Related Factors

In 1999-2000, among the three policy related factors, namely share of rural development expenditure (SRDX), per capita rural development expenditure (PRDX) and the share of plan expenditure on rural and social sector (SRSX), SRDX negatively and SRSX positively affect the share of RNFE and this relation is statistically significant (Equation 4, Table 1). The regression parameters of these two indicators are statistically significant at 5 per cent level. On the other hand, the regression parameter of PRDX is statistically insignificant. Adj. R^2 and F of the estimated regression model are such that the relevant regression model is fitted to the data at 5 per cent level. But for 1993-94, only SRSX is statistically significant at 5 per cent level, the estimated regression parameters of other two independent variables are not significant and the model is not fitted either. The above results indicate that the public (government) expenditure in rural areas and related government policy hardly affect the variation in RNFE across the states.

Distress Diversification

The distress diversification hypothesis is examined by an estimated regression model (Equation 5, Table 1) where rural unemployment rate (UNEP), and the share of non-cultivating rural households (NCRH) are used as the distress factors. The regression equation with distress factors indicates that UNEP is statistically significant at 1 per cent level and NCRH at 10 per cent level for both the year 1993-94 and 1999-2000. UNEP and NCRH have positive influence on the variation in RNFE across states. Adjusted R^2 and F statistics are such that the regression model is good fit for the entire data set. The model also satisfies the assumption of normality and heteroscedasticity of the disturbance term. Even multicollinearity is insignificant. The result is explained as follows.

Unemployment and non-cultivating rural households are most important residual factors for the expansion of RNFE. The persons who are not absorbed fully in agriculture spill over into rural non-farm activities. Increase in non-farm employment is on account of decline in employment elasticises in the agriculture sector in the face of rising population pressure on land and thus the spill over effect on the rural non-farm sector leading to rise in employment in the latter. This is basically related to limitations of the agricultural sector in coping with rural poverty and hence the importance of the rural non-farm as an alternative residual employment.

From the above analysis it is clear that the factors relating to agricultural prosperity, rural infrastructure and distress diversification are much more important for the determination of RNFE.

4. Relative Importance of Different Groups of Variables

The correlation coefficient between the share of RNFE and different groups of independent variables helps us assess the significance of different groups of factors.[2] The correlation matrix of RNFE and standardized grouped independent variables for the years 1993-94 and 1999-2000 across the states of India is presented in Table 2 and Table 3 respectively.

From the first column of the correlation matrix (Table 2) for the year 1993-94, it is seen that distress-induced factors (DISF) has the highest correlation with the share of RNFE (0.67), followed by agricultural prosperity (AGLP) (0.64), rural infrastructure (RINF) (0.59) and other development indicators (ODVI) (0.43). The correlation coefficient of AGLP, RINF and DISF with RNFE is significant at 1 per cent level. 'Other development indicators' (ODVI) is significant at 5 per cent level and policy related factor (POLF) is not significant.

Table 2 Correlation Matrix of RNFE and Standardized Grouped Independent Variables in States of India, 1993-94

	RNFE	AGLP	RINF	ODVI	DISF	POLF
RNFE	1.00					
AGLP	.64**	1.00				
RINF	.59**	.48*	1.00			
ODVI	.43*	.48*	.64**	1.00		
DISF	.67**	.65**	.70**	.52**	1.00	
POLF	.31	.18	.08	-.29	.20	1.00

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

For 1999-2000, it is also seen that DISF has the highest correlation with the share of RNFE (0.74), followed by RINF (0.72), AGLP (0.63), which are all significant at 1 per cent level. The correlation coefficient of ODVI (0.48) and POLF (.49) with RNFE are relatively low (Table 3).

Table 3 Correlation Matrix of RNFE and Standardized Grouped Independent Variables in States of India, 1999-2000

	RNFE	AGLP	RINF	ODVI	DISF	POLF
RNFE	1.00					
AGLP	.63**	1.00				
RINF	.72**	.51**	1.00			
ODVI	.48*	.43*	.62**	1.00		
DISF	.74**	.52**	.55**	.51**	1.00	
POLF	.49*	.19	.29	.10	.24	1.00

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Thus distress-induced factors (DISF) appear to be most important to explain the variation in the share of RNFE across states of India. RINF and AGLP are also more important to do the same across the states of India.

5. Summary and Conclusions

Among the three indicators of rural infrastructure RDEN and CRDT are positively and significantly explain the variation in RNFE. Percentage of villages electrified has positive effect on RNFE but the relationship is not statistically significant. High road density (RDEN) in a region implies better communication, which facilitates the expansion of non-farm activity. Availability of credit to the non-farm activity is a facilitating factor for rural people who try to engage in non-farm activity. The regression parameters of LTR and PCDP in the determination of RNFE are positive and statistically significant. On the other, UPOP negatively affects the share of RNFE but the regression parameter of this factor is statistically insignificant. Literate persons try to engage in non-farm activity in preference to farm activity. PCDP, the index of the level of income in a state, has also positive effect on RNFE.

The regression equation concerning distress factors indicates that UNEP and NCRH positively and statistically affect the RNFE across the states of India. This is basically related to limitations of the agricultural sector in coping with rural poverty and hence the importance of the rural non-farm as an alternative residual employment.

From the above analysis it is clear that the distress factors and factors relating to agricultural prosperity, rural infrastructure are much more important for the determination of RNFE.

From the above discussion the following policy recommendations may be made.

First, in order to make expansion of RNFE productive and really meaningful for livelihood and better living of the workers emphasis should be made on promotion of socio-economic development of the regions. Agriculture and manufacturing should be developed, particularly in the relatively backward regions. Commercialisation of agriculture should be emphasized so that it caters to the dynamic needs of the overseas and internal markets in the era of liberalisation and globalisation of the Indian economy, and thus the farmers' purchasing power is increased to help them get food security.

Second, infrastructural facilities like credit, road, electrification and irrigation should be extended impressively to the rural areas so that these have positive influence on development of agriculture, manufacturing, trade-commerce and services. Decentralised planning should be strengthened in rural areas for this purpose.

Third, level of education including technical education should be promoted so that they have positive impact on growth of RNFE.

Appendix

Table 1 Percentage Share of RNFE to Total Rural Employment in States of India, 1983 to 1999-2000

States	1983	1987-88	1993-94	1999-2000	2004-05
Tripura	50.5(1)	43.9	52.4	54.3(1)	56.8 (2)
Kerala	37.5(2)	40.1	43.6	51.7(2)	58.0 (1)
Sikkim	36.6(3)	18.5	41.4	39.2(3)	39.5 (3)
Tamil Nadu	26.9(4)	28.9	29.5	32.1(5)	34.6 (6)
West Bengal	25.7(5)	28.5	36.7	36.4(4)	37.3 (4)
Orissa	22.2(6)	23.6	19.1	21.8(12)	31.0 (8)
Andhra Pradesh	20.9(7)	21.9	20.7	21.2(13)	28.2 (11)
Haryana	19.3(8)	18.3	28.1	31.5(6)	35.9 (5)
Manipur	19.2(9)	25.5	36.2	24.7(9)	30.7 (9)
Punjab	17.0(10)	19.8	25.3	27.4(7)	33.1 (7)
Uttar Pradesh	16.7(11)	14.9	20.0	23.8(10)	24.4 (14)
Bihar	15.8(12)	14.9	15.7	19.4(15)	26.1 (13)
Maharashtra	15.2(13)	16.4	17.4	17.4(17)	20.0 (16)
Rajasthan	14.9(14)	25.8	20.1	22.3(11)	27.1 (12)
Karnataka	14.7(15)	17.5	18.8	17.9(16)	19.0 (17)
Gujarat	13.9(16)	27.8	21.3	20.2(14)	22.7 (15)
Himachal Pradesh	13.7(17)	17.5	19.7	26.4(8)	30.4 (10)
Meghalaya	12.5(18)	11.1	14.0	13.5(18)	18.2 (18)
Madhya Pradesh	9.4(19)	11.8	10.2	12.9(19)	15.6 (19)
Mean	*21.2*	*22.4*	*25.8*	*27.1*	*31.0*
CV	*49*	*39*	*44*	*43*	*37*

Notes: Figure in parentheses indicates the rank.

Sources: NSSO, Employment and Unemployment Situation in India, *NSS* 38th Round, 1983, *NSS* 43rd Round. 1987-88, *NSS* 50th Round, 1993-94, *NSS* 55th Round, 1999-2000, *NSS* 61st Round, 2004-05.

References :

1. Dev, Mahendra (1990), 'Non-Agricultural Employment in India: Evidence at a Dis-aggregate Level', *Economic and Political Weekly*, Vol.25, No. 28, pp.1526-36.
2. Eapen, Mridul (1995), 'Rural Non-Agricultural Employment in Kerala, Inter-District Variations'. *Economic and Political Weekly*, Vol.30, No.12, pp.634-38.
3. Eapen, Mridul (2001), *Rural Industrialisation in Kerela: Its Dynamics and Local Linkages*, Manohor.

4. Harris, John (1991), 'Agriculture/Non-Agriculture linkages and the Diversification of Rural Economic Activity: A South Indian Case Study' in Jan Bremen and Sudipta Mundle (eds.).

5. Ho, Samuel P. S. (1986), 'The Asian Experience in RNA Development and its relevance for China', *World Bank Staff Working Paper*, Vol-1 & Vol-2.

6. Jayaraj, D. (1994), 'Determinants of Rural Non-Agricultural Employment', in Pravin Visaria and Rakesh Basant (eds.), pp.153-85.

7. Mellor, John (1976), *The New Economics of Growth: A Strategy for India and the Developing World*, Cornel University Press

8. Parthasarathy, G., Shameem and B. Sambi Reddy (1998), 'Determinants of Rural Non-Farm Employment: The Indian Case', *Indian Journal of Agricultural Economics*, Vol.52, No.2, pp.139-54.

9. Shukla, Vibhooti (1992), 'An Empirical Model of Rural Non-Farm Activity', *Indian Economic Journal*, Vol.39, No.4, pp.7-29.

10. Naryanamoorthy, A., Queenie Rodrigues and Ashwini Phadnis (2002), 'Determinants of Rural Non-Farm Employment: An Analysis of 256 Districts', *Indian Journal of Labour Economics*, Vol.45, No.4, PP. 759-70.

11. Papola, T.S (1987), 'Rural Industrialization and Agricultural Growth: A Case Study on India' in Rizwanul Islam (ed).

12. Unni, Jeemol (1991), 'Inter-Regional Variations in Non-Agricultural Employment in Rural India: An Explanatory Analysis', *Economic and Political Weekly*, Vol.26, No.3, pp.109-22.

13. Unni, Jeemol (1996), 'Non-Agricultural Employment and Rural Livelihoods: Macro vis-à-vis Micro View', *The Indian Journal of Labour Economics*, Vol.36, No.4, pp. 795-808.

14. Vaidyanathan, A (1986), 'Labour Use in Rural India: A Study of Spatial and Temporal Variation', *Economic and Political Weekly*, Vol.21, No.52, pp.A130- A146.

15. Vaidyanathan, A. (1997), 'Report on the Workshop to Evolve an Agenda of Research on Rural Non-Agricultural Employment', *Indian Journal of Agricultural Economics*, Vol.52, No.1, pp. 151-57.

Pattern of Growth of Handloom Industry in Districts of West Bengal

Chittaranjan Das[1]

Handloom industry in West Bengal witnessed higher growth rate in respect of production than that in India as a whole. Compound annual growth rate of total looms in West Bengal, looms under cooperative, workers, number of total cooperative societies and number of active cooperative societies and sales under the organized handloom sector, however, registered deceleration in growth during the economic reforms era compared to that of the pre-reforms period. Number of looms under active cooperative societies, number of total cooperative societies and number of active cooperative societies recorded significant growth for most of the districts during the pre-reforms period, which decelerated and even registered negative growth for most of the districts during the reforms era.

1. Introduction

Since the day of advent of modern factory-based production and industrialization in Europe and the British colonial rule over India, the handloom industry of the country has passed through many tribulations. In post-Independence India when the Government adopted the path of modern industrialization through state-centred planning to accelerate the pace of economic development in the country, it laid equal importance on the development of labour-intensive traditional industry sector such as crafts and handloom. In order to solve the problem of open unemployment in a labour surplus economy, the Government had no other options. More so, the traditional household-based artistic handloom fabrics reflect the cultural heritage of the country and this sector is the major provider of employment to people in the informal economic sector next to agriculture. The history of handlooms dates back to epic periods. From those days it is the part of our rich cultural heritage. Bengal was the home of arts and crafts before the colonial period in India. Continued from the ancient period, the history is too well known to be refold in the Nawabi period of Bengal (Ghosh, 1907:62). The introduction of imported machine-made textile goods to India destroyed the home market of Indian handlooms (Mukhopadhyay, *1987:.9-14)*. In the first half of the twentieth century, the chief centres of cotton textile production in Eastern India were Dacca, Luckipore, Santipur, Malda, Baranagar, Haripal,Rangpur, Kashimbazar. Midnapore etc. It has been observed that the total number of weavers in 1891 was 1178130 and 1124870 in 1901 in Bengal(Gupta , *1908:. 9.*). The 'Swadeshi Movement' checked the steep decline in the number of weavers in the industry. In the Presidency Division, Shantipuri dhotis and sarees were of very much demand for its fine texture. Cheaper cotton wrappers of Kushtia and Kumarkhali satisfied the needs of the poor classes people. Cotton cloths were manufactured in the districts of Jessore, Khulna and Murshidabad. Cheaper coarse varieties cotton cloth, which was consumed by mainly peasants and labourers were woven in many villages in the district of Birbhum (Mally, 1910:76.). One kind of coarse cloth, known as 'Lepcha cloth' used to be manufactured in the district of Darjeeling. One variety of coarse cloth (photo) of jute

[1]Sr. Lecturer of Commerce, V.S.Mahavidyalaya, Manikpara, Paschim Medinipur (West Bengal) and Research scholar, Dept. of Economics with Rural Development, Vidyasagar University, Midnapore, West Bengal

and cotton mixed was produced and mainly consumed by Rajbansi women at home in the district of Dinajpur. In the neighborhood of Itahar, cloth of somewhat finer texture was made and exported to other districts for use as mosquito netting (Strong, 1912: 81.). The weaving industry appeared to have much headway in Noakhali, Comilla, Pubna and Faridpur districts which produced very large quantities of checks and chintzer suitable for marking coats, shirts and Panjabis(Bhattacharyya, 1986: 9.) Islam (1987) has observed a growing interest in rural industries (and non-farm activities in general) in recent times. The role of small-scale and rural industries has always been emphasized as an integral part of the industrialization programme in Asian countries including India. There are also studies relating to the survival and even expansion of traditional forms of production. Cook (1984), Bottomley (1965), Ho and Huddle (1976), Mies (1981), Ray (1991), Krishnaraj (1992) hold that labour-intensive traditional forms of production are not disappearing but persisting or even expanding as capitalist industrialization intensified. The most unique and notable feature of the handloom industry is in fact its glorious survival in the competition with large-scale mill sector (Government of West Bengal, 1979-80). Indian weavers are not only producing enough cloth to meet internal demand, but also exporting numerous artistic varieties to the highly industrialized countries of the world (Anjaneyula, 1990). Handloom products have a good demand outside India for their unique colour combinations and attractive designs. Industries of this type are necessary for the expansion of international trade and commerce, for securing favourable balance of payments and strengthening the socio- economic tie with other countries. It is to be noted that exports of handloom goods increased 135 times during 1970 – 71 to 1995 – 96 (Desai, 1988; Govt. of India, 1990; and *Compendium of Textile Statistics* 1996-97). The importance of the industry in our country can be gauged from the fact that it mets 24 % of total cloth requirements of the masses in 1980 – 1981 and it meets 20 % in 1999 – 2000. Apparently it seems it decreased by 4% but actual production went up from 3109 to 7352 million square meters, i.e., increase in total production by about 236 %. (By the way, during the same period, mill production dropped from 4533 to 1714 million square meters) (Uzrama 523). It is also noted that this industry provides largest number of employment next to agriculture. Estimates of number of people employed in the Indian handloom sector employees varied from 6.5 million to 12.5 million people (*Census of Handloom* 1987 – 88, 1995 – 96). It is observed that handicrafts often create employment opportunities for disadvantaged social groups (Kathuria 1980) and one of the strategies proposed for the solution of mass poverty in the third world countries is the expansion of small-scale industries, domestic industries and the handicrafts sector in the rural areas (Mies 1981). The handloom sector now plays a very important role in the country's economy. The importance of handloom sector in the national economy cannot be overemphasized on account of having the advantage of flexibility of small production run, uniqueness, innovation and adaptability to the exports requirement. Export of handloom has been identified as "Thrust area" for the overall development of the sector.

The National Council of Applied Economic Research (1958) made a survey on handloom industry in four districts of Karnataka. The study mostly has been confined to the organization, production and marketing activities of the household units. In 1959 the National Council of Applied Economic Research, New Delhi, conducted an investigation namely, "Survey of the Handloom Industry in Karnataka and Sholapur". It was jointly sponsored by the All India Handloom Board and the Ministry of Commerce and Industry. It elucidated the organizational structure and the size of cooperative and non co-operative handloom sectors. It pointed out the need for giving encouragement to the handloom industry in those

areas. Krishnamurty (1970) pointed out that decentralized handloom weaving was beset with the crucial problem of funding adequate finance. Rao (1971) made a study and stressed only upon the co-operative form of organization for the development of handloom industry. Mukund, Syama Sundari (1998) discussed in their paper the handloom weavers' cooperatives in Andhra Pradesh. Parthasarathy (1998) discussed in his study the nature of drift of different types of weavers (viz. independent or dependent weavers), problems etc. in handloom sector. Khasnobish & Nag (2001) observe that the features of labour process in a transitional economy have some similarities to handloom industry in West Bengal with what has been outlined by Marx and Breverman in their studies on labour process in the context of West Europe and North American society. At the same time, there exist some other features, which are new and different. The deskilling tendency in the labour process associated with the tied or bondage relation between the direct producer and *mahajan*[2], a separation between conception and execution in multi-loom though technology remains simple and at the same time a unity of conception and execution in the labour process in some cases are features that describe the labour process in a traditional situation with respect to region in third world country. Raj, (2001) discussed in his study about problems and prospect of handloom industry and give emphasis on cooperativisation. Singh (2002) argues that co-operatives could have a bright future in India if they are transformed into member-owned autonomous organization governed by the representatives of their members, managed professionally and liberated from unnecessary legal and government control. Soundarapandan (2002) argues co-operation, though considered as the best form of organization for decentralized industry like handloom, was not successful. Inspite of the continuous efforts over the last four decades the co-operatives could attract only 30% of the total weavers of the country. Inadequate or improper financial support to the co-operatives is considered one of the main reasons for their failure. The financial assistance to the handloom industry is being provided at present through NABARD, District Co-operative Banks, State Co-operative Banks, Central Co-operative Banks, etc. Singh (2002) observes that industrial co-operatives have performed well in some places and badly in many other places. In the new era characterized by deregulation, de-licensing, liberalization, privatization and globalization they are facing several challenges, and serious doubts have been expressed as to their ability to cope with those challenges and to survive in the new era. The major challenges include improving financial viability, proffessionalization of management liberation from the archaic cooperative law and excessive government control, attracting, nurturing, and retaining good leadership and enhancing and retaining member loyalty. Narasaiah (2004) pointed in his study that the fruits of the industry have been actually grabbed by the usurious money lenders and extortionate middle-men and weavers are not conscious about their profession. However, they are continuing in the profession, not because they like it but because they have no other way out. Syamasundari (2006) made a case study at Mangalagiri in Guntur districts of Andhra Pradesh. This study highlights that in Mangalagiri, master weavers dominate and handlooms cooperatives are more or less non-existent in terms of master weavers approach to flexibility, product differentiation, new markets, etc. Annapurna (2006) expresses his views in his paper that ' Despite many anticipation of its decline, the resilience of the handloom market in India demonstrates an inherent quality of the products as well as many intangible associations it carries for its customers. The brief review of the existing literature shows that there is hardly any study on handloom industry in West Bengal focusing on pattern of growth of the industry across districts including the cooperative sector. Against this brief backdrop of the importance of the handloom industry and the deficiency in the existing literature on West Bengal the present note makes an attempt to examine the pattern of growth

of handloom industry in West Bengal vis-à-vis that of the whole of India and that across districts of the state.

Objectives of the Study

The present study sets the following objectives for itself:

1. To examine the pattern of growth of production of handloom clothes and trend of employment in West Bengal vis-à-vis the whole of India, both before and during the economic reforms period.
2. To examine the progress of handloom industry in districts of West Bengal, both before and during the economic reforms period and that of the cooperative sector.

Hypotheses:

The following are the hypotheses that are tested in the study.

1. The growth of the handloom production in West Bengal is higher than that in India as a whole.
2. The growth of the handloom industry in West Bengal and the whole of India with respect to production and employment is statistically significant during the pre-reforms period while that decelerates during the reforms period.
3. The number as well as the looms of handloom weavers' cooperative society witnessed significant growth during the pre-reforms period, which declined during the reforms era.

Data Base and Methodology

In this study we used only secondary data. The secondary data relate to production, employment, number of looms, number of cooperative societies, number of active cooperative societies and sales under organized sector etc and the major sources of these data are Handloom Census, Compendium of Textiles Statistics, Government of India, Annual Reports of Ministry of Textiles, Govt. of India, Economic review, Government of West Bengal and some raw data collected from Directorate of Handlooms, Government of West Bengal. Simple Statistical tools like percentage, index number, regression etc, have been used to analyse the data. To examine the growth rates we have estimated simple annual growth rates and compound annual growth rate (CAGR). Computer has been used to process the data.

2. Growth of Handloom Industry in West Bengal vis -a -vis the Whole of India

During the period from 1987-88 to 2005-06 production of handloom cloths increased from 4370 million sq meters to 6108 million sq meters in India and from 390 million sq meters to 1080 million sq meters in West Bengal. Simple annual growth rate of handloom cloth production during this period is estimated at 2.21% and 9.83% in case of India and West Bengal respectively. In 1987-88 West Bengal produced about 9 percent handloom cloths to total handloom cloths produced in India and this share increased to 18 percent in 2005-06. The growth of production of handloom cloth in West Bengal is positive and faster than that of India. Number of persons employed in the handloom sector of India increased from 65.33 lakhs in 1987-88 to 120 lakhs in 2005-06 while in West Bengal the number of persons employed in the handloom sector (full time / part time) did not change during this period (1987-88 to 2005-06). In 1987-88 the percentage share of persons engaged in this sector was about 10 percent in West Bengal to the

total persons employed in handloom sector in India and this percentage decreased to 5.56 percent in 2005-06. Simple growth rate of employment in India in this industry was 83.68 per cent whereas in West Bengal the number of persons employed in handloom industry of West Bengal did not change (Table 1).

Table: 1 Production of Handloom Cloths and Employment in Handloom Sector, 1980-81 to 2005-06

Year	India		West Bengal	
	Production (Million sq. Mtrs)	Workers (lakh)	Production (in Million sq. Mtrs)	Workers (lakh)
1987-88	4370 (100)	65.33 (100)	390 (8.92)	6.67(10.21)
1995-96	7202 (100)	65.51 (100)	401 (5.57)	6.48 (9.89)
1997-98	7603 (100)	124 (100)	439 (5.77)	6.67 (5.38)
1998-99	6792 (100)	124 (100)	440 (6.48)	6.67 (5.38)
1999-2000	7352 (100)	124 (100)	440 (5.98)	6.67 (5.38)
2000- 01	7506 (100)	124 (100)	679 (9.05)	6.67 (5.38)
2001-02	7585 (100)	124 (100)	650 (8.57)	6.67 (5.38)
2002-03	5980 (100)	120 (100)	1204 (20.13)	6.67 (5.56)
2003-04	5493 (100)	120 (100)	1192 (21.70)	6.67 (5.56)
2004-05	5722 (100)	120 (100)	1081 (18.89)	6.67 (5.56)
2005-06	6108 (100)	120 (100)	1080 (17.68)	6.67(5.56)

Source: Compendium of Textile Statistics, 2005; Various Annual Reports Ministry of Textiles, Government of India & Economic Review, Government of West Bengal.

Note: Figures within parenthesis represent percentage share.

CAGRs of total production of handloom clothes in India and in West Bengal during the pre-reform period from 1980-81 to 1990-91 are estimated at 3.56% and 3.87% respectively. In both the cases in India and also in West Bengal production of handloom clothes grew significantly at 1 percent level of significance. During the reform period from 1991-92 to 2005-06 CAGRs of the same in India and West Bengal works out at1.07% and 8.28% respectively. Production of handloom clothes in West Bengal increased significantly at 1 percent level of significance, but production of handloom clothes in India increased insignificantly (as (T – ratio is 1.02). We observe that in the whole period i.e., from 1980-81 to 2005-06 CAGRs in India and West Bengal work out at 3.44% and 4.64% respectively. During this whole period in cases, i.e., in India and also in West Bengal total production of handloom clothes increased significantly at 1 percent level of significance. Therefore, we observe a positive growth of handloom industry in India and also in West Bengal during the last two decades and a half (Table 1a and 1b).

Table: 1a Year-wise Production of Handloom cloths in India and West Bengal, 1980-81 to 1990-91
Production (Million sq. Mtr).

Year	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	CAGR(%)
India	3109	3046	3234	3429	3639	4135	4305	4370	3993	3924	4295	3.56*
West Bengal	285	305	307	365	370	372	383	390	399	414	432	3.87*

Source: Same as Table 1

Table: 1b Year-wise Production of Handloom cloths in India and West Bengal, 1991-92 to 2005-06
Production (Million sq. Mtr)

Year	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	CAGR(%) (1991-92 to 2005-06)	Over all CAGR (%) (1980-81 to 2005-06)
India	4123	5219	5851	6180	7202	7456	7603	6792	7352	7506	7585	5980	5493	5722	6108	1.07	3.44
West Bengal	445	447	443	400	401	439	394	440	440	679	650	1204	1192	1081	1080	8.28*	4 64

Source: Same as Table 1

CAGR of total number of looms, number of looms under cooperative fold, production of handloom clothes, number of persons employed in handloom sector, number of handloom weavers' cooperative societies and sales under organized sector in West Bengal during the pre-reform period from 1976-77 to 1990-91 are estimated at 3.61%, 5.09%, 5.03%, 1.81%, 2.08% and 17.60% respectively. Except number of persons employed in handloom sector, all the other variables increased significantly at 1 percent level of significance and employment grew significantly at 5 percent level of significance. During the reform period from 1991-92 to 2006-07 CAGRs of the above mentioned variables worked out at -.005%, 1.14%, 7.93%, -.204%, 1.30% and -2.18% respectively. That means, number of looms decreased significantly and number of looms under cooperative fold and production of handloom clothes and number of handloom weavers' cooperative societies grew significantly at 1 percent level of significance, but employment and sales under organized sector decreased insignificantly. We observe that in the whole period, i.e., from 1976-77 to 2006-07, CAGRs of the above mentioned variables worked out at 1.94%, 3.16%, 4.73%, .249%, 2.37% and 5.28% respectively. During this period except employment all the variables increased significantly at 1 percent level of significance. We observe a positive growth of handloom industry in West Bengal (Table 2). Percentage share of looms under cooperative fold to total looms in West Bengal increased from 39 percent to 54 percent during 1976-77 to 2006-07. Growth of total number of looms and number of looms under cooperative fold in West Bengal are shown graphically in Figure 1.

Figure: 1. Graphical Presentation of Comparative increase of Total Number of Looms and Number of Looms under Cooperative fold in West Bengal shown in the figure above.

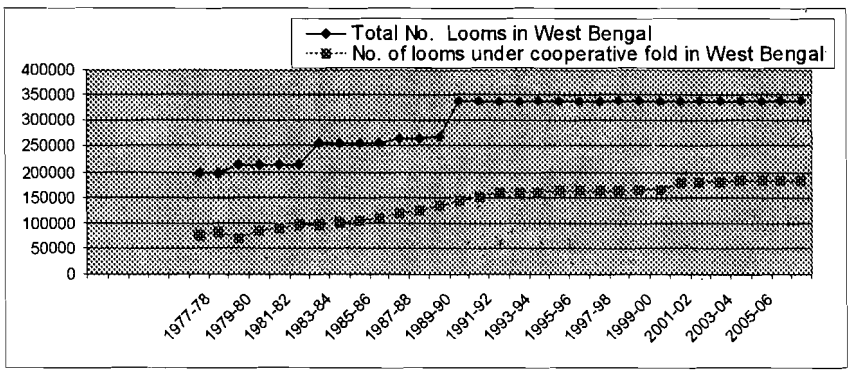


Table: 2 Progress of Handloom industry in West Bengal, 1976-77 to 2006-07

Year	Total No. looms	Index	No. looms under cooperative fold	Index	Production (million mtrs.)	Index	Employment ('000 number)	Index	Handloom weavers' cooperative societies (number)	Index	Sales turnover in organized sector (Rs. in crores) at current price	Index
1	2	3	4	5	6	7	8	9	10	11	12	13
1976-77	198585	100	76674 (38.61)	100	207	100	510	100	1333	100	3.07	100
1977-78	198585	100	80945 (40.76)	106	225	109	516	101	1459	109	5.79	189
1978-79	211990	107	71157 (33.57)	93	250	121	551	108	1222	92	9.32	304
1979-80	211990	107	84480 (39.85)	110	270	130	636	125	1261	95	14.3	467
1980-81	211990	107	91822 (43.31)	120	285	138	663	130	1280	96	20.9	680
1981-82	211990	107	96250 (45.40)	126	305	147	663	130	1290	97	25.7	836
1982-83	256556	129	97704 (38.08)	127	307	148	852	167	1185	89	28.5	928
1983-84	256556	129	101760(39.66)	133	365	176	852	167	1239	93	25.4	829
1984-85	256556	129	105653 (41.18)	138	370	179	642	126	1296	97	28.5	928
1985-86	256556	129	111783 (43.57)	146	372	180	642	126	1365	102	35.1	1144
1986-87	266556	134	119010 (44.65)	155	383	185	667	131	1429	107	41	1336
1987-88	266556	134	125711 (50.19)	164	390	188	667	131	1510	113	41.5	1352
1988-89	269056	135	135041 (50.19)	176	399	193	667	131	1623	122	45	1466
1989-90	338499	170	144179 (42.59)	188	414	200	711	139	1722	129	50	1629
1990-91	338499	170	153188 (45.26)	200	432	209	711	139	1814	136	65.9	2145
CAGR(%)	3.61*		5.09*		5.03*		1.81**		2.08*		17.60*	
1991-92	338499	100	160524 (47.42)	100	445	100	700	100	1892	100	44	100
1992-93	338499	100	161342 (47.66)	101	447	100	690	99	1900	100	33.6	76
1993-94	338499	100	161393 (47.68)	101	443	100	680	97	1901	100	38	86
1994-95	338499	100	162396(47.98)	101	400	90	670	96	1914	101	65.6	149
1995-96	338499	100	163249 (48.23)	102	401	90	648	93	1922	102	70	159
1996-97	338499	100	163962 (48.44)	102	439	99	632	90	1929	102	64.3	146
1997-98	338499	100	164716 (48.66)	103	439	99	667	95	2171	115	60.9	138
1998-99	338499	100	165265(48.82)	103	440	99	667	95	2190	116	58.1	132
1999-00	338499	100	166545 (49.20)	104	440	99	667	95	2190	116	65	148
2000-01	338499	100	178678 (52.79)	111	679	153	667	95	2203	116	50.7	115
2001-02	338499	100	180812 (53.42)	113	650	146	667	95	2203	116	48.9	111
2002-03	338499	100	182118 (53.80)	113	1204	271	667	95	2203	116	52.3	119
2003-04	338499	100	183913 (54.33)	115	1192	268	667	95	2209	117	59.1	134
2004-05	338191	100	184173 (54.46)	115	1081	243	666	95	2210	117	29.1	66
2005-06	338169	100	184263(54.49)	115	1080	243	657	94	2212	117	32.4	74
2006-07	338169	100	182837 (54.07)	114	980	220	657	94	2199	116	28.3	64
CAGR(%)	-.005*		1.14 *		7.93*		-.204		1.30*		-2.18	
Overall CAGR(%)	1.94*		3.16*		4.73*		.249		2.37*		5.28*	

Source: Same as Table 1 and Directorate of Handloom, Govt. of West Bengal

Note: * indicates the CAGR is significant at 1% ** indicates the CAGR is significant at 5%, Figures within parenthesis represent percentage share.

3. Growth of Handloom Industry in Districts of West Bengal

Growth of handloom industry in districts of West Bengal is analysed under two heads :

a) Employment in handloom industry, and

b) Growth in number of handloom weavers' cooperative socities.

a) Employment in Handloom Industry

Employment generation by handloom industry in West Bengal across districts is shown in Table 3. This table exhibits that the handloom industry generates highest employment in Nadia (270775) followed by Murshidabad (62520), Burdwan (61800), Purba Medinipur (39866), Hooghly (38365) and Bankura (36183). So in these districts a large number of persons depend on handloom industry to maintain their livelihood. The table also reveals that the simple annual growth rate during the period from 1985-86 to 2005-06 was highest in Dinajpur (10.24) followed by Nadia (5.27) Darjeeling, etc. The growth rate was negative in the districts of Burdwan, Cooch Bihar, Hooghly, Malda, Murshidabad and even in undivided Midnapore district.

Table: 3 Number of Workers Engaged in Handloom Weaving in Districts of West Bengal, 1985-86 to 2005-06

District	1985-86	2004-05	2005-06	Simple Annual Growth Rate (%), 1985-86 to 2005-06
Bankura	29352 (4.58)	36183 (5.43)	36183 (5.50)	1.16
Burdwan	69775 (10.89)	62550 (9.39)	61800 (9.40)	-0.57
Birbhum	18695 (2.92)	24093 (3.62)	24093 (3.67)	1.44
Cooch Bihar	14012 (2.19)	4693 (0.70)	4693 (0.71)	-3.33
Darjeeling	200 (0.03)	404 (0.06)	404 (0.06)	5.10
Dinajpur	10528 (1.64)	32089 (4.82)	32089 (4.88)	10.24
Jalpaiguri	3235 (0.50)	4520 (0.68)	4520 (0.69)	1.99
Hooghly	58250 (9.09)	38365 (5.76)	38365 (5.84)	-1.71
Howrah	10300 (1.61)	10173 (1.53)	10173 (1.55)	-0.06
Malda	31358 (4.89)	17800 (2.67)	17800 (2.71)	-2.16
Midnapore	119760 (18.69)	47914-E (7.19) 25300-W (3.80)	39866-E (6.06) 25300W (3.85)	-2.28
Murshidabad	86590 (13.51)	62520 (9.39)	62520 (9.51)	-1.39
Nadia	131783 (20.56)	270775 (40.65)	270775 (41.19)	5.27
24 Parganas	44085 (6.88)	22471N (3.37) 1155S (0.17)	22471 N (3.42) 1155 S (0.18)	-2.32
Purulia	12998 (2.03)	5133 (0.77)	5133 (0.78)	-3.03
West Bengal	640921 (100)	666138 (100)	657340 (100)	0.13

Source: Directorate of Handloom, Govt. of West Bengal

Note: Figures within parenthesis represent percentage share.

b) Growth of Handloom Weavers' Cooperative Society

Well-performing Weavers Cooperative Society is a blessing to the weavers for development, welfare, reasonable remuneration, and safeguard for survival in the tough competitive textile market. So increasing number of weavers' cooperative society is a sign of progress of handloom industry. During the pre-reform period from 1980-81 to 1993-94 CAGRs of four districts (Darjeeling, Jalpaiguri, West Dinajpur , and Murshidabad) are estimated at 7% or above, and CAGRs of Howrah, Burdwan, Nadia and Cooch Bihar varied between 5% and 6.99% and CAGRs of 24 Parganas and Hooghly are estimated below 1%. Thus number of handloom weavers' cooperative societies increased significantly in all the districts at 1 percent level of significance (Table 4). CAGRs for districts in respect of number of handloom weavers' cooperative societies during the reform period from 1997-98 to 2005-06 are shown in Table 4a. We observe that for only four districts (Howrah, Hooghly, West Dinajpur and Jalpaiguri) estimated CAGRs lie between 1% and 2%. For rest of the districts CAGRs are estimated below 1% and six districts out of fifteen have CAGRs remaining unchanged during this period. So during the reforms period number of handloom weavers cooperative societies increased significantly for four districts at 1% level of significance except for the district of West Dinajpur (at 5% level of significance). In the districts of Nadia, Purulia, Malda and Cooch Bihar number of handloom weavers' cooperative societies increased significantly and slowly (CAGR below 1%) at 1% level of significance.

Table: 4 Growth in Number of Handloom Weavers' Cooperative Societies in Districts of West Bengal, 1981-82 to 1993-94

District	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	CAGR (%)
Howrah	20	23	20	26	26	26	26	27	31	34	36	37	37	37	5.04*
24 Parganas	220	225	175	155	159	162	166	174	187	193	199	207	209	210	.723
Hooghly	106	108	96	73	77	82	84	89	95	99	103	104	104	104	.93
Burdwan	98	102	90	116	128	142	152	159	163	167	171	171	171	171	5.1*
Bankura	95	80	91	103	105	107	107	108	112	115	118	119	119	119	2.48*
Purulia	30	33	35	36	36	37	37	38	39	40	41	42	42	42	2.26*
Nadia	201	205	198	212	224	223	225	279	306	335	356	372	376	376	5.99*
Midnapore	254	261	250	260	269	276	283	295	313	327	348	378	379	379	3.62*
Murshidabad	77	80	79	75	84	99	110	123	136	150	160	168	168	168	7.55*
Birbhum	65	68	63	71	74	75	80	83	90	97	102	108	108	108	4.62*
Malda	57	59	42	53	53	53	55	58	64	70	72	74	75	75	3.39*
West Dinajpur	17	20	20	25	26	28	31	33	37	39	45	46	46	46	8.05*
Cooch Bihar	25	20	19	24	25	25	30	31	36	37	40	40	40	40	5.95*
Jalpaiguri	10	5	7	10	10	10	12	12	13	17	19	20	20	20	9.15*
Darjeeling	5	1	-	-	-	1	1	1	1	2	4	6	6	6	9.53
West Bengal	1280	1290	1185	1239	1296	1346	1399	1510	1623	1722	1814	1892	1900	1901	4.03*

Table: 4a Growth in Number of Handloom Weavers' Cooperative Societies in Districts of West Bengal, 1997-98 to 2005-06

District	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	CAGR (%)
Howrah	25	25	25	27	27	27	28	28	28	1.7*
24 Parganas	234N 58S	234N 58S	234N 58S	234N 58S	234N 58S	234N 58S	234N 58S	234N 58S	234N 58S	#
Hooghly	104	104	104	105	105	105	105	105	105	1.44
Burdwan	184	184	184	184	184	184	184	184	184	#
Bankura	132	132	132	132	132	132	132	132	132	#
Purulia	64	64	64	66	66	66	67	67	67	.68*
Nadia	432	432	432	434	434	434	434	434	434	.069*
Midnapore	301E 117W	301E 117W	301E 117W	301E 117W	301E 117W	301E 117W	301E 117W	301E 117W	301E 117W	#
Murshidabad	194	194	194	194	194	194	194	194	194	#
Birbhum	108	108	108	110	110	110	110	110	104	-.09
Malda	80	80	80	80	80	80	81	81	81	.18*
West Dinajpur	54	54	54	55	55	55	56	56	63	1.33**
Cooch Bihar	55	55	55	57	57	57	58	58	58	.79*
Jalpaiguri	39	39	39	40	40	40	41	43	43	1.31*
Darjeeling	9	9	9	9	9	9	9	9	9	#
West Bengal	2171	2190	2190	2203	2203	2203	2209	2211	2212	.20*

Source: Same as Table 3

# indicates no change during the period.* indicates significant at 1% level.* * indicates significant at 5% level

Note: Midnapore District was bifurcated into Purba Medinipur and Paschim Medinipur on and from 1st January 2002. The figures shown in the Midnapore district comprise those of undivided Midnapore.

Table: 4b Distribution of Districts of West Bengal by CAGR(%) of Number of Handloom Weavers Cooperative Societies, 1980-81 to 1993-94 and 1997-98 to 2005-06.

CAGR(%)	1980-81 to 1993-94		1997-98 to 2005-06	
	No. of District	Name of District	No. of District	Name of District
Negative	0	------	1	Birbhum
0 - .99	2	24 Parganas, Hooghly	4	Purulia. Nadia, Malda, Cooch Bihar
1- 2.99	2	Bankura, Purulia	4	Howrah, Hooghly, West Dinaj Pur,Jalpaiguri
3-4.99	3	Midnapore, Birbhum, Malda	0	--
5 - 6.99	4	Howrah, Burdwan, Nadia, Cooch Bihar	0	--
7 and above	4	Murshidabad, West Dinajpur, Jalpaiguri, Darjeeling	0	---
No change	0	----	6	24 Parganas, Burdwan, Bankura, Undivided Midnapore, Murshidabad, Darjeeling

Source: Same as table 4and table 4a

CAGR of number of handloom weavers' cooperative societies across districts of West Bengal during 1980-81 to 1993-94 and that during 1997-98 to 2005-06 are shown by bar diagram in Figure 2 and Figure 3 respectively.

Figure:2. Graphical Presentation of CAGR (%) of Number of Handloom Weavers Cooperative Society across District in West Bengal, 1980-81 to1993-94. (as per Table 4)

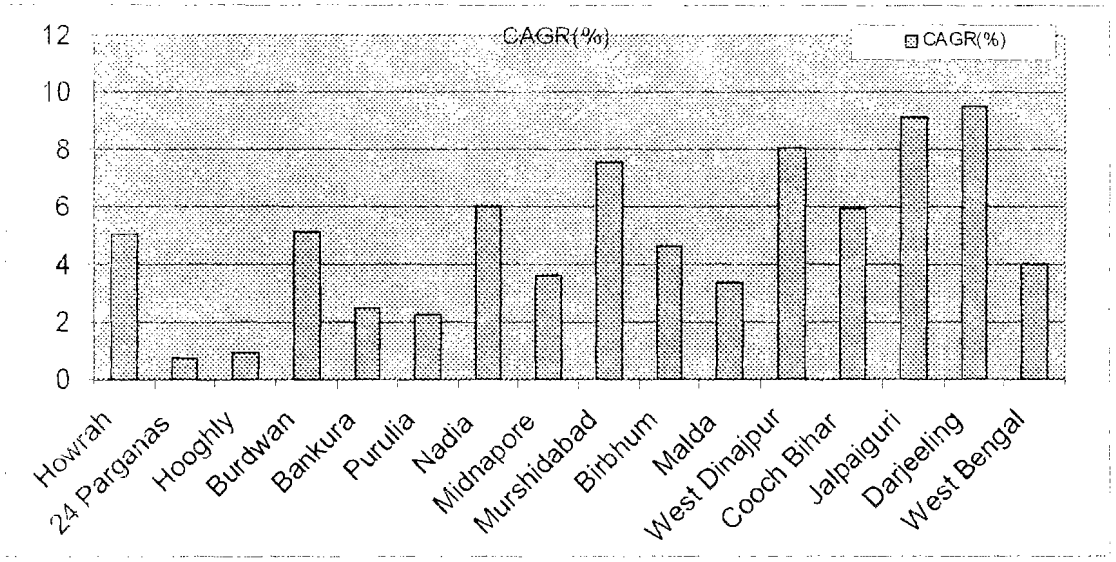
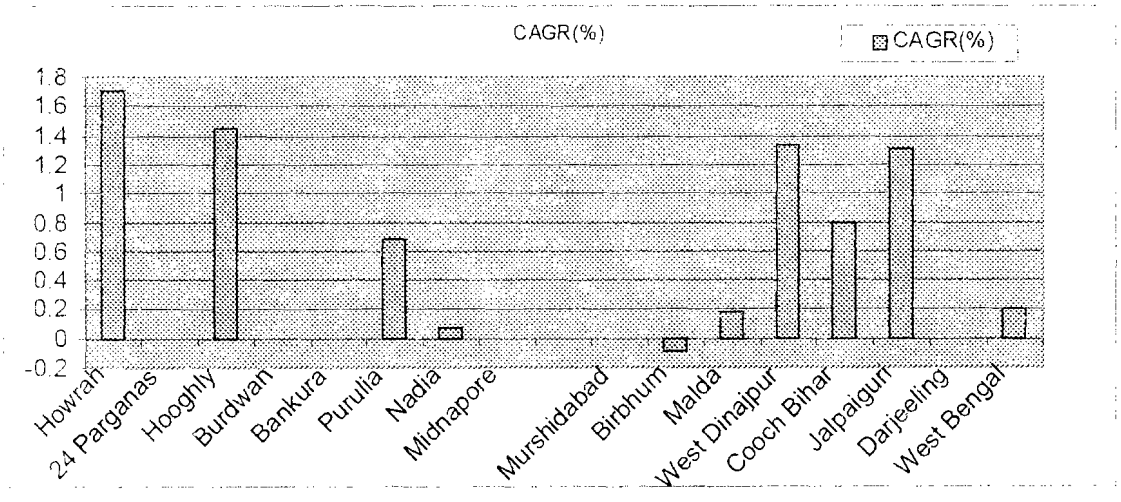


Figure: 3. Graphical Presentation of CAGR (%) of Number of Handloom Weavers Cooperative Society across District in West Bengal, 1997-98 to 2005-06. (As per Table 4a)



During the pre-reform period from 1983-84 to 1993-94 CAGRs of nine districts (Nadia, Midnapur, Murshidabad.Birbhum, Malda, Dinajpur, Cooch Bihar, Jalpaiguri, and Darjeeling) are estimated at 7% or above, and CAGRs of Howrah and Burdwan vary between 5% and 6.99% and CAGRs of 24 Parganas,

Hooghly, Bankura and Purulia are estimated at 3% to 4.99%. That means, number of active handloom weavers' cooperative societies increased significantly in all the districts at 1 percent level of significance (Table 5). CAGRs for the districts in respect of number of active handloom weavers' cooperative societies during the reform period from 1997-98 to 2005-06 are shown in Table 5a. We observe that CAGRs of all districts turned out to be negative during this period. So during the reforms period number of active handloom weavers' cooperative societies registers negative growth rate.

Table: 5 Growth of Number of Active Handloom Weavers' Cooperative Societies in Districts of West Bengal, 1983-84 to 1993-94

District	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	CAGR (%)
Howrah	20	20	20	20	22	24	27	29	30	30	30	5.28*
24 Parganas	145	150	153	158	168	178	184	190	198	200	201	3.6*
Hooghly	62	66	71	73	78	83	87	93	94	94	94	4.48*
Burdwan	101	114	113	147	154	157	161	168	168	168	168	5.08*
Bankura	33	35	37	37	38	41	44	49	50	50	50	4.65*
Purulia	20	20	21	21	22	23	24	26	27	27	27	3.61*
Nadia	160	174	183	205	228	251	280	307	323	327	327	8.01*
Midnapore	72	81	88	96	108	124	138	162	192	193	193	10.9*
Murshidabad	72	81	97	108	121	132	146	159	167	167	167	8.81*
Birbhum	36	39	40	45	48	53	60	67	73	73	73	8.06*
Malda	32	32	32	34	38	43	49	56	58	59	59	7.76*
Dinajpur	13	14	16	19	21	24	26	32	33	33	33	10.5*
Cooch Bihar	16	17	19	24	25	28	29	32	32	32	32	7.53*
Jalpaiguri	3	3	3	5	5	6	7	9	10	10	10	14.5*
Darjeeling	-	-	-	-	1	1	2	3	4	4	4	27.2*
West Bengal	785	846	914	993	1077	1168	1264	1382	1459	1467	1468	6.87*

Source: Same as Table 3

Table: 5a Growth of Number of Active Handloom Weavers' Cooperative Societies in Districts of West Bengal, 2001-02 to 2005-05

District	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	CAGR(%)
Howrah	13	13	12	12	9	9	-8.41
24th Parganas	57	57	56	55	54	52	-1.83
Hooghly	54	54	53	52	43	40	-6.29
Burdwan	86	85	82	78	72	68	-4.92
Bankura	46	45	45	44	30	26	-11.7
Purulia	14	14	13	13	13	11	-4.08
Nadia	135	133	127	123	103	103	-6.15
Midnapore	123	122	120	119	112	112	-2.1
Murshidabad	96	95	94	92	82	82	-3.57
Birbhum	52	51	49	48	46	42	-3.99
Malda	3	3	2	2	2	2	-9.27
Dinajpur	28	27	27	26	24	21	-5.23
Cooch Bihar	16	16	15	15	12	11	-7.82
Jalpaiguri	14	14	12	11	9	11	-7.48
Darjeeling	2	2	2	2	2	2	
West Bengal	739	731	709	692	613	592	-4.75

Source: Same as Table 3

Frequency distribution of districts of West Bengal by CAGR of number of active handloom weavers' cooperative societies during 1983-84 to 1993-84 and during 2001-02 to 2005-06 are shown in table 5b.

Table: 5b Distribution of Districts of West Bengal by CAGR(%) of Number of Active Handloom Weavers Cooperative Society

CAGR (%)	1983-84 to 1993-94		2001-02 to 2005-05	
	No. of districts	Name of Districts	No. of districts	Districts
Negative	0	---	15	All Districts
3-4.99	4	24 Parganas, Hooghly, Bankura, Purulia,	0	--
5 - 6.99	2	Howrah, Burdwan	0	--
7 and above	9	Nadia, Midnapur, Murshidabad,Birbhum, Malda, Dinajpur, Cooch Bihar, Jalpaiguri,Darjeeling	0	--

Source: compiled from table 5 and table 5a

Simple annual growth rate (SAGR) of looms under active handloom weavers' cooperative societies across districts in West Bengal is shown in Table 6. We observe that during the period from 1982-83 to 1988-89, Cooch Bihar district showed highest annual growth rate (19.37%) followed by Murshidabad

(14.10%), Dinajpur (13.41%), undivided Midnapur (12.74%) and Nadia (12.31%) and Burdwan (10.61%), and Bankura showed negative annual growth rate. During the period from 2004-05 to 2005-06 simple annual growth rate across districts of West Bengal is shown in the same table. Only four districts' annual growth rates were positive varying between 0.74% and 8.35%, and eight districts' SARGs were negative, varying between -34.69% and –3.67%.

Table: 6 Number of Looms under Active Handloom Weavers Cooperative Society in Districts of West Bengal, 1982-83 to 1988-89 and 2004-05 to 2005-06

District	'82-83	'83-84	'84-85	'85-86	'86-87	87-88	88-89	SAGR (%)	2004-05	2005-06	SAGR (%)
Howrah	1442	1498	1498	1510	1675	1779	2030	6.80	2085	2259	8.35
24 Parganas	13582	13727	14035	14377	14959	15945	16877	4.04	3802N 557S	3849N 557S	1.08
Hooghly	7994	8172	8448	8923	9440	9940	10542	5.31	7142	6880	-3.67
Burdwan	10772	11614	12303	15902	16915	17376	17632	10.61	14610	13682	-6.35
Bankura	6382	6382	6537	5202	5203	5266	5582	-2.09	5592	5280	-5.58
Purulia		2203	2225	2275	2435	2516	2568	2.76	1683	1550	-7.90
Nadia	13265	14615	15476	16566	18638	20677	23060	12.31	14694	14694	0.00
Midnapore	8640	9472	10061	11416	12329	13453	15244	12.74	11468E 3755W	11580E 3755W	0.74
Murshidabad	5235	5582	6140	7334	7916	8630	9663	14.10	9083	9083	0.00
Birbhum	3127	3240	3416	3531	3725	3934	4300	6.25	5035	4635	-7.94
Malda	5171	5171	5171	5065	5275	5531	5971	2.58	527	527	0.00
Dinajpur	1018	1119	1219	1221	1397	1511	1837	13.41	1935	1863	-3.72
Cooch Bihar	1550	1736	1817	2205	2806	2856	3351	19.37	2079	1986	-4.47
Jalpaiguri	154	154	154	154	260	367	260	11.47	912	937	2.74
Darjeeling	-	-	-	27	27	27	27	#	49	32	-34.69
West Bengal	78332	84685	88500	95708	103000	109808	118944	8.64	85008	83149	-2.19

Source: Same as Table 3

4. Conclusions

Handloom industry in West Bengal witnessed higher growth rate in respect of production than that in India as a whole. Compound annual growth rate of total looms in West Bengal, looms under cooperative, workers, number of total cooperative societies and number of active cooperative societies and sales under the organized handloom sector, however, registered deceleration in growth during the economic reforms era compared to that of the pre-reforms period. Number of looms under active cooperative societies, number of total cooperative societies and number of active cooperative societies recorded significant growth for most of the districts during the pre-reforms period, which decelerated and even registered negative growth for most of the districts during the reforms era.

Significant growth of handloom production in West Bengal along with decline in employment indicates that handloom sector is failing to attract workers and this sector thrives as a residual sector for employment. The handloom industry to flourish has to generate remunerative employment and this can be done only by increasing labour productivity, which can be done by diversification of the industry

as well as introduction of modern technology in the industry. The government ought to play pro-active role in the modernization of the handloom industry so that it can cater to the changing tastes and preferences of consumers, both domestic and overseas.

References :

1. Anjaneyula (1990), *Financial Management in the Cooperative Handloom Industry,* Classical Publishing company. P.7.
2. Annapurna, M. (2006), "Transiting Markets- Transcending Consumption", *Economic and Political Weakly,* August 5, pp.3388-3393
3. *Annual Reports*, Ministry of Textiles, Government of India.(Various issues).
4. Bhattacharyya, Amit, (1986) *Swadeshi Enterprise in Bengal,* 1900-1920, Calcutta, p.9.
5. Bottomely, A. (1965), "The fate of the artisans in Developing Economics", *Social and Economic Studies*, Vol.14, No. 2. Pp.194-203.
6. Cook. S. (1984), "Peasant Economy, Rural Industry and Capitalist Development in Oaxaca Valley", *The Journal of Peasant Studies*, Vol.12, 1,October pp.3-40.
7. *Compendium of Textile Statistics*, 2005, Government of India.
8. *Economic Review,* Government of West Bengal (Different issues).
9. Ghosh, D. R.(1907), *Indian Industrial Guide, 1907,* Calcutta, p.62.
10. Gupta, G.N.(1908), "A Survey of the Industries and Rresources of Eastern Bengal and Assam for 1907-08", *Shiplong,* p. 9.
11. Islam. R. (1987), *Rural Industrialisation And Employment in Asia*, ILO-ARTEP, New Delhi.
12. Krishnamurathy, O.S. (1970), *A Profile of Indian Industry*, Vora & Co Publishers Pvt. Ltd. Bombay.
13. Krishnaraj. M. (1992), 'Women Crafts workers as Security for family Subsistance', *Economic and Political Weekly,*Vol. XXVII, No. 17. April 25, pp.WS,7- 17.
14. Mukund, K. and Syama Sundari, B. (1998), 'Doomed to Fail? Handloom Weavers' Cooperatives in Andhra Pradesh', *Economic and Political Weekly* 38 (52): 3323–3335.
15. National Council of Applied Economic Research (1958), *A Survey of Handloom Industry in Four Districts of Karnataka and Solapur*, Delhi.
16. Narasaiah, L. (2004), *Economics of Handloom Industry,* New Delhi, Sonali, Vii. p. 97
17. O.Mally Less, *Bengal District Gazetteers, Birbhum*, Calcutta 1910, p.76.
18. Strong, F.W. (1912), *Eastern Bengal District Gazetteers, Dinajpur*, Allahabad, p. 81.
19. Syamasundari, B., Niranjana, S. (2006), "Mangalagir—Case Study of Master Weavers", *Economic and Political Weekly*, August 5, pp.3377-3379.

Participatory Development at the District Level A Study of Two Selected Districts in West Bengal

Basubandhu Sengupta[1]

Participatory development as a process of decentralized planning and development is means as well as end of development in itself. It is being widely used in the discourse of rural development. But level as well as nature of participation in this process is not encouraging. Our present study examines nature and level of participatory rural development at the district level through the functioning of Zilla Sansad.

1. Introduction

Participatory development is a buzzword today in the development literature and discourse. In West Bengal, the Panchayat Bodies like gram Panchayat at the village level, Panchayat Samiti at the block level and Zilla Parishad at the district level are institutions by which the concept of people's participatory development is being practiced. For making the Panchayats people's institutions the West Bengal Panchayat Act 1973 and its subsequent amendments contain many provisions.

The application of participation is rooted in the logic "that people should have an opportunity for controlling their own fate as much as possible" (Dore and Mars 1981:30). From the First Five Year Plan it has been emphasized that the participatory development is very useful and needful for making human development a reality. Participatory development not only means enlistment of the support of the masses, but also expects the active involvement of people in different stages of formulation and implementation of plan and programmes.

The enactment of the 73rd Constitution Amendment Act and the subsequent state-wise Panchayat Raj Acts in India have brought to the fore the significance of grass root democratic processes of decentralized planning and participatory rural development. Decentralized planning is an approach to bring the planning process closer to the people so that they can decide their development priorities and participate in planning and implementation. Participatory rural development can be defined as the process in which the development initiative is taken by the rural people for which it is intended (Mukhopadhyay and Sau 2002.1).

According to Section 163 of West Bengal Panchayat (Amendment) Act 2003 every Zilla Parishad shall have a Zilla Sansad consisting of the following members: (a) Pradhans of all GPs , (b) Sabhapaties , Sahakari Sabhapaties, and all Karmadhyakshas of all PSs comprising the zilla parishad,and (c) all members of that zilla parishad . This section of the Act suggests that (i) a zilla parishad shall hold an annual and half-yearly meeting of such sansad at such time and place and in such manner as may be prescribed, (ii) one-tenth of the total number of members shall form a quorum for a meeting of a zlla sansad. As per provision if no quorum is available for such meeting, the meeting shall be adjourned to be held at the

[1] Research scholar, Dept. of Economics with Rural Development, Vidyasagar University, Midnapore, West Bengal

same time and place on the seventh day from the date of such meeting in the manner as may be prescribed. The West Bengal Panchayat (Amendment) Act suggestes that the zilla sansad shall guide and advise the zilla parishad for all matters relating to development including preparation of annual plan and budget, schemes or projects and undertaking such activities for economic development and for ensuring social justice as are undertaken or proposed to be undertaken by zilla parishad.

Against this backdrop the present note examines the nature and level of participatory rural development at the district level with reference to two districts of West Bengal, namely Paschim Medinipur and Bankura.

Data Base and Methodology

This study is based on both primary and secondary data. Primary data have been collected from the offices of Bankura and Paschim Medinipur Zilla Parishads while the secondary data from *Census of India* and *District Statistical Handbooks* of Bankura and Paschim Medinipur districts. Simple statistical tools have been used to analyze the data.

Plan of the Paper

The rest of the paper is organized as follows. Section 2 presents demographic and panchayat profiles of the two districts. Section 3 discusses the level of participation of members in the Zilla Sansad meetings and section 4 the pattern of participation. Section 5 analyses the level and nature of participation in terms of schemes adopted for implementation and the receipts and expendituresof panchayats on those schemes. Section 6 makes concluding observations.

2. Brief Profile of the Study Area

Undivided Midnapore district started experimenting with 'village-based district plan' since the very beginning of the decentralized planning era. Paschim Medinipur , a newly born district, forms part of Bardhaman Division and is located in the south west corner of the State The district has a total area of 9295.28 sq km. of which 170.38 sq km. is forest area which constitute about 18.61% of its total geographical area. The district is predominantly agricultural with more than 70% of the population being dependent on agriculture and allied activities. Animal husbandry and fishery are the other major sources of livelihood in rural areas. According to Census 2001, the district has a total population of 51, 93,411 of which 45, 75,651 persons reside in rural areas. As much as 49.07% of this rural population is women, followed by SCs and STs constituting 18.8% and 14.45% respectively. Rural literacy rate of the district comes to 57.07% and literacy rates of women; SCs and STs are 47.16% 47.00% and 38.76% respectively. Distribution of rural workforce in terms of main, marginal, and non-worker, comes to 28.33%, 14.09%and 57.57% respectively. The district has 29 Panchayat Samitis over 29 CD Blocks and 290 gam panchayats.

Bankura district of Bardhaman Division is located in the south west of the State. The district has a total area of 6882.0 sq km. The district is also predominantly agricultural with more than 76.7 % of the population being dependent on agriculture and allied activities. Animal husbandry and fishery are the other major sources of livelihood in rural areas. According to Census 2001, the district has a total population of 3192695, of which 92.63% persons reside in rural areas. As much as 48.76 % of population is women, followed by SCs and STs constituting 997408 (31.24%) and 330783(10.36%) respectively. There

are 22 Panchayat Samitis, 190 Gram Panchayats and 2464 Gram Sansads in this district.

Table 1 Demographic Data of Pascim Medinipur District and Bankura vis-à-vis the Whole of West Bengal, 2001 (In Lakhs)

	West Bengal	Paschim Medinipur	Bankura
Area (Sq. KM.)	88752	9786	6882
Population	801.76	51.93	31.93
Male	414.66	26.48	16.36
Female	387.10	25.45	15.57
Rural	577.49	45.76	29.57
SC & ST(Rural)	228.60	17.09	13.28
Literacy Rate(Rural)	63.42	68.7	62.04
Total Workers(Rural)	218.90	19.41	13.48
Total Non-Workers(Rural)		26.34	16.10
Main Workers	161.07	12.96	8.74
Cultivators(Rural)	55.86	6.33	4.39
Agricultural Laborers(Rural)	72.41	7.38	5.01
Marginal Workers(Rural)	57.83	6.45	4.74
House Hold Industry Workers (Rural)	17.18	1.59	.75
Other workers(Rural)	73.45	4.11	3.33

Sources: *Census of India* 2001 West Bengal, *District Statical Hand Books* of Bankura and Paschim Medinipur 2004.

Table 2 Number of Gram Panchayats, Blocks and Gram Sansads in Pascim Medinipur District and Bankura vis-à-vis the Whole of West Bengal , 2001

	West Bengal	Paschim Medinipur	Bankura
Total No. of Gram Sansads	45154	3491	2464
Blocks	341	29	22
GPs	3354	290	190

Sources: *Census of India* 2001 West Bengal, *District Statistical Hand Books* of Bankura and Paschim Medinipur 2004.

3. Level of Participation in Zilla Sansads

Among the members of Bankura zilla sansad the highest participation is in 1st sabsad meeting, i.e., 61.52 percent of members and the lowest is in 5th sansad meeting during 2004 February to 2007 August. It shows

that attendance of GP pradhans and PS members (Sabhapaties and Sahasabhapaties and Karmadhaysksya) are not encouraging. Among 242 PS members the highest attendance is 52.89 percent and the lowest is 26.45 percent and among GP members the highest attendance is 44.74 percent and the lowest is 13.68 percent Among the Z P members the highest is 70.73 percent and the lowest attendance is 29.27 percent (Table 3).

The highest attendance of Paschim Medinipur zilla sansad is 52.46 percent of members in 1st meeting among the total zolla sansad members of 671. The lowest attendance is 44.71 percent in 3rd zilla sansad meeting. This table shows that the lowest attendance of ZP members is 16.13 percent among total ZP members of 62. The highest attendance is 61.29 percent in 2nd zilla sansad meeting. It is observed that during the period from 1st to 6the zilla sansad meeting the highest participation of PS members is 51.97 percent and lowest is 35.17 percent. Among the GP members the highest attendance is 48.97 percent and the lowest is 42.41 percent (Table 4)

Table 5 shows that 52.46 percent members attended the 1st meeting of Pashim Medinipur zilla sansad where as 61.52 percent members of total zilla sansad members are present in the 1st meeting of Bankura zilla sansad. The percentage of average attendance of PaschimMidnapur zilla sansad members is 47.09 whereas in Bankura that is 42.49 percent. Table 6 presents that the average attendance of zilla parishad members of Bankura is that higher than that of Paschim Medinipur. Table 7 reveals that the percentage of average attendance among PS members of both zilla sansads are below 40 percent. Table 8 shows that the average attendance among GP members of Paschim Midnapur zilla sansad is 43 percent where as at Bankura zilla sansad that is 29 percent. From tables 9 and 10 we observe that the active participation in the form of observations is very low among every category member either Ps members or GP member.

Table 3 Level of Participation at Bankura Zilla Sansad, February 2004 to August 2007

Date of Meetings	No of Total Members	No. of members Participating in Zilla Sansad meeting along with Officers	No of Total Z P Members	No of Total Z P Members Participated	No of Total P S. Members	No of Total P S. Members Participated	No of Total G P Members	No of Total G P Members Participated	Total Participators of elected Members	Number of Officers
27.02.2004(1st meeting)	473(100)	291(61.25)	41	24(58.54)	242	128(52.89)	190	85(44.74)	237(81.44)	54(18.56)
13.08.2004(2nd meeting)	473(100)	231(48.84)	41	29(70.73)	242	101(41.74)	190	60(31.58)	190(82.25)	41(17.75)
10.03.2005(3rd meeting)	473(100)	187(39.53)	41	22(53.66)	242	97(40.08)	190	55(28.95)	174(93.05)	13(6.95)
09.09.2005(4th meeting)	473(100)	189(39.96)	41	22(53.66)	242	91(37.60)	190	56(29.47)	169(89.42)	20(10.58)
23.08.2006(5th meeting)	473(100)	125(26.43)	41	12(29.27)	242	64(26.45)	190	26(13.68)	102(81.6)	23(18.4)
24.08.2007(6th meeting)	473(100)	186(39.32)	41	24(58.54)	242	93(38.42)	190	50(26.32)	167(89.78)	19(10.22)

Notes: ( ) Figures in parentheses represent percentage share in concerning total members. ZP indicates Zilla Parishad , PS indicates Panchayat Samiti and GP indicates Gram Panchayat.

Source: Zilla Sansad Register.

Table 4 Level of Participation in Paschim Midnapur Zilla Sansad Meetings, February 2004 to February 2007

Date of Meetings	No of Total Members	No. of Participators of Zilla Sansad Members with Officers	No of Total Z.P. Members	No of Total Z.P. Members Participated	No of Total P.S. Members	No of Total P.S. Members Participated	No of Total G.P. Members	No of Total G.P. Members Participated	Total Participators of elected Members	Officers
06.02.2004(1st meeting)	671	352(52.46)	62	10(16.13)	381	198(51.97)	290	142(48.97)	351(99)	1(1)
27.08.2004(2nd meeting)	671	330(49.18)	62	38(61.29)	381	158(41.47)	290	125(43.10)	323(98)	7(2)
28.02.2005(3rd meeting)	671	300(44.71)	62	34(54.84)	381	136(35.70)	290	123(42.41)	296(96)	4(2)
25.08.2005(4th meeting)	671	301(44.86)	62	30(48.39)	381	134(35.17)	290	130(44.83)	297(98)	4(2)
16.02.2006(5th meeting)	671	307(45.75)	62	33(53.23)	381	136(35.70)	290	132(45.51)	304(99)	3(1)
26.02.2007(6th meeting)	671	310(46.20)	62	36(58.06)	381	137(35.96)	290	129(44.48)	304(98)	6(2)

Notes: ( ) Figures in parentheses represent percentage share in concerning total members.

Source: Zilla Sansad Register.

Table 5 Number of Members Participating in Two Districts Zilla Sansad Meetings, February 2004 to February 2007

Districts	Total Members of Zilla Sansad	February 2004(1st meeting)	August 2004(2nd meeting)	February 2005(3rd meeting)	August 2005(4th meeting)	February 2006(5th meeting)	February 2007(6th meeting)	Average
Paschim Midnapur	671 (100)	352(52.46)	330(49.18)	300(44.71)	301(44.86)	307(45.75)	310(46.20)	316(47.09)
Bankura	473 (100)	291(61.25)	231(48.84)	187(39.53)	189(39.96)	125(26.43)	186(39.32)	201(42.49)

Notes: ( ) Figures in parentheses represent percentage share in total members of concerning Zilla Sansad

Source: Table 3 and 4

Table 6 Number of Zilla Parishad Members Participating in Zilla Sansad Meetings, February 2004 to February 2007

Districts	Total Members of ZP at Zilla Sansad	February 2004(1st meeting)	August 2004(2nd meeting)	February 2005(3rd meeting)	August 2005(4th meeting)	February 2006(5th meeting)	February 2007(6th meeting)	Average
Paschim Midnapur	62(100)	10(16.13)	38(61.29)	34(54.84	30(48.39)	33(53.23)	36(58.06)	30(48.38)
Bankura	41(100)	24(58.54)	29(70.73)	22(53.66)	22(53.66)	12(29.27)	24(58.54)	22(53.66)

Notes: ( ) Figures in parentheses represent percentage share in total members of ZP of concerning Zilla Sansad

Source: Table 3 and 4.

Table 7 Number of Members of Panchayat Samiti Participating in Zilla Sansad Meetings, February 2004 to February 2007

Districts	Total Members of PS at Zilla Sansad	February 2004(1st meeting)	August 2004(2nd meeting)	February 2005(3rd meeting)	August 2005(4th meeting)	February 2006(5th meeting)	February 2007(6th meeting)	Average
Paschim Midnapur	381(100)	198(51.97)	158(41.47)	136(35.70)	134(35.17)	136(35.70)	137(35.96)	150(39.38)
Bankura	242(100)	128(52.89)	101(41.74)	97(40.08)	91(37.60)	64(26.45)	93(38.42)	96(39.67)

Notes: ( ) Figures in parentheses represent percentage share in total members of PS of concerning Zilla Sansad

Source: Table 3 and 4

Table 8 Number of Gram Panchayat Members Participating in Zilla Sansad Meeting, February 2004 to February 2007

Districts	Total Members of GP at Zilla Sansad	February 2004(1st meeting)	August 2004(2nd meeting)	February 2005(3rd meeting)	August 2005(4th meeting)	February 2006(5th meeting)	February 2007(6th meeting)	Average
Paschim Midnapur	290	142(48.97)	125(43.10)	123(42.41)	130(44.83)	132(45.51)	129(44.48)	130
Bankura	190	85(44.74)	60(31.58)	55(28.95)	56(29.47)	26(13.68)	50(26.32)	55

Notes: ( ) Figures in parentheses represent percentage share in total members of GP of concerning Zilla Sansad

Source: Table 3 and 4.

4. Nature of Participation in Zilla Sansads

From the minutes of the discussion of zilla sansad meetings of Bankura district we observe that the Maximum representatives of PSs or GPS do not talk any thing. Some officers and karmadhyaks of zilla parishad discuss all about some rural development programmes like IAY, SGRI-I or II, PMGY, etc. Maximum part of their talk contains some advice about the programmes. Further, maximum part of the talks of the representatives of GP and PS are based on complaint against higher authority or higher steps. We observe that there is no proposal of own initiative to solve the minimum problems. There are so many problems or complaints that arise like crisis of funds, deficiency in information, lack of clear conception about programs etc.It may be truly highlighted that the first and the foremost crisis is the crises of fund. The minutes of Paschim Medinipur show huge demands for schemes from different PS and GPs members.

Table 9 Nature of Participation in Paschim Midnapur Zilla Sansad Meetings, February 2004 to February 2007

Total Number of Members Participated	Total Numbers Spoke	Total Z.P. Member Participated	Z.P. Members who spoke	Total P.S. Member Participated	P.S. Members who spoke	Total G.P.. Member Participated	G.P.. Members who spoke	Other Elected Members who spoke (M.L.A. ,M. P.)	Officers and Others Attended	Officers and Others who spoke
352	20	10	01	198	12	142	05	01	01	01
330	28	38	06	158	10	135	06	02	07	04
300	21	34	12	136	02	123	05	01	04	01
301	13	30	04	134	03	130	03	02	04	01
307	18	33	10	136	04	132			03	
310	14	36	11	137	04	129			06	

Source: Zilla Sansad Register.

Table 10 Nature of Participation in Bankura Zilla Sansad Meetings, 2004 February to 2007 August

Total Number of Members Participated	Total Numbers Spoke	Total Z.P. Member Participated	Z.P. Members who spoke	Total P.S. Member Participated	P.S. Members who spoke	Total G.P.. Member Participated	G.P.. Members who spoke	Other Elected Members who spoke (M.L.A. ,M. P.)	Officers and Others Attended	Officers and Others who spoke
291	19	24	03	128	04	85	08		54	04
231	21	29	09	101	04	60	02	02	41	04
187	08	22	07	97	Nil	55	Nil		13	01
189	14	22	05	91	4	56	2		20	03
125	28	12	05	64	09	26	07		23	07
186	10	24	3	93	2	50	4		19	01

Source: Zilla Sansad Register.

5. Schemes Adopted and Receipts and Expenditures of Zilla Parishads

Schemes demanded in the meetings of the zilla sanasad include drinking water, education, roads, electricity, housing, welfare, poverty alleviation, animal husbandry and afforestation in both the districts (Table 11 and Table 12).

Table 11 Number of Members Highlighting the Problems /Demands in Zilla Sansad Meetings of Paschim Midnapur District, February 2004 to February 2007

Problems Demands Highlighted	06.02.2004(1st meeting)	27.08.2004(2nd meeting)	28.02.2005(3rd meeting)	25.08.2005(4th meeting)	16.02.2006(5th meeting)	26.02.2007(6th meeting)
Drinking water	1	1	5	2	1	2
SSK,MSK	6	2	3	7	1	4
Mid day meal	7	2	4	5	1	3
Literacy	2	1	3	5	4	1
Reforms of Roads	2	5	9	5	2	3
Canael Reform	1	1	1	1	2	1
Electricity	2	2	7	8	2	3
Health Sub-Center	6	4	8	13	4	3
IAY,NOAPS,NFBS	2	3	4	2	3	5
SHG	2	1	5	2	1	2
Irrigation Road Reform	2	1	1	1	2	1
Save from elephants attacking		1		1		
Annual distribution			1	2	1	
Crisis of functionaries	2	3	2		4	2
Transformation of land		2	1		2	3
Mforestations	1	2	1	3	1	2
Gardening	2	1	1			1
Repairing of River road			3	1	3	
Total	38	32	59	58	34	36

Source: Sansad Minutes Concerning Zilla Sansad Meetings.

Table 12 Number of Members Highlighting the Problems /Demands in Zilla Sansad Meetings of Bankura District, February 2004 to August 2007

Problems Demands Highlighted	27.02.2004 (1st meeting)	13.08.2004 (2nd meeting)	10.03.2005 (3rd meeting)	09.09.2005 (4th meeting)	23.08.2006 (5th meeting)	24.08.2007 (6th meeting)
SSK,MSK	1	1		1	3	1
Mid day Meal		1	1		1	4
Repair of Roads	2	3	1			
Health Sub-Center		4	1		1	
IAY,NOAPS,NFBS	5	3	1	3	2	2
Save from Elephants Attacking		2				
Crisis of Functionaries	2	1	2	1		1
Repair of River Embankments		2				
Lack of Information	6	2	1	2	3	3
Overall Discussion	5	4	8	4	5	4
Total	21	23	15	11	15	15

Source: Proceedings of Zilla Sansad Meetings.

Zilla Parishads of Bankura and Paschim Medinipur districts adopted various schemes and implemented theme to meet the demands raised in the Zilla Sansad meetings .Their ability to meet the people's demands depends on their receipts of funds from government and own sources, and also on

the expenditure on various projects. Table 13 shows data relating to receipts and expenditure of selected Zilla Parishad during 2000-2001 to 2006-2007. It is observed that during this period Bankura had more receipts in development sector than establishment sector and own resource (OR) sector. It happened mainly due to increasing government persuasion for making meaningful rural development which influences the people's participation in the decision making and implementing directly or throughout their representatives. This table shows that in 2000-2001 Bankura was received Rs 6296.76 lakhs and it expended Rs 4658.63 lakhs. It also shows that the highest receipt Rs 7837.99 lakhs in the year 2001-2002 and the highest expenditure in development sector was Rs 6488.32 lakhs in the year 2002-2003. The lowest receipt in development sector was Rs 3121.27 lakhs in the year 2003-2004 and the highest receipt in same sector was Rs 7837.99 lakhs in 2001-2002. The highest receipt in OR was Rs.419.36 in lakhs and the lowest was Rs. 25.81 in lakhs in 2000-2001.Table 14 shows that Paschim Midnapur district had receipt of Rs. 14438.86 lakhs in year 2001-2002 in development sector and the lowest is Rs 6011.17 lakhs in year 2006-2007 in same sector. The highest expenditure in the development sector was Rs 19279.18 lakhs during the year 2001-2002. the highest total receipt was Rs 15637.57 lakhs during the year 2001-2002.The highest total expenditure was Rs 19597.21 lakhs during the year 2001-2002. This table also shows that this zilla parishad had OR sector of Rs 1007.44 in the year2001-2002. Table 15 reveals that during the period the highest par capita receipt of Paschim Midnapur zilla parishad is Rs 295 and of Bankura zilla parishad Rs 249. It also shows that the lowest par capita total receipt of Paschim Midnapur Zilla parishad was Rs 114 and of Bankura Rs 104. Average per capita total receipt of Paschim Midnapur zilla parishad was Rs 167 and of Bankura Rs 163.

Table 16 shows that the highest per capita total expenditure of Paschim Midnapur is Rs 370 and of Bankura Rs 198. It shows that the lowest per capita total expenditure of Paschim Midnapur in Rs 124 and Bankura Rs 128: It revails that average per capita total expenditure of Paschim Midnapur was Rs 212 and of Bankura Rs 161.Table 17 highlights that Rs 273 was the highest development receipt of Paschim Midnapur and the lowest Rs103. It also shows that the highest per capita development receipt of Bankura was Rs240 and the lowest Rs92. It shows that during the periods average development receipt of Paschim Midnapur was Rs157 and of Bankura Rs 153.Table 18 shows that during the periods the highest per capita development expenditure of Paschim Midnapur was Rs 364 and of Bankura Rs 195. It also shows that the lowest development expenditure of Paschim Midnapur was Rs11 and of Bankura Rs 128. Table 19 shows that receipt and expenditure of different sectors of development of Paschim Midnapur Zilla Parishad . We observe that the highest receipt of rural development sector was Rs 4841.27 lakhs and the lowest Rs 1641.00 lakhs. It also indicates us that the highest expenditure of rural development sector was Rs 5251.65 lakhs and the lowest Rs 1675.00 lskhs. In the public welfare sector the highest receipt was 3247.08 lakhs and the highest expenditure Rs 2763.00 lakhs. Whereas the lowest receipt of this sector was Rs 47.72 lakhs and the lowest expenditure of this sector Rs 782.4 lakhs . This table also shows that the Rs 1226.00 lakhs which is the highest has receiptin year 2001-2002. Where as Rs 2.1 lakhs which is the lowest has receipt in year 2005-2006 in the education sector. In the education sector the highest expenditure was Rs 1270.7 lakhs and the lowest expenditure Rs 107 lakhs. Other important sectors like health, there was no expenditure in 2006-2007 though in that year receipt was Rs 70.63 lakhs. In agriculture and irrigation sector the highest receipt was Rs 3160.00 lskhs and the lowest Rs 109.00 lakhs and the highest expenditure was Rs 6014.84 lakhs and the lowest Rs. 123.11 lakhs. In other important sector

industry and electrification sector the highest receipt was Rs.833.27 lakhs and the lowest Rs 240.79 lakhs. The highest expenditure of the said sector was Rs 866.35 lakhs and the lowest expenditure Rs 166.39 lakhs. Table 20 shows that the highest receipt of rural development sector of Bankura Zilla Parishad was Rs 3942.31 lakhs and the highest expenditure of the same sector wasRs 3359.15 lakhs. In the Public Welfare sector the highest receipt was Rs 1438.2 lakhs and the highest expenditure Rs 1290.44 lakhs . This table also highlights that in the Education sector the highest receipt was Rs 425 37 lakhs and the lowest receipt was Rs 1.95 lakhs. Where as the highest expenditure in the same sector wasRs 317.61 lakhs . From this table we get that the highest receipt of health sector was Rs 334.98 lakhs and the highest expenditure Rs 355.23 lakhs. In agriculture and irrigation sector the highest receipt was Rs. 1298.00 lakhs and the highest expenditure Rs 209.61 lakhs. In Industry and Electrification sector the highest receipt was Rs 450.97 lakhs and the highest expenditure Rs 182.00 lakhs. Table 21 reveals that the highest per capita receipt of rural development sector of Paschim Midnapurr was Rs 84 where the highest per capita receipt of Bankura was Rs 112. The per capita receipt of rural development of Paschim Midnapurr was Rs 62 but Bankura Rs 70. Table 22 reveals that the highest per capita expenditure of rural development of Paschim Midnapur was Rs 90 and of Bankura Rs 95. Though the average par capita expenditure of Paschim Midnapur was Rs 62 and of Bankura Rs 72. Table 23 shows that the highest own receipt of Paschim Midnapur was Rs 19 year 2001-2002 and that of Bankura Rs 12 in 2000-2001. The average own receipt of both districts are same, i.e., Rs 6 during the period.

Table 13 Receipt and Expenditure in Development Sector of Bankura District, 2000-01 to 2006-07 (in Rs Lakh)

		2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
Rural Dev Schemes	Receipt	1890.09	2047.41	2767.15	2018.29	3030 91	3942.31	1044.88
	Expenditure	2320.22	1310.76	2791.01	2232.23	3243.97	3359.15	1612.23
Public Welfare	Receipt	615.96	562.21	523.08	539.00	829.39	1239.93	1438.2
	Expenditure	457.1	572.01	729.02	565.11	841.65	1290.44	1258.92
Finance Commission	Receipt	325.60	393.99	97.80	25.37	327.85	252.77	864.07
	Expenditure	X	291.36	388.4	146.29	458.21	283.01	1023.89
Education	Receipt	13.41	425.37	18.43	6.77	5.17	1.95	5.26
	Expenditure	68.01	12.51	317.61	50.41	27.72	10.63	14.45
Health	Receipt	168.00	334.98	124.35	202.42	223.28	147.08	123.59
	Expenditure	188.64	144.99	355.23	165.08	241.9	354.29	139.96
Agriculture and Irrigation	Receipt	1298.12	443.65	68.37	1.7	132.32	10.95	23.74
	Expenditure	99.79	209.61	207.67	129.28	147.91	41.82	42.27
Transport	Receipt	1380.72	1837.77	115.00	90.7	28.98	11.55	7.72
	Expenditure	535.46	1084.28	653.19	337.22	622.5	34.82	146.94
Fishery and Animal Resource	Receipt	124.96	40.32	7.18	X	7.16	9.41	7.00
	Expenditure	109.95	47.17	128.34	36.85	10.29	13.27	15.58
Forest and Land	Receipt	37.63	243.8	X	11.62	19.65	2.90	30.00
	Expenditure	46.51	127.31	196.3	57.22	94.12	8.03	1.06
Industry and Electrification	Receipt	327.69	355.81	358.90	225.24	450.97	203.69	406.80
	Expenditure	182.06	445.25	342.57	394.49	455.64	213.43	347.1
Misc.	Receipt	114.58	1152.68	80.88	.16	10.82	2.00	11.55
	Expenditure	652.89	943.38	378.98	545.75	21.9	276.59	11.87
Total	Receipt	6296.76	7837.99	4161.14	3121.27	5066.5	5820.54	3962.81
	Expenditure	4658.63	5188.63	6488.32	4659.93	6122.00	5885.48	4614.27

Source: Audit Report.

Table 14 Total Receipt and Expenditure of Bankura Zilla Parishad, 2000-01 to 2006-07 (Rs in Lakhs)

Year	Establishment Receipts	Own Receipts	Development Receipts	Total Receipts	Establishment Expenditure	Development Expenditure	Total Expenditure
2000-01	53.38	25.81	6296.76	6375.97	79.55	4658.63	4738.18
2001-02	158.05	102.94	7837.99	8098.98	92.06	5188.63	5280.69
2002-03	80.9	183.27	4161.14	4425.31	90.05	6488.32	6578.37
2003-04	109.18	303.24	3121.27	3533.69	94.48	4659.93	4754.41
2004-05	127.83	297.74	5066.5	5492.07	98.45	6122.00	6220.45
2005-06	131.16	193.18	5820.54	6144.88	116.94	5885.48	6002.42
2006-07	133.59	419.36	3962.81	4515.76	119.69	4614.27	4612.29

Source: Zilla Parishad Audit Report

Table 15 Receipt and Expenditure of Paschim Medinipur Zilla Parishad (2000-01 to 2006-07) (Rs in Lakhs)

Year	Establishment Receipts	Own Receipts	Development Receipts	Total Receipts	Establishment Expenditure	Development Expenditure	Total Expenditure
2000-01							
2001-02	191.27	1007.44	14438.86	15637.57	317.53	19279.18	19597.21
2002-03	165.42	510.94	8027.46	8703.82	137.66	18695.89	18833.55
2003-04	169.57	111.41	7879.25	8160.23	75.29	7574.06	7649.35
2004-05	233.42	142.99	6841.28	7217.69	215.07	6743.77	6958.84
2005-06	159.02	94.16	8790.15	9043.33	216.85	636.76	7853.61
2006-07	137.23	537.79	6011.17	6686.19	148.57	9491.8	9107.70

Source: Zilla Parishad Audit Report.

Table 16 Per capita Total Receipt Section, 2000-01 to 2006-07 (In Rs)

Name of the Districts	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Average
Paschim Medinipur		295	161	148	128	158	114	167
Bankura	200	249	133	104	159	174	125	163

Source: Table 12 and 12a

Table 17 Per capita Total Expenditure in Two Districts, 2000-01 to 2006-07 (In Rs)

Name of the Districts	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Average
Paschim Medinipur		370	348	139	124	137	156	212
Bankura	148	162	198	140	180	170	128	161

Source: Table 12 and 12a

Table 18 Per capita Development Receipt Section of Selected Two Districts, 2000-01 to2006 -07 (In Rs)

Name of the Districts	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Average
Paschim Medinipur		273	148	143	122	153	103	157
Bankura	197	240	125	92	146	165	110	153

Source: Table 12 and 12a

Table 19 Per capita Development Expenditure in Two Districts, 2000-01 to2006 - 07 (In Rs)

Name of the Districts	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Average
Paschim Medinipur		364	346	137	120	11	162	190
Bankura	146	159	195	137	177	167	128	158

Source: Table 12 and 12a

Table 20 Receipt and Expenditure in Development Sector of Paschim Midnapur District From 2000-01 to 2006-07

		2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
Rural Dev. Schemes	Receipt		3875	3403	1641	2746	4841.3	4234.01
	Expenditure		4346	3115	1675	2667		5251.65
Public Welfare	Receipt		953.8	738.8	80.9	1073	3247.1	47.72
	Expenditure		1167	782.4	841	1099	2762	2365.3
Finance Commission	Receipt		721.9	136	x	X	144.77	503.07
	Expenditure		1006	402.6	x	X	406.48	662.2
Education	Receipt		1226	179.3	27.8	13.9	2.1	13.24
	Expenditure		1271	377.7	175	55.42	1.17	77.85
Health	Receipt		31	779.7	1451	225.2	8.79	70.63
	Expenditure		399.5	1297	1622	425.6	0.51	
Agriculture and Irrigation	Receipt		3160	140.7	109	234.8	266.68	482.54
	Expenditure		3701	6015	572.87	720.48	123.11	331.1
Transport	Receipt		3307	1781	2488	729.5	190.91	54.9
	Expenditure		2834	4235	573	720.5	123.11	331.1
Fishery and Animal Resource	Receipt		221.1	x	x	21.04		1.9
	Expenditure		675.7	444	181	49.01	38.89	10.32
Forest and Land	Receipt		365.7	6.97	36.5	13	13.39	0.12
	Expenditure		588.6	293.1	62	19.66	9.08	15.69
Industry and Electrification	Receipt		402.8	637.9	603	833.27	301	240.79
	Expenditure		614.7	866.4	705	807.11	334.16	166.39
Misc.	Receipt		536.6	224.1	714	1952.02	75.16	362.25
	Expenditure		2676	686.3	716	227.74	1.85	611.3
Total	Receipt		14801	8027	7879	6841	8790.2	6011.17
	Expenditure		19279	18696	7574	6744	7636.8	9491.8

Source: Audit Report

Table 21 Per capita Receipt in Rural Development Scheme in Two Districts, 2000-01 to2006-07 (In Rs)

Name of the Districts	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Total	Average
Paschim Medinipur		73	63	30	49	84	72	371	62
Bankura	59	63	83	59	88	112	29	493	70

Source: Table no 15 and 15a

Table 22 Expenditure in Rural Development Scheme, 2000-01 to2006-2007 (In Rs)

Name of the Districts	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Total	Average
Paschim Medinipur		82	58	30	47	64	90	371	62
Bankura	73	40	84	66	94	95	45	497	71

Source: Table no 15 and 15a

Table 23 Receipts of Own Resource in Two Districts, 2000-01 to2006-07 (In Rs)

District	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Total	Average
Paschim Medinipur		19	09	2	3	2	2	37	6
Bankura	.80	3	5	9	9	5	12	44	6

Source: Table no15 and 15a

The tables above revel that per capita receipts and expenditures of various schemes are not sufficient to meet the demands and problems raised in the Zilla Sansad meetings and this partly explains the relatively low percentage of members attending the Zilla Sansad meetings.

6. Conclusions

Participatory development is well coveted in the democratic framework of the polity of West Bengal. Our study of participatory development in Paschim Medinipur and Bankura districts shows that people's participation in Zilla Sansad meetings is not encourasing and this may be partly explained by relatively low level of receipts and expenditures on various schemed- both total and per capita, and low level of own resources mobilization of Zilla Parisadas. To make district level Panchayats effective institutions of local government, larger devolutions of functions, finance and functionaries are essential.

References :

1. Dore, Ronald and Zore Mars (Editors), 1981, Community Development, Londan, Croon Helm for UNESCO.

2. Mukhopadhyay, Aloke and S. N. Sau, (2002), "The role of Gramsansads in Participatory Rural Development – A study with reference to West Bengal", DRS Occasional Paper No. 11, Dept. of Economics with Rural Development under DRS (SAP), UGC, VU, Midnapore, West Bengal.

3. Giri, P (2004), "Participatory Decentralized Planning and Related Financial Issues", in S. Sau (ed), Participatory Decentralized Planning in India Issues of Functions, Functionaries and Finance, Kolkata : Firma KLM Private Ltd.

Economics of Conchshell Industry in West Bengal

Anamitra Paul[£]

Conchshell Industry being an unorganized sector industry is having simple labour process in most cases, though in some areas it is being modernized. It is conducted in both independent and tied units. Most of the male labourers are household labourers while small number of female labourers are also engaged in the industiral units. While in Paschim Medinipur District artisans work on fresh rawmaterials, in Bankura district most of them work on broken conchshells and with labour intensive technology. Value of output, gross profit, and per capita income of the artisen household vary across the units located in the two districts.

1. Introduction:

The conch shell industry is one of the oldest surviving *traditional* handicrafts of the country. Artisans of conch shell industry use local skills inherited from generation to generation. The conch shell has played an important role in the daily life of the Indian people for thousand of years; for there is evidence of the use of the shell as far back as the early civilizations of the Indus Valley and chank workshops have been discovered all over India dating back more 4000 years. Evidences are based upon Classics, archaeological exploration and historical records. Conch ornaments have a glorious tradition of their own in India; more especially the chank bangles and bracelets which were once regarded as their proud prossession by Indian married woman had an extensive use in this country from the earliest times.

There are different types of conch shell products but among them the main product is 'Sankha'. The extent of conch shell industry has starts from the Southern Coast region of India, because different species of conch shell have been available in this region from the initial period. Mysore, Belari, Hydrabad, Anandapur, Kathiyawar, Gujarat were the main regions for conch shell production in the early period and then Dakha of Bangladesh ,Chittagong , Rangpur, Khulna regions were famous for conch shell industry. In West Bengal the conch shell industrial area comprises Bankura, Burdwan, Howrah, Hoogly, North 24 Paragana, Purba & Paschim Medinipur and Murshidabad districts. India has long been the home of arts and crafts producing traditional handicrafts, utility goods or ancillaries (Bose (1978)). Not only they are a part of the country's rich cultural heritage but they have also been a unifying factor in national life. It is also noted that they often create employment opportunities for disadvantaged social groups [Kathuria(1980)] and one of the strategies proposed for the solution of mass poverty in the third world countries is the expansion of small scale industries, domestic industries and the handicrafts sector in the rural areas[Mies(1981)].

1.1 Importance of Conchshell Industry

Conch shell industry plays an important role - to provide immediate employment, to offer a method of ensuring a more equitable distribution of national income, to facilitate an effective mobilization of resources of capital and skill which might otherwise remain unutilized, to provide the existence of division of labour. Conch shell industry provides employment to large sections of the people. Thus, this craft

[£]Research Scholar, Department of Economics with Rural Development, Vidyasagar University, Midnapore, West Bengal

labour has micro as well as macro significance. Conch crafts labour is highly catalistic in local as well as national level development.

1.2 Review of Existing Literature

Sen (1961) discussed economic behavior of craftsman and production process of conch shell industry of West Bengal and Sikkim. Heppel (1982) highlights that although the religious use of the chank shell is still widespread in India, the main trade of the shell in modern India is between Tamilnadu where the fishery is based and West Bengal where most of the carvers and bangle makers work and where the retail outlets are concentrated. Before partition, the most important centre for chank work was Dacca(now Dhaka, Bangladesh), but although some work is still carried out there for the 10 percent of the population who are Hindus, the majority of the carvers migrated to West Bengal fifty years ago. He also pointed out that Tamilnadu Government sold the entire annual catch of around 40 lakhs (4 million) shells to the West Bengal Handicrafts Development Corporation Limited once a year, but many of the best shells are kept back by the fishermen for private sale. Sen (1935) notes that the use of conch bracelets by Bengali woman was described in ancient bangle literature and suggests that conch craft developed independently in Dhaka. He also discussed different types of conch like Satkania, Panchadana, Tindana, Sadabala, Gara, panboat, Bachachadar etc. He pointed out that conch work area was mainly 'Dakshinatya' region. Evidence of conch work was also found in the ancient capital of Tamil province Korkai and Kayal.

Sarkar (1997) points out those conch bracelets were exported from Dhaka to different parts of India in the past. Records show that conch bracelets worth TK 500, 00 were exported from Dhaka to Nepal, Bhutan, China and Burma annually in the 17th century. The large scale migration of Hindus from East Bengal to India after 1947 led to a decline in the market demand for conch products. Consequently, the conch industry suffered as a whole and the number of artisans engaged in this profession has also declined. Ghosh (1999) highlights the scenario of conch shell industry in Bankura district of West Bengal. Chattopadhaya (2003) stressed on socio-economic study on conch shell art of West Bengal. Chowdhury (2005) discussed about uses of conch, genesis and future of conch shell industry of Dhaka.

Shahjahan (2007) notes that the traditional Shankha industry is now struggling for survival. By the effect of modernization of religious values, the use of Shankhas also is decreasing rapidly. From the brief review of the existing literature it appears that the economics of conch shell industry, present condition of this type of folk art industry, its problems and future and socio-economic condition of conch industrial labourer have not been adequately discussed. The present study aims at removing some of the gaps in the existing literature.

1.3 Objectives of the Study:

The specific objectives of the study are:

i) To analyze the market structure /economics of conch shell industry including production organisation.

ii) To examine the socio-economic conditions of this industrial labourer.

1.4 Database and Methodology

A study on production organizations and their dynamics requires adequate quantitative and qualitative data. Secondary data relating to production organization of this rural industry are not available. Because of the limitations of the secondary data, we have undertaken a detailed primary survey. No secondary source provides ready information on these details. Keeping in mind these limitations, the

primary survey has adopted the multi-stage stratified random sampling method to select sample industrial units from the state. Two districts, namely Paschim Medinipur and Bankura are selected purposively. Sample villages from which data have been collected are shown in Table-1 against the respective blocks , police station and districts. The research is undertaken with a particular focus on labour in the traditional conch shell industry, giving a special emphasis on household craft labour. The objectives are realized mainly with the help of primary data collected exclusively through interviews, discussions, conversations with craftsmen and crafts women based on a pre-tested questionnaire. Instead of collecting data from a particular area of the district, we have randomly selected the sample production units from the districts. For realising the objective, we have attempted to correlate labour with the following variables like gender, caste and community and age. For studying the socio -economic aspects of craftsmen and crafts women, we have taken indicators like education, housing conditions, saving and income. we have used simple statistical tools.

Table 1 Craft village under Sample Blocks, Police Stations and Districts and Number of Sample Conch shell Craft Households in Sample Districts

District	Block	Police Station	Village	Number of craft units selected	
				Independent	Tied with Mahajan
Paschim Medinipur	Daspur-1	Daspur	Kadilpur	10	5
Paschim Medinipur	Daspur-1	Daspur	Kunjapur	3	1
Paschim Medinipur	Daspur-1	Daspur	Kalmijore	8	1
Paschim Medinipur	Daspur-1	Daspur	Basudevpur	2	-
Total				23	7
Bankura	Indpur	Indpur	Hatgram	25	5
Total				**48**	**12**

Source: Field Survey

2. Economics of Conchshell Industry

Conchshell being an unorganized manufacturing carried out mostly in the household premises it has its vatied labour process.

Labour process and production organization

Labour process is the creation of use value in a commodity. Karl Marx discussed the labour process historically. It evolves through different modes of prduction over years. Initialy it was mainly a household industry use in highly labour industry technology. Gradually modern technology is being used. The present tendency of technology and other inputs is towards mechanization in almost all stages of production. Electricity is used as an input in production. Just like the technology of any other handicrafts industry, in conch shell industry which is household handicraft is highly labour intensive.

The tools used in making conch ornaments include conch saws, hammers, drills, and chisels. Hydrochloric acid is used to clean the outer layer of the conch, while nitric acid and zinc powder are used to fill up the holes in the conch. Nowadays electric saws are used to cut conchs. Another important tool used in the craft is a round wooden stick to which a rough mixture of sand, resin, incense and mustard

oil is applied. This tool is used to smoothen the inside of conch-shell bangles. Several kinds of files or rasps are used to smoothen the rough edges of the bangle after it has been sliced off. *Buli*, a kind of nib-chisel, is used to engrave and make designs on the ornaments. A special type of drill is used to make holes in bangles, through which gold wire may then be threaded.

Cutting, cleaning, carving, sketching, designing and polishing are the six steps for making an artistic shankha. After cutting and cleaning, pairing and rounding has been done by machine.

The kinds of labour involved in conch shell industry fall under three categories, namely full-time labour, part-time labour, contract labour, family labour, daily labour .Several distinct stages in the production process are adopted for creation of use value as well as aesthetic value of the products, which vary across units/enterprises, products and organizations. In general, both skilled and unskilled labourers are accustomed to distinct stages of work. The larger independent units generally perform through regular hired workers at their own household premisies factory-shade where employees perform their different stages of works. Raw materials are distributed to tied artisans employed on piece rate basis. Some units also take raw materials from groups of merchants or traders who own fixed assets, tools and equipments of production, at fixed rates of contractual payment (locally known as *bani* rate). Tied artisans are highly specialised in particular types of jobs like structuring, polishing or designing as well as producing particular products. Tied artisans generally perform all the stages of work. Both men and women participate in every part of the work while owners or artisans independently manage and produce taking the help of household labourers. A few units also employ hired labourers as assistants to master artisans, on daily wages and mid-day meals at the owners' houses. Tied artisans generally do all works in household premises. In conch-shell industries, stages of works are found in general, each using simple tools, cutting machines or grinder machines. Both independent and tied artisans are found in this industry, specialised in certain artistic and decorative products. Independent units perform two or three stages, e.g., rubbing, polishing, pasting etc. at own workshops and offer the products to tied artisans on contractual terms. There exists wide division of labour. In Table-2 it is discuss that type wage share at different stages of work of production process of 'Sankha'.

Table 2 Type of Wage share at Different Work Stage for prepare a piece of conch product 'Sankha'

Sl.no	Stage of Work	Work done by Man/ Machine/ Both	Basis of Wage (Per piece Pair)	Wage Rate for Man	Machine Charge(Rs)	Total cost(Rs)
1	Drawing with pencil on intact conchshell for cutting	Man	-	-	-	-
2	Latha Cata/Patta Cata/DebiCata	Both	Piece	1.50	1.50	3.00
3	Breaking the conch	Both	Piece	1.25	0.25	1.50
4	Bindani Drilling of conch	Man	Piece	0.50	-	0.50
5	Majar	Both	Piece	0.30	0.30	0.60
6	Cutting	Both	Piece	0.25	0.25	0.50
7	Size maintaining for design	Man	-	-	-	-
8	Grinding	Both	Piece	2.00	0.50	2.50
9	Design of Sankha (for Chur)	Both	Pair	7.00	0.50	7.50
10	Acide Polish	Man	Pair	1.00	-	1.00
11	Wax finishing	Man	Pair	0.50	-	0.50
12	Ararut pasting & Pair wise Binding of Sankha	Man	Pair	0.50	-	0.50

Source: Field Survey

Labour in Conch shell industry

For analysing different aspects of household handicrafts labour, we have taken the following variables like caste and community, gender and age. This is done for identifying whether there is any predominance of caste and community, gender and age in any form of household craft.

Table 3 shows the distribution of industrial units by number of workers. Number of industrial units is highest in 1-4 size of labour recording 81.67 percent of total sample units followed by 5-9 size class of labour (15.00 percent) (Table 3) .It is recorded that 85 percent of units are completely dependent on household labour having no reliance on hired labour. Only residual 15 percent units depend on hired labour along with their household labourer (Table 4).

Table 3 Frequency Distribution of Sample Craft Units by Number of Workers and Production Organisation in Paschim Medinipur and Bankura Districts

Districts	No. of workers/ Organisation	Number of Workers					Number of Total Units
		1-4	5-9	10-19	20-30	31-49	
Paschim Medinipur	Independent	17(73.91)	4(17.39)	1(4.35)	-	1(4.35)	23(100.00)
	Tied	7(100.00)	-	-	-	-	7(100.00)
Bankura	Independent	20(80.00)	5(20.00)	-	-	-	25(100.00)
	Tied	5(100.00)	-	-	-	-	5(100.00)
Total		**49(81.67)**	**9(15.00)**	**1(1.67)**	**-**	**1(1.67)**	**60**(100.00)

Source: Field survey; *Note:* Parentheses indicate the percentage shares.

Table 4 Frequency Distribution of Sample Craft Units by Number of Hired Workers and Production Organisation in Paschim Medinipur and Bankura Districts

Districts	Organisation	Number of Hired Workers					Number of Total Units
		0	1-2	3-5	6-10	11& above	
Paschim Medinipur	Independent	14(60.87)	6(26.09)	1(4.35)	1(4.35)	1(4.35)	23(100.00)
	Tied	7(1000	-	-	-	-	7(100.00)
	Total	**21(70.00)**	**6(20.00)**	**1(3.33)**	**1(3.33)**	**1(3.33)**	**30(100)**
Bankura	Independent	25(100)	-	-	-	-	25(100.00)
	Tied	5(100)	-	-	-	-	5(100.00)
	Total	**30(100)**	-	-	-	-	**30(100)**
Total		**51(85.00)**	**6(10.00)**	**1(1.67)**	**1(1.67)**	**1(1.67)**	**60(100.00)**

Source: Field survey; *Note:* Parentheses indicate the percentage shares.

We have analyzed the household handicraft labour on the basis of gender to know the extent of male-female participation (Table 5). In this traditional handicraft, there is involvement of both the male and female labourers. It is observed that the female participation rate is highest in Bankura district (37.85 per cent) than in Paschim Medinipur district (22.22 per cent).But male participation rate is more in Paschim Medinipur district (77.78 per cent) compared to Bankura district (62.15 per cent),

Table 5 Distribution of Household Workers by sex and Production Organisation in Paschim Medinipur and Bankura Districts

Districts	Organisation	No. of Household Workers		Total Workers	% of Household Workers by sex	
		Male	Female		Male	Female
Paschim Medinipur	Independent	53	14	67	79.10	20.90
	Tied	10	4	14	71.43	28.57
	Total	**63**	**18**	**81**	**77.78**	**22.22**
Bankura	Independent	41	44	85	48.24	51.76
	Tied	6	5	11	54.55	45.45
	Total	**47**	**49**	**96**	**48.96**	**51.04**
Grand Total		**110**	**67**	**177**	**62.15**	**37.85**

Source: Field Survey

Age is the other variable which is important with the household handicraft labour. Age-wise household handicrafts labour shows the following features (Table 6 and Table 7). Child labour is not much (14 percent) involved in any of the sample household handicraft labour. A scrutiny of the table 6 shows that 15 male persons are in the at age group 11-14 and it constitute 13.64 percent of total male persons. Participation of young generation in this household handicraft is substantial (59 percent overall). The persons of 15-44 years participate to the extent of 59.09 percent which is highest followed by the age group 45-59 (25.45 percent).The female participation having the 15-44 age group is highest (74.63 percent) followed by the age group of 45-59(25.37 percent) (Table 7).

Table 6 Distribution of Male Workers by Age and Production Organisation in Paschim Medinipur and Bankura Districts

Districts	Organisation	Age of Male Workers				Number of Total workers
		11-14	15-44	45-59	60-64	
Paschim Medinipur	Independent	4 (7.55)	32 (60.38)	15 (28.30)	2 (3.77)	53 (100)
	Tied	2 (20.00)	5 (50.00)	3 (30.00)	0	10 (100)
Bankura	Independent	8 (19.51)	25 (60.98)	8 (19.51)	0	41 (100)
	Tied	1 (16.67)	3 (50.00)	2 (33.33)	0	6 (100)
Grand Total		**15 (13.64)**	**65 (59.09)**	**28 (25.45)**	**2 (1.82)**	**110 (100)**

Source: Field survey; *Note:* Parentheses indicate the percentage shares.

Table 7 Distribution of Female Workers by Age and Production Organisation in Paschim Medinipur and Bankura Districts

Districts	Organisation	Age of Female Workers				Number of Total Workers
		11-14	15-44	45-59	60-64	
Paschim Medinipur	Independent	0	9 (64.29)	5 (35.71)	0	14 (100)
	Tied	0	3 (75.00)	1 (25.00)	0	4 (100)
Bankura	Independent	0	34 (77.27)	10 (22.73)	0	44 (100)
	Tied	0	4 (80.00)	1 (20.00)	0	5 (100)
Grand Total		**0**	**50 (74.63)**	**17 (25.37)**	**0**	**67 (100)**

Source: Field survey; *Note:* Parentheses indicate the percentage shares.

Table 8 shows distribution of household workers by number of days worked last year. From this table it is observed that 65 percent of sample units has number of days worked last year belonging to the size class of 326 – 349 man days followed by 26.67 percent of units having 300-325 days of work.

Table 8 Distribution of Household Workers by Number of Days Worked Last Year and Production Organisation in Paschim Medinipur and Bankura Districts

Districts	Organisation	Mandays Worked			Number of Total Units
		300-325	326-349	350-365	
Paschim Medinipur	Independent	5(21.74)	16(69.57)	2(8.70)	23(100)
	Tied	1(14.29)	6(85.71)	-	7(100)
Bankura	Independent	7(28.00)	15(60.00)	3(12.00)	25(100)
	Tied	3(60.00)	2(40.00)	-	5(100)
Total		**16(26.67)**	**39(65.00)**	**5(8.33)**	**60(100)**

Source: Field survey; *Note:* Parentheses indicate the percentage shares.

Value of Output

In Paschim Medinipur district 30 percent units recorded value of output worth Rs 15th lakh to Rs 19.99 lakh, 26.67 units produce output worth Rs 10 lakh to Rs 14.99 lakh, 16.67 percent Rs 20 lakh to Rs 24.99 lakh. 10 percent units recorded value of output, worth Rs 50 lakh and above. In Bankura district 33.33 percent unis recorded annually value of output worth Rs10000 to 30999, followed by 20 percent of units produce value of output worth Rs 36000-44999 (Table 9). The differential in value of output presented in this table between Paschim Medinipur and Bankura is explained by the pattern of conchshell products –the former works on the whole conchshell and the latter on broken pieces.

Table 9 Distribution of Household Units by Value of Output

Districts	Organisation	Value of Output							Number of Total Units
		10.00-14.99 lakh	15.00-19.99 lakh	20.00-24.99 lakh	25.00-29.99 lakh	30.00-39.99 lakh	40.00-49.99 lakh	50.00 lakh & above	
Paschim Medinipur	Independent	3(13.04)	7(30.43)	5(21.74)	-	4(17.39)	1(4.35)	3(13.04)	23(100)
	Tied	5(71.43)	2(28.57)	-	-	-	-	-	7(100)
Total		**8(26.67)**	**9(30.00)**	**5(16.67)**	-	**4(13.33)**	**1(3.33)**	**3(10.00)**	**30(100)**
Districts	Organisation	25000-30999	31000-35999	36000-44999	45000-55999	56000-65999	66000-75999	76000 & above	Number of Total Units
Bankura	Independent	7(28.00)	-	6(24.00)	2(8.00)	5(20.00)	2(8.00)	3(12.00)	25(100)
	Tied	3(60.00)	-	-	2(40.00)	-	-	-	5(100)
Total		**10(33.33)**	-	**6(20.00)**	**4(13.33)**	**5(16.67)**	**2(6.67)**	**3(10.00)**	**30(100)**

Source: Field survey; *Note:* Parentheses indicate the percentage shares.

Gross Profit

In Paschim Medinipur district 30 percent units recorded gross profit of Rs 6.00 lakh to Rs 7.50 lakh, 23.33 units Rs 3.00 lakh to Rs 4.50 lakh, 16.67 percent units Rs 4.51lakh to Rs 5.99 lakh, 10 percent units

recorded gross profit of Rs 50 lakh and above. In Bankura district 33.33 percent units recorded gross profits Rs5000 to 7999 followed by 30 percent of units recording gross profit of worth Rs 11000-Rs 14999.(Table 10)

Table 10 Distribution of Household Units by Gross Profit

Districts	Organisation	Gross Profit							Number of Total Units
		3.00-4.50 lakh	4.51-5.99 lakh	6.00-7.50 lakh	7.51-9.99 lakh	10.00-14.99 lakh	15.00-19.99 lakh	20.00 lakh & above	
Paschim Medinipur	Independent	3(13.04)	4(17.39)	7(30.43)	2(8.70)	4(17.39)	1(4.35)	2(8.70)	23(100)
	Tied	4(57.14)	1(14.29)	2(28.57)	-	-	-	-	7(100)
Total		**7(23.33)**	**5(16.67)**	**9(30.00)**	**2(6.67)**	**4(13.33)**	**1(3.33)**	**2(6.67)**	**30**(100)
Districts	No. of workers/ Organisation	5000-7999	8000-10999	11000-14999	15000-18999	19000-21999	22000-24000	25000 & above	Number of Total Units
Bankura	Independent	7(28.00)	3(12.00)	8(32.00)	4(16.00)	1(4.00)	2(8.00)	-	25(100)
	Tied	3(60.00)	1(20.00)	1(20.00)	-	-	-	-	5(100)
Total		**10(33.33)**	**4(13.33)**	**9(30.00)**	**4(13.33)**	**1(3.33)**	**2(6.67)**	-	**30**(100)

Source: Field survey; *Note:* Parentheses indicate the percentage shares.

Annually & Monthly Per Capita Income of Artisan Households

It is observe that 33.33 percent of the sample households belong to the size category of Rs 100000 to Rs 149999 and Rs 8451-Rs 12450 respectively annual per capita income and monthly per capita income followed by 20 percent of households in the size class of Rs 75000 to Rs 99999 and Rs 6251-Rs 8450 respectively in Paschim Medinipur district. In Bankura district 46.67 percent households have annual per capita income and monthly per capita income ranging between Rs 4000 and Rs 5999 and Rs 351 and Rs 500 respectively followed by 30 percent having annual and monthly per capita income ranging from Rs 2000 to Rs 3999 and Rs 167-Rs 350 respectively.(Table 11 and Table 12).

Table 11 Distribution of Household units by Annually Per Capita Income

Districts	No. of workers/ Organisation	30000-50999	51000-74999	75000-99999	100000-149999	150000-199999	200000 and above	Number of Total Units
Paschim Medinipur	Independent	-	2(8.70)	5(21.74)	8(34.78)	4(17.39)	4(17.39)	23(100)
	Tied	2(28.57)	2(28.57)	1(14.29)	2(28.57)	-	-	7(100)
	Total	**2(6.67)**	**4(13.33)**	**6(20.00)**	**10(33.33)**	**4(13.33)**	**4(13.33)**	**30**(100)
Districts	No. of workers/ Organisation	2000-3999	4000-5999	6000-7999	8000-9999	10000 and above		Number of Total Units
Bankura	Independent	5(20.00)	13(52.00)	2(8.00)	3(12.00)	2(8.00)		25(100)
	Tied	4(80.00)	1(20.00)	-	-	-		5(100)
	Total	**9(30.00)**	**14(46.67)**	**2(6.67)**	**3(10.00)**	**2(6.67)**		**30**(100)

Source: Field survey; *Note:* Parentheses indicate the percentage shares.

Table 12 Distribution of Household Units by Monthly Per Capita Income

Districts	2500-4250	4251-6250	6251-8450	8451-12450	12451-16650	16650 & above
Paschim Medinipur	2(6.67)	4(13.33)	6(20)	10(33.33)	4(13.33)	4(13.33)
Districts	167-350	351-500	501-650	651-850	850 & above	
Bankura	9(30)	14(46.67)	2(6.67)	3(10.00)	2(6.67)	

Source: Field survey; Note: parentheses indicate the percentage shares.

Ratio of Industrial Income

In Paschim Medinipur district 60 percent of the households have ratio of industrial income to total household income equal to one(1), i.e., these units have no other income and 40 percent units have the ratio from 0.51 to 0.99. In Bankura district 13.33 percent of the households have industrial income and total household income ratio equal one(1), i.e., these units have no other income, and 86.67 percent units have the ratio from 0.51 to 0.99; these units have other sources of income mainly agriculture. Among 60 selected sample units of both districts taken together most of the selected units (63.33 percent) belongs to the size class of ratio of industrial income to total household income in the range 0.51-0.99 and only 36.67 percent units have no other source of income, i.e., their ratio is one (1) (Table-13)

Table 13 Distribution of Industrial units by Ratio of Industrial Income to Total Household Income

Districts	Organisation	Ratio of Industrial Income		Number of Total Units
		0.51-0.99	1	
Paschim Medinipur	Independent	8(34.78)	15(65.22)	23(100)
	Tied	4(57.14)	3(42.86)	7(100)
	Total	**12(40.00)**	**18(60.00)**	**30**(100)
Bankura	Independent	21(84.00)	4(16.00)	25(100)
	Tied	5(100)	-	5(100)
	Total	**26(86.67)**	**4(13.33)**	**30(100)**
Gross Total		**38(63.33)**	**22(36.67)**	**60(100)**

Source: Field survey, *Note:* Parentheses indicate the percentage shares.

Marketing Channel

The major marketing channels constitute door-to door sales, sales in *hat*, *bazaar* etc., supplying the product to fixed sellers, sales through own counter, contract with local trader; or middlemen of traders, contract with master artisans, or wholesale traders, or exporters and export agencies, sales through own salesman, through advertisement, contracts with cooperative society, marketing societies, fairs etc. Moreover, small independent artisans suffering from dearth of working capital and proper information about the market carry on sales within the local level (vendor and local retailer). Limited asset endowments, structural bottlenecks of the rural economy and information gaps make petty artisans almost entirely incapable of receiving institutional loans for capital accumulation (Maiti, 2004). The higher the capital, the more diversified would be the market channels available. While small independent artisans

without town shops are able to sell their products to wholesalers who have intimate and strong market connections, those who own shops receive diversified market channels to reach local consumers and also local wholesalers and even indigenous merchants. Thus, formal or directory units have diversified marketing channels whereas small and petty units depend on the local market; but in order to avail the external market they get tied to master enterprises (or formal producers) and traders. Most of the artisans have become the clients for raw materials to the *mahajans* and they control the prices, quality and frequency of supply. The intervention of *mahajans* in this industry and persistent dependence on them by the artisans has forced them to work on *bani* (making charge) system. In conch shell industry producers at remote rural areas have been linked with important cities and towns directly or through traders or formal producers. Raw materials for conch shell industry come from coastal town of southern part of India and traders of different town buy and take the final product. The conchshell producer sells their products through three different way namely i) direct selling at Hat, Shop or Fair as a retailer ii) through middleman at wholesale basis iii) through direct selling and through middleman. Our field data reveals that in Bankura district 83.33 percent of household units sell their products through direct selling but in Paschim Medinipur district it is 66.67 percent .Product selling procedure through direct selling is more in both districts. In Paschim Medinipur district 33.33 per cent product selling through middleman is higher than in Bankura district (16.67 percent).The conch shell producers marketing area comprises local market (23.33 %), block level area (51.67 %) and district level area (25 %). Overall 55 percent household units sell their products on wholesaler basis and 45 percent on retail basis. In Paschim Medinipur district percentage of wholesale businessmen (63.33 per cent) is more than in Bankura district (45.67 percent) but the percentage of retailer businessman of household units is higher in Bankura district (53.33 percent) than in Paschim Medinipur district (36.67 percent).It is observed that in Bankura district 66.7 percent of units sell their products at Hat but in Paschim Medinipur district it is 46.7 percent and 53.33 percent units in Paschim Medinipur district sell their product at Shop/Fair but in Bankura district it is lower (33.33 percent) (Table 14, 14a).

Table 14 Distribution of Household Units by Marketing Pattern

Districts	Marketing Channel			Marketing Area			Type of business		Marketing Place		No. of Total Units
	Direct selling	Middle man	Both	Local market	Block level area	District level area	Whole saler	Retailer	Hat	Shop/Fair	
Paschim Medinipur	20	10	8	6	18	6	19	11	14	16	30
Bankura	25	5	15	8	13	9	14	16	20	10	30
Total	45	15	23	14	31	15	33	27	34	26	60

Source: Field survey; Note: parentheses indicate the percentage share

Table 14a Percentage Distribution of Household Units by Marketing Pattern

Districts	Marketing Channel			Marketing Area			Type of business		Marketing Place		No. of Total Units
	Direct selling	Middle man	Both	Local market	Block level area	District level area	Whole saler	Retailer	Hat	Shop /Fair	
Paschim Medinipur	66.67	33.33	26.7	20.00	60.00	20.00	63.33	36.67	46.7	53.33	100
Bankura	83.33	16.67	50.0	26.67	43.33	30.00	46.67	53.33	66.7	33.33	100
Total	75.00	25.00	38.3	23.33	51.67	25.00	55.00	45.00	56.7	43.33	100

3. Conclusions

Most of the industrial units employ their family labour including females who do not like to work in other's firm. The annual income from this industry constitutes a high percentage of family income. The conch craft survives as it is seen that the number of shops have been increasing. Traders invest in conch product trading because it give them very high returns. Earlier,only Shankari community people were only linked with conch shell production work as their hereditary work but now it is not only confined to shankari cast people. Now Muslim community people and Kumbhakar cast are also engaged it due to very high returns from it. Members of particular shankari caste family are inclined to working with family occupation from childhood and have hereditary skill but now other caste people get trained with this type of work and continue this craft work. At present time conch products also available in Jewelry shop, Stationary shop which was previously restrained. Mechanization in conch shell industrial work, for example grinder machine with the help of electricity, increases the production of conch product with little time span, helps to reduce the cost of production and increases the quality of products. Some government institutions, namely DIC render valuable services for development of conch shell industry, conduct training programme, national fair of crafts and award prizes and incentives so that artisans participating in them feel encouraged. Since Hindu married women are used to wearing bangle and ring made of conch shell as ritual custom, this generate demand and consequently conch shell industry survives.

References

1. W.W.Hunter, *Statistical Account of Bengal,* London 1875, P-146.
2. Zulekha Haque, *Gahana : Jewellary of Bangladesh,* Dacca 1984 , P-102.
3. James Hornel, *The Chank Bangle Industry: Its Antiquity and Present condition,Memories of Asiatic Society Journal* , Vol-3 Calcutta 1982.
4. Dines Chandra Sen, *Brihatbanga* , Vol-2, Calcutta 1935.
5. Pllab Sengupta, *Lokosanskritir Simana O Swarup,* Calcutta 1995.
6. *Biswakosh, Vol-21,* Kolkata.
7. *Encylopaedia of world art,* Vol-5, P-470.
8. *Encylopaedia Indica,* Vol-20, 1988, P-154.
9. *Encyclopaedia Britanica* , Vol-6, 1768, P-201.

10. B.Gosh, *Traditional Arts and Crafts of West Bengal* , Calcutta 1981.

11. E. A. W. Wester Marck, *History of Human Marriage,* Vol-2, New York 1922.

12. Jonathan Mark Kenoyer, *Ancient Cities of the Indus Valley Civilization* , New York Delhi 1998.

13. R.K. Tripathi, *Social and Religious Aspects in Bengal Inscriptons,* Kolkata 1987.

14. G.C.M. Birdwood, *The Arts of India* , British Book Company 1986.

15. N.K.Basu, *Cultural Anthropology,* Kolkata 1958.

16. B.N. Mukherjee, *Decipherment of Shell Script,* State Museum Lucknow, 1983.

17. H.H.Risely, *The Tribes and Castes of Bengal , Ethnographic Glossary,* Calcutta 1891.

18. *Cencus of India 1961, Vol-16, West Bengal &Sikkim Part 7-A(1),Handicrafts Survey Mono graph on Conch shell products by investigator Dipenkar Sen and Final Draft, Editing, Super vision and Guidence Sukumar Sinha,* P-(30-50).

19. Smriti Kumar Sarkar, *From autonomy of Subordination: A study of the changing organization of artisanal production in colonial Bengal : the cases of kansaries and the sankharis, The Calcutta Historical Journal* , Vol-16 No.2 ,1994, P-107.

20. B.N. Mukherjee , *Decipherment of Shell Script 1983* , P-9,10,15.

21. Pradip Kumar Gosh , *Lokosilpa: Bankurar Sankhasilpa, Lokosanskriti Research Patrika 12th year 1999* , P117.

22. Binoy Gosh, *Loko Sanskritir Samajtatya,* Calcutta 1979(1386).

23. Kamal Kumar Goshwami, *Kalmijore Conchshell Industry and its different aspects, Sharadiya Chatuya Sangbad,1991(1398).*

24. *Ghatal Year Book 1990-91.*

25. *Lokoshilpa of Midnapore,District Lokoshilpa Parichaya Grantha,Midnapur, Lokosanskriti O Adibasi Sanskriti Centre,* Information and Cultural Department, West Bengal.

Technical Efficiency of Owners and Tenants in Paddy Cultivation : A Study on West Bengal

Subrata Kundu*

In this paper we have estimated farm-specific technical efficiency for paddy using Stochastic Frontier Production Function approach. For this study we have used farm-level cross section data pertaining to the year 1999-2000 for Midnapur district, collected by the Ministry of Agriculture, Government of West Bengal through the Cost of Cultivation Scheme. Midnapur district was purposively selected since it has varying socio-economic and geographical features. The analysis of technical efficiency indicates that on the average tenant-cultivated farms are more efficient than others and there exists some scope to improve the productivity of paddy with the existing level of input use and the available technology for all types of tenure. This study can prove useful to policy makers and researchers in evaluating the performance of West Bengal agriculture.

1. Introduction

The efficiency of resource use under different types of tenure is the subject of discussion which received considerable attention, both theoretical as well as empirical, among the economists. Since the time of Adam Smith, economists have argued that share tenancy is inefficient. In this case, outputs being shared with the landlord, a share tenant gets only a portion of what he or she produces. Hence, the tenant does not have the incentive to cultivate efficiently on share-rented land and the tenant can be expected to undersupply resources [Bardhan and Srinivasan, 1971; Bell and Zusman, 1976; Braverman and Srinivasan, 1981; Braverman and Stiglitz, 1982]. The result is a Paretian inefficiency. Share tenancy, however, has survived the modern land reform era in developing as well as developed economies. This persistence has led many economists to attempt an economic explanation of share tenancy.

One of the important measures of overall resource use efficiency is technical efficiency. The ratio between the actual and the potential outputs is defined as a measure of technical efficiency of an economic decision-making unit in the literature and the production environment in which a farm/firm operates (socio-economic characteristics) determines the variations in the efficiency levels of the firm household (Kalirajan and Shand, 1994). Improving Technical efficiency is important to reap the potential benefits of the existing technology, rather than searching for new technology (Kalirajan *et al.*, 1996).

So far, only a few studies have attempted to measure the efficiency of resource use under different types of tenure in West Bengal agriculture. A study was carried out by Chattopadhyay (1979). He used a sample of 808 farms selected from 12 villages of Sriniketan in Birbhum district of West Bengal during 1976-77. The study indicated that owner-cultivators cultivate their land more intensively than the tenant-

*Associated with The Department of Economics with Rural Development, Vidyasagar University, Midnapore, West Bengal, India, E-mail: sub.kundu@yahoo.co.in

cultivated farms of the corresponding class of holdings except the biggest one. In fact, the large tenant cultivators behave more or less in the same fashion as owner cultivators in so far as intensities of different types of inputs as well as productivity of land are concerned. The evidence thus did not indicate inefficiencies in the use of land under large tenant cultivators. This, however, was not true in the case of small tenants.

Similar attempts were made by some other researchers (e.g., Bhaumik, 1993; Chattopadhyay and Sarkar, 1997) to study tenurial efficiency in different regions of India. Bhaumik's (1993) sample consisted of 224 households spread over four blocks of Midnapore district of West Bengal during 1986-87. He examined the differences in performances of the households across various plots of land in terms of the value of output per acre and the intensity of input use (bullock labour, human labour and material inputs) per acre. He divided the sample of farmers into three categories: owners, share-croppers and fixed-rent tenants and compared the performances of these three types of tenure. The study was conducted for a number of crops (such as aman paddy, boro paddy, potato and sugarcane). He observed that only for paddy, share-cropped plots showed greater degree of efficiency than the owned plots. On the other hand, the intensity of resource use as well as land productivity appeared to be invariant between owned and fixed-rent plots.

Chattopadhyay and Sarkar (1997) studied the problem with reference to 150 farming households situated in North 24 Parganas district in West Bengal. Using the variables capturing output productivity and intensity of input use, they observed that there was no remarkable difference in the utilisation of different types of inputs (human labour, bullock labour, material inputs etc.) and output per unit of land among the groups of tenants and owners. A multiple regression set-up using a number of variables suggested that fertilizer and irrigation are the most important variables in explaining the variations in agricultural output as well as yield per acre for the region under study[1].

A more recent study was done by Chattopadhyay and Sengupta (2001). They have used farm-level disaggregate data pertaining to the year 1989-90 for West Bengal. They used data envelopment approach which involves no assumptions whatsoever about relation between dependent and independent variables of the production function. Their analysis shows that the medium-size farms belonging to both owner and tenant categories are efficient. Among the factors that help them to be efficient, the availability of irrigation seems to be very important. Use of machine has no positive role while non-irrigation material cost provides very little support.

This study attempts to measure the farm-specific technical efficiency of different types of tenure in West Bengal agriculture. In the present study, we employ the recent stochastic frontier methodology to estimate the technical efficiency. This methodology has certain advantages over the estimation approach followed by the earlier study. For instance, it accounts for random factor that are outside the control of production units (such as, crop diseases, flood and weather) but can significantly affect technical efficiency.

The paper proceeds as follows. In section (II), we give a brief description of the data used. Section (III) provides methodological framework. The SFA approach for measuring efficiency is elaborated in this section. Section (IV) provides the empirical results. Finally in section (V) the study is concluded.

2. Data Description

Farmers in underdeveloped areas exhibit wide differences in their resource use pattern. It thus seems interesting to study scale efficiency differentials among farmers of different categories and to analyze the factors that may lead to such difference in observed behaviour. In our exercise, for example, we have considered the cultivation of different crops in the Midnapur district of West Bengal, India. West Bengal is one of the provinces in India where large-scale land reforms have resulted in breaking up of vested interests in land holding pattern to a certain extent (Dyer, 1998). Several authors argued that such measures have contributed to significant efficiency gains (Banerjee, Gertler and Ghatak, 2002). It thus remains imperative to examine the extent to which these gains have been translated in production economies. However since this is a micro-level analysis, it is difficult to include policy variables directly. Their effects can only be gauged indirectly. In the region under study paddy is the main crop (Dyer 1998). The crop is generally cultivated more than once a year (normally referred to as aman, boro and aus). Aman is the traditional variety while boro is the modern variety with high return, huge investment and large risk involved. In recent years, aus have been substituted by some other crops (such as potato, wheat, pulses, oilseed, vegetables etc.).

The data used in this exercise were collected by the Ministry of Agriculture, Government of West Bengal through the Cost of Cultivation Scheme. The data were collected for every district of this state each year. A multi-stage random sampling design was adopted from blocks to village and then from village to households. In this way, there are in all 180 sample farmers out of which information was available for only 166 farmers. Out of these 166 farmers, only 109 cultivates paddy. In this study farm-level disaggregate data are used pertaining to the year 1999-2000 for Midnapur district only. Midnapur district was purposively selected since it had varying socio-economic and geographical features.

This data set supplies information on various inputs like human labour, bullock labour, fertilizer, manure, machine and output of all the crops cultivated both in value and quantitative terms. For our efficiency estimates we have taken several inputs namely Labour (human labour), Capital[2], Intermediate input[3] which presumably explain production of most of the crops very well. All these variables are measured in per unit area. The time period is one year. Information is also provided for other items of farm expenditure as well.

3. Methodological Framework

Analytical Methods

The idea of measuring efficiency of firms was first proposed by Farrell (1957). He introduced the concept of frontier production function in measuring efficiency of productive units. A frontier production function refers to the maximum level of output that can be produced from a given set of inputs. Similarly, a frontier cost function provides us with the information about the minimum expenditure required to produce a given level of output at fixed input prices. Following these it is possible to define frontier profit function as a function that shows the maximum profit available at given levels of output prices and input prices. Specifying the frontier functions, Farrell measured efficiency of productive units through comparisons of the actually observed values of a variable and its frontier value i.e., the value given by the frontier function.

In order to comprehend Farrell's methodology, let us consider an input vector $x^t \in R_+^n$ that can produce an output vector $y \in R_+^m$ The efficient production frontier $F(x)$ corresponding to the input vector x is then defined as :

$F(x) = \{ y \in R_+^n \setminus x$ can produce y and $\bar{y} \geq y$ implies x can not produce $\bar{y} \}$ .....(1)

Where $\bar{y} \geq y$ means that $(\bar{y} - y) \in R_+^n$

A frontier $F(x)$ is then a correspondence from R_+^m to R_+^n Suppose we observe that a firm produces y^0 amount of output using $x^0 \equiv \left(x_1^0, x_1^0 \ldots\ldots\ldots\ldots x_n^0\right)$ levels of inputs. A firm may be said to be technically efficient if $y^0 = F(x^0)$ where $F(x)$ is the frontier function, and technically inefficient if $y^0 < F(x_0)$. A firm is said to be allocatively efficient if $\left[F_i(x_0) \Big/ F_j(x_0) = w_i \Big/ w_j \right]$ where $F_i = \delta F \Big/ \delta x_i$ the first order partial derivative of the function $F(x)$ with respect to the input x_i, and w_i and w_j are prices of the inputs x_i and x_j respectively, provided that the function F is differentiable. A firm is allocatively inefficient if $\left[F_i(x_0) \Big/ F_j(x_0) \neq w_i \Big/ w_j \right]$

The estimation of production frontiers has proceeded along two general paths: (i) deterministic frontiers – which forces all observations to be on or bellow the production frontier so that all deviations from the frontier are attributed to inefficiency; and (ii) stochastic frontier – where disturbance term consists of two components, one component representing technical inefficiency and the other representing the usual random noise. The advantage of the stochastic frontier over the deterministic frontier is that farm-specific efficiency and random error effect can be separated.

The key feature of the stochastic production frontier is that the disturbance term is composed of two parts – symmetric and one-sided. The symmetric component capture the random effects outside the control of the decision-maker including the statistical noise contained in every empirical relationship. The one-sided component captures deviations from the frontier due to inefficiency..

The original stochastic specification approach applied to cross section data. The error term was a composite variable, consisting of random noise and one-sided residual term (which follows half normal distribution). This approach has been extended in various ways, such as specification of more general distributions for the residual term (truncated normal, exponential and gamma), consideration of panel data and measurement of the technical efficiency using cost and profit functions[1]. Cornwell *et al.* (1990) estimated technical efficiency by using panel data. This methodology was applied among others, by Kumbhakar (1990), Kalirajan and Shand (1989), and Jha and Singh (1994). Battese and Coelli (1992) proposed a stochastic frontier production model, which has firm effects that are assumed to be distributed as truncated normal random variables and can vary systematically with time. A number of comprehensive

reviews of literature on the frontier production such as Fϕ rsund *et al.* (1980), Battese (1992), Schmidt (1986), Bauer (1990), Greene (1993), and Kalirajan and Shand (1999), are available in the literature.

For the purpose of the present analysis, the production frontier of the i-th firm, producing a single output with multiple inputs following the best practice techniques can be defined as,

$$Y_i^* = f\left(x_{i1}, x_{i2}, \ldots\ldots\ldots\ldots, x_{im}\right) \mid T \qquad \ldots\ldots (2)$$

where Y^* and x_is are the frontier output and inputs of the i-th firm, and T is the given technology that is common to all firms in the sample. If the i-th firm uses the best practice technique, but there are either statistical errors such as measurement errors or influence of external factors such as weather, then the firm's frontier function is calculated as

$$Y_i^* = f\left(x_{i1}, x_{i2}, \ldots\ldots\ldots\ldots, x_{im}\right)\exp\left(v_i\right) \qquad \ldots\ldots (3)$$

The presence of v_i here also means that the frontier is stochastic with a random disturbance v, implying that the frontier function may vary randomly across firms or over time for the same firm. Consider a situation in which the i-th firm is not producing its maximum possible output owing to some slackness in production induced by various non-price and socio-economic-organizational factors such as labour shirking. The production function of the i-th firm can be written in a modified neo-classical framework as follows:

$$Y_i^* = f\left(x_{i1}, x_{i2}, \ldots\ldots\ldots\ldots, x_{im}\right)\exp\left(v_i - u_i\right) \qquad \ldots\ldots (4)$$

where, u_i represents the combined effects of various non-price and organizational factors which constrain the firm form obtaining its maximum possible output Y_i^*. In other words, $\exp(u_i)$ which is firm-specific, reflect the i-th firm's ability to produce at its present level, which is otherwise called the i-th firms technical efficiency. The values taken by u depend on the real situation that the firm faces. Nevertheless, an upper limit can be set for the value of u. When there are no socio-economic and organizational constraints affecting the firm, u takes the value zero. When the firm faces constraints, u takes the value greater than zero. The actual value of u depends on the extent to which the firm is affected by the constraints.

One advantage of the above model is that it is possible to find out whether the deviation of a firm's actual output from its potential output is mainly because it did not use the best practice technique or is due to external random factors. Thus, one can say whether the difference between the actual output obtained and the potential frontier output, if any, occurred accidentally or not. If both the error terms are not distinguished in the estimation process, then OLS estimation can be carried out and it will give some sort of an average production function.

It is possible to estimate the stochastic frontier production function using the maximum-likelihood method[1]. Through maximum-likelihood estimator (MLE) approach, the source of the difference between the farmer's yield and that estimated by the frontier production was examined by calculating the variance

ratio parameter (γ).

Now, let σ_u^2 and σ_v^2 to be the variances of the parameters one sided (u) and symmetric (v). Therefore,

$$\sigma^2 = \sigma_u^2 + \sigma_v^2 \qquad \text{..... (5)}$$

and the ratio of the two standard error is

$$\lambda = \sigma_u / \sigma_v \qquad \text{..... (6)}$$

Then variance ratio parameter (γ), which related the variability of σ_u^2 to the total variability, σ^2 is

$$\gamma = \sigma_u^2 / \sigma^2 \qquad \text{..... (7)}$$

γ is defined as the total variation of output from frontier and can be attributed to technical efficiency. Hence, on the assumption that u_i and v_i are independent, the variance ratio from frontier (γ) has two important characteristics: (i) when σ_v tends to zero, then u is the predominant error in equation (4) and γ tends to one. This indicates the differences in the technical efficiency and (ii) when σ_u tends to zero, then the symmetric error is the predominant error in equation (4), so tends to zero.

Thus based on the value γ , it is possible to identify whether the differences between a firm's output and efficient output is principally due to statistical errors or firm's less efficient use of technology. The u_i and v_i parameters of the production frontier equation were estimated using maximum-likelihood method. Further, given a multiplicative production frontier for which, the Cobb-Douglas production frontier was specified, the technical efficiency of the individual firm was estimated by using expectations of u_i conditional on the random variable E_i .

$$TE_i = \exp(-u_i); \qquad 0 < TE_i > 1 \qquad \text{..... (8)}$$

Empirical Model

Various functional forms may be specified for the stochastic frontier production function, viz, Cobb-Douglas (C-D), Constant Elasticity of Substitution (CES), Translog, etc. However, the C-D functional form is generally preferred in most published papers on technical efficiency because of its well-known advantages. Indeed, its purpose is to show what output of a given product will be achieved by different combinations of factors. As for example, we generally find the difference in net value product per unit of land associated with a difference in the amount of labour used per unit of labour. This may happen when we move from one farm to another (Brown, 1957). In principle, confining the analysis to this functional form can be somewhat restrictive. However, studies done by Kopp and Smith (1980) and Krishna and Sahota (1991) suggest that functional specification had a very small impact on measuring technical efficiency. Therefore, the following stochastic frontier production function of the Cobb-Douglas type was specified to estimate the technical efficiencies for individual farms and crops.

$$InY_i = \alpha + \sum_{i=1}^{3} \beta_i Inx_i + v_i - u_i \qquad \text{..... (9)}$$

where, Y_i is the output of the i-th farm (in Rs.), K is constant term, $\beta_1, \beta_2, \ldots\ldots\ldots\beta_{10}$ are parameters to be estimated and $x_1, \ldots\ldots\ldots x_3$ are inputs labour (in Rs.), capital (in Rs.) and intermediate input (in Rs.), respectively. v_i is symmetric component of the error term and u_i is One-sided inefficiency component.

'u' takes the value of zero when the farmer is efficient and assumes the value greater than zero when the farmer is inefficient. Negative value of u varies depending on the level of inefficiency. The Maximum Likelihood Estimation (MLE) method enables us to obtain the maximum possible output function. It is assumed that u and v are independent and u follows a half normal distribution with variance σ_u^2 and v follows a normal distribution $N \sim (0, \sigma_v^2)$. The computer program FRONTIER 4.1 was used to estimate the frontier and firm-specific technical efficiencies.

4. Result and Discussion

4.1 Frontier Production Function

The Maximum Likelihood Estimates (MLE) of the frontier production function is shown in Table 1. We used labour, capital and intermediate input as input variables in the estimation of parameters. The empirical results obtained for different types of tenure are given in Column 2, 3 and 4 respectively in this table. From this table we observed that labour and intermediate input were positively significant for all the tenures. These positive and significant values indicate that there is scope for increasing production of paddy by increasing the level of these inputs. The explanatory variable capital had a positive influence on the production for owner operators but negative influence on the production for both tenants and mixed-holding. The regression coefficients in the Cobb-Douglas production function are the production elasticities and their sum ($\Sigma\beta_i$) indicates the return to scale. When ($\Sigma\beta_i$) = 1 there is constant returns to scale, when ($\Sigma\beta_i$) > 1 there is increasing returns to scale and When ($\Sigma\beta_i$) < 1 there is decreasing returns to scale. The sum of the regression coefficient is 0.525 for owner operators and 0.523 and 1.06 for tenants and mixed-holding respectively.

Table 1: Parameter Estimates of Stochastic Frontier Function

Variables	Owner Operator	Cash-Rent Tenant	Mixed Holding
(1)	(2)	(3)	(4)
Intercept	5.40 (7.58)*	5.24 (5.27)*	1.26 (1.23)
Labour	0.258 (3.24)*	0.308 (3.18)*	0.979 (5.88)*
Capital	0.072 (1.39)	-0.111 (-1)	-0.143 (-1.28)
Intermediate Input	0.195 (4.13)*	0.326 (1.65)**	0.221 (2.78)*
$\sum\beta_i$	0.525	0.523	1.06
Sigma Squared (σ^2)	0.055 (2.37)*	0.023 (1.89)**	0.029 (1.38)
σ_u^2	0.04	0.027	0.022
σ_v^2	0.015	0.002	0.001
$\lambda = \sigma_u / \sigma_v$	1.64	3.64	4.62
Gamma $(\gamma = \sigma_u^2 / \sigma^2)$	0.729	0.959	0.925
Log Likelihood Function	32.08	9.22	10.72
Sample Size	91	8	10

Note: Figure in parentheses are 't' values.

* Significant at 1 per cent level.

** Significant at 5 per cent level.

The estimated values of σ_u^2 is higher than the estimated values of σ_v^2 for all the tenures. The higher magnitude of σ_u^2 indicated that the difference between the realized output and the frontier output was more due to inefficiency use of resources at the disposal of the farmer. Here, 'λ' is the ratio of variance of the farm-specific production behaviour σ_u^2 to the variance of the statistical noise σ_v^2. The values of 'λ' for all the tenures indicating that one-sided error component had dominated relatively to symmetric error component.

The variance ratio 'λ' showed that firm specific variability contributed more to the variation in production among firms, which means that the total variation in output from the frontier is attributable to the technical efficiency. The estimate 'γ' which is the ratio of the variance of the firm specific performance of economic efficiency to total variance of output was 0.73 for owner operators, indicates the presence of significant inefficiency in the production of the paddy. In other words, about 73 per cent of the difference between the observed and the frontier output was mainly due to the inefficiency use of resources, which are under the control of the sample farmers. Similarly, in case of tenants and mixed-holding, about 96 per cent and 93 per cent respectively of the difference between the observed and the frontier output was mainly due to the inefficiency use of resources, which are under the control of the sample farmers.

4.2 Technical Efficiency

Table 2 shows the frequency distribution of estimated technical efficiency and Table 3 shows the summary statistics of the efficiency measures for the sample farmers. Technical efficiency of owner operators ranged between 66 and 96 per cent with an average of 85 percent. This analysis indicates that the output can be raised by 15 per cent by following efficient crop management practices without having to increase the level of application of input. In case of tenant-cultivated farms Technical efficiency ranged between 74 and 99 per cent with an average of 89 percent. This analysis indicates that the output can be raised by 11 per cent by following efficient crop management practices without having to increase the level of application of input. Technical efficiency of mixed-holding operators ranged between 72 and 96 per cent with an average of 87 percent. This analysis indicates that the output can be raised by 13 per cent by following efficient crop management practices without having to increase the level of application of input.

It was observed that in case of owner operators about 3 per cent of the farmers were harvesting less than 70 per cent and about 32 per cent were harvesting more than 90 per cent of the frontier output. It was also observed that most of the farmers (45 per cent) operated at the efficiency levels between 80-90 percent. Similarly in case of both tenant-cultivated farms and mixed-holding most of the farmers (50 and 60 per cent respectively) operated at the efficiency levels more than 90 percent. Mean technical efficiency ranged from 0.85 on owner operators to 0.89 on tenant-cultivated farms. In average tenant-cultivated farms are more efficient than the others.

Table 2: Technical Efficiency By Different Types Of Cultivated Farms

(households in per cent)

Levels of T.E (percent)	Owner Operator	Cash-Rent Tenant	Mixed Holding
< 70	3	-	-
70 – 80	20	12	30
80 – 90	45	38	10
> 90	32	50	60
Sample Size	91	8	10

Table 3: Summary Statistics of the Efficiency Measures

Variable	Owner Operator	Cash-Rent Tenant	Mixed Holding
Mean	0.85	0.89	0.87
Standard Error	0.01	0.03	0.03
Median	0.88	0.92	0.92
Standard Deviation	0.07	0.09	0.09
Skewness	-0.83	-0.58	-0.82
Minimum	0.66	0.74	0.72
Maximum	0.96	0.99	0.96
Sample Size	91	8	10

5. Conclusion

We have estimated farm-specific technical efficiency for different types of tenure in West Bengal agriculture using Stochastic Frontier Production Function approach. We have used the farm level cross section data collected by the Ministry of Agriculture, Government of West Bengal through the Cost of Cultivation Scheme. This study reveals that labour and intermediate input influence the output for all types of tenure. The average efficiency levels of paddy ranged from 85 per cent on owner operator to 89 per cent on tenant-cultivated farms. Thus, the analysis of technical efficiency indicates that there exists some scope to improve the productivity levels of paddy with the existing level of input use and the available technology in West Bengal agriculture.

References

Ball, V.E., C. Hallahan and R. Nehring (2004), "Convergence of Productivity: An Analysis of the Catch-up Hypothesis within the Panel of States", *American Journal of Agricultural Economics*, Vol. 86, pp. 1315-1321.

Banerjee A.V., P.J. Gertler and M. Ghatak (2002), "Empowerment and Efficiency: Tenancy Reform in West Bengal", *Journal of Political Economy*, 110(2).

Bardhan, P. and T.N. Srinivasan (1971), "Crop-sharing Tenancy in Agriculture: A Theoretical and Empirical Analysis", *American Economic Review*, 61(1), pp.48-64.

Battese, G. E. (1992), "Frontier Production Functions and Technical Efficiency: A Survey of Empirical Applications in Agricultural Economics", *Agricultural Economics*, Vol.7, pp. 185-208.

Battese, G. E. and T. J. Coelli (1992), "Frontier Production Functions, Technical Efficiency and Panel data: With Application to Paddy Farmers in India", *Journal of Productivity Analysis*, Vol.46, pp. 153-196.

Bauer, P. W. (1990a), "Recent Development in the Econometric Estimation of Frontiers", *Journal of Econometrics*, 46(1-2), pp. 39-36.

Bell, C. and P. Zusman (1976), "A Bargaining Theoretic Approach to Crop-sharing Contracts", *American Economic Review*, 66(4), pp.578-588.

Bhaumik, S. K. (1993), *Tenancy Relations and Agrarian Development: A Study of West Bengal*, Sage Publications, New Delhi.

Braverman, A. and J.E. Stiglitz (1982), "Sharecropping and the Interlinking of Agrarian Markets", *American Economic Review*, 72(4), pp.695-715.

Braverman, A. and T.N. Srinivasan (1981), "Credit and Sharecropping in Agrarian Society", *Journal of Development Economics*, 9(3), pp. 289-312.

Brown, Phelps E.H. (1957), "The Meaning of the Fitted Cobb-Douglas Function", *The Quarterly Journal of Economics*, Vol. 71, pp. 546-560.

Chattopadhyay, M. (1979), "Relative Efficiency of Owner and Tenant Cultivation: A Case Study",

Economic and Political Weekly, 14(39), pp.93-96.

Chattopadhyay, M. and A. Sengupta (2001), "Tenancy Inefficiency – A Study Based on West Bengal Agriculture", *Economic and Political Weekly*, Feb., pp.3-10.

Chattopadhyay, M. and D. Sarkar (1997), "A New Look at the Old Bottle: A Study on Land Tenure and Farm Productivity", *Indian Journal of Labour Economics*, 36(2), pp.201-207.

Cornwell, Schmidt and Sickles (1990), "Production Frontier with cross-sectional and time-series variation in efficiency levels", *Journal of Econometrics*, 46.

Dyer, G. (1998). "Farm Size and Productivity: A New Look at the Old Debate Revised", *Economic and Political Weekly*, Vol. 33, No. 26, June 27.

Farrell, M.J., (1957), "The Measurement of Productive Efficiency", *Journal of the Royal Statistical Society*, Series A, 120(3).

Fϕ rsund, F.R., C.A.K. Lovell, and Peter Schmidt (1980), "A Survey of Frontier Production Functions and Their Relationship to Efficiency Measurement", *Journal of Econometrics*, 13.

Greene, W.H. (1993), "The Econometric Approach to Efficiency Analysis", in H.O. Fried, C.P.K. Lovell and S.S. Schmidt (Eds.), *The Measurement of Productive Efficiency: Techniques and Applications*, Oxford University Press, pp.68-109.

Jha, R. and S. Singh (1994), "Inter-Temporal and Cross-Section Variation in Technical Efficiency in the Indian Railways", *International Journal of Transport Economics*, Vol. 21, pp. 57-73.

Kalirajan, K. P. and R.T. Shand (1989), "A Generalized Measure of Technical Efficiency", *Applied Economics*, Vol. 21, pp. 25-34.

Kalirajan, K. P. and R.T. Shand (1994), *Economics in Disequilibrium: An Approach from the Frontier*, Macmillan India Limited, New Delhi.

Kalirajan, K. P., M.M. Obwona and S. Zhao (1996), "A Decomposition of Total Factor Productivity Growth: The Case of Chinese Agricultural Growth Before and After Reforms", *American journal of Agricultural Economics*, Vol. 78, pp. 331-338.

Kalirajan, K.P. and R. T. Shand (1999), "Stochastic Frontier Production Function and Technical Efficiency Measurement: A Review" in K.P. Kalirajan and Y. Wu (Eds) (1999), *Productivity and Growth in Chinese Agriculture*, Macmillan Press, London.

Kopp, R.J. and V.K. Smith (1980), "Frontier Production Function Estimates for Steam Electric Generation: A Comparative Analysis", *Southern Economic Journal*, Vol. 46, No. 4 pp. 1049-1059.

Krishna, K.L. and Gian, S. Sahota (1991), "Technical Efficiency in Bangladesh Manufacturing Industries", *Bangladesh Development Studies*, 19(1-2) pp. 89-105.

Kumbhakar, S.C. (1990), "Production Frontier, Panel Data and Time-Varying Technical Inefficiency", *Journal of Econometrics*, Vol. 46, pp. 201-211.

Schmidt, P. (1986), "Frontier Production Functions", *Econometric Reviews*, 4(2), pp.289-328.