ECONOMIC DIMENSIONS OF AMBEDKAR'S WORK*

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A number of Indian economic historians and economists have made significant contributions in economic history of India and have focused on the history of economic thought. But their writings failed to include thoughts and ideas of all those Indian scholars whose contributions went a long way to explain the socio-economic milieu of their times and influenced the decision-making and offered alternative solutions to the problems facing the nation. One such unfortunate omission was Dr. B. R. Ambedkar's contributions to economic thought, particularly in the area of public finance and money and currency, which were acclaimed as pioneering ones by many economists and policy-makers of his time. In this paper an attempt is made to focus on these contributions of Ambedkar and establish his identity as an economist.

PRELUDE

We study our past mainly to know the present properly and to prepare for a better future. The study of history of economic thought and theory, which is an important component of the subject economics, serves the same purpose. The volume of literary work in the area is no doubt much less in quantity than that in other branches of economics but that does not minimize the importance or reduce the relevance of the subject. Rather in pursuit of alternative growth and developmental strategies, its importance is increasingly felt now a days.

The economic thought which remotely controlled the nature and trend of the economic activities of a country often went unnoticed. In India since ancient period this aspect did not receive the attention of the scholars as much as it needed to yield meaningful results so as to offer a clear guidance for the future course of action.

The great Indian historians and economists like Dadabhai Naoroji, Justice Ranade, R.C. Mazumder, Jadunath Sarkar, B.N. Ganguli and several others have made significant contributions in economic history of India while only a few, notably B.N. Ganguli, Ajit Dasgupta and Bhabatosh Dutta, focused on the history of Indian economic thought. Their attempts though praiseworthy are not comprehensive enough

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to include thoughts and ideas of all those Indian scholars whose contributions went a long way to explain the socio-economic milieu of their times and influenced the decision making and offered alternative solutions to the problem facing the nation.

One such unfortunate omission is found in the conspicuous absence of Dr. Bhimrao Ramji Ambedkar's economic thoughts and ideas in all the aforesaid celebrated works of eminent Indian economic historians. This aspect might have escaped their notice because of Dr. Ambedkar's fame as the Chairman of the Drafting Committee of the Constitution of India and as a leader of the backward and down trodden sections of Indian Society. However, this may be a genuine excuse for an ordinary man but surely not an alibi for any serious researcher in the area of Indian economic thought.

OBJECTIVE

This paper aims at pointing out the different dimensions of Ambedkar's identity as an economist. Before addressing this problem it should be made clear at the outset that to evaluate the work of any economist, two aspects of the work should be given importance. One aspect relates to the theoretical or analytical side and the other to the applied or policy formulation side. Economics being basically a branch of social science and particularly an applied science is obviously different from pure and physical sciences.

ECONOMICS VIS-À-VIS PHYSICAL SCIENCES

The fundamental difference between social or economic sciences and physical sciences lies in the subject matter that they deal with. The "difference that we would here emphasize is one of kind which arises from the fact that the propositions of economic science do not satisfy what one might call the universality criterion. The reality which the physical science are concerned with is supported to be given and constant. The assumptions that a scientist makes concerning the occurrence of physical phenomenon are valid universally not only with respect to place but also with respect to time. The apple falls on the ground at all places and has done so, one imagines, all times"[6]. But social scientists or economists "deal with a universe when data are freakish and are not valid universally, and when phenomenon emerges that are not only not known before but also had not existed before. It is of the nature of economic science that it involves events and phenomena which not only changes complexion from time to time but do not also occur at all places"[6]. As a result, the theories developed to explain a phenomenon which is economic in nature at a place at one point of time may be irrelevant in other place or in the same place at a different point of time.

This point will become amply clear if we take the two situations, one in mid-eighteenth century and the other, a little before mid-twentieth century. In the former situation the basic concern of a nation was to ensure growth with stability when the secret of success lay in the production of wealth without caring for anything else as supply creates its own demand. This is known as the famous Say's Law, which was valid for quite sometime. But the society outgrew this situation due to its inherent dynamism giving rise to a situation, which we come across in the mid-twentieth century, to be more specific during 1930s. In this situation the Say's Law did not work. The new theory propagated by John Maynard Keynes known as the theory of 'Effective Demand', which postulates completely opposite proposition, that is, demand creates its supply, proved to be very effective; and policies started being formulated on the basis of this theory. Now, does this mean that the Say's Law was wrong and Keynes' theory was right. The answer is a definite 'No'. What can be said in this connection is that the Say's Law was relevant and valid during his time and Keynes' theory was relevant in the mid-twentieth century, in altogether different circumstances.

HOW TO APPRECIATE AMBEDKAR?

To appreciate and evaluate the works of Ambedkar this perspective must be kept in view, in the sense how appropriate is his analysis for the socio economic situation in his time and how useful was his perception for formulating policies to amulet socio-economic evil.

Ambedkar's time horizon starts from last decade of nineteenth century and extends up to a little over mid-twentieth century. This time horizon has been chosen to cover his life span. Evidently he was born in British India and died in independent India. That he was born in an untouchable 'Mahar' family in Satara district of Maharastra helped him to have a clear view of the social structure of India looking at it from the lowest stratum of the society. The other opportunity that he had, educating himself in various subjects in social sciences and law, here in India and abroad, helped him to understand the contemporary socio-economic issues that emanated from a hierarchical, social structure under exploitative foreign domination. His analysis of the social order, nature of exploitation and deprivation in traditional social system, the nature of imperial rule and the crisis of governance, was not only valid but the remedial measures that he suggested were appropriate in his time and also very relevant even today. Inefficient implementation of those measures could not produce the result that they could, neither in his time nor thereafter.

ECONOMICS OF COMPANY RULE

His analytical faculty and pragmatic approach could be understood for the first time in his brief, forty two pages long research paper entitled 'Administration and Finance of the East India Company' submitted in Columbia University as dissertation for M.A. degree in the year 1915. This dissertation offers a historical account of the administration and finance of the East India Company by the British Government and side-by-side brought out the economic and legal implications of the same, all of which ran adverse to the interest of Indians. East India Company having a toehold on Indian territory for trading activity, at the initial stage, established its hegemony all over the country, in course of time. Ultimately Company government was installed to carry on its administrative and commercial activities under the supervision of the British Government.

A two-tier system consisting of the Court of Directors and the Board of Commissioners for the Affairs of India (The Board of Control) was vested with the responsibility of administering the country. The Court of Directors composed of twenty-four members, elected from the qualified proprietors who were the shareholders of the Company, and the Board of Commissioners (or The Board of Control) was a nominated body of the British Government. The Board of Control, which was presided over by a Minister, supervised the actions of the Court and thus the British Government excised the control over the Company.

From 1792 till its abolition and take-over by the British Government in 1858, some changes in the nature of work and responsibility of the Company were introduced, gradually reducing it to cipher. This process started by compelling the company to keep separate account of finance and commerce by an act of British Parliament in 1815. Earlier, East India Company, being responsible for administration and commerce used to merge together the revenue returns from administration and commerce.

The East India Company enjoyed the privilege of monopoly of the Indian trade that becomes a point of grudge of the British people. As a result, "the British were determined to derive as large a gain as possible for allowing her that privilege. Every weakness in the administration was made an excuse for extortion and interference; and renewal of charter was often an occasion to disgorge her (East India Company) or her wealth accumulated by the monopoly of Indian trade". "The East India Company in spite of the fact that she was a source of great prosperity to England suffered great humiliation at the herds of the British Parliament and people"[7].

The Company could continue her monopoly till 1833 winning over the English statesmen, by fair means or foul, but lately the cry was so loud against the

monopoly that the East India trade was to be thrown open to the British people and by the act of 1834 the Company was to be denied commercial operation, though "she continued her existence as a political sovereign of her territories in India"[7]. But the political support that the company started loosing reached the critical stage when Lord Palmerston, returning by a strong majority in 1857 as a result of his success in the Crimean War, notified the directors of the Company a bill for abolition of the Company and for resumption of direct government of India by the Crown. However, in 1858 a bill, designated as an "Act for better government of India"[7], was passed and India came under direct control of British Government.

The popular misgiving about this take-over was that the inefficiency of the Company went to such an extent that it resulted in the so-called "Mutiny" in 1857. But Ambedkar removed this misgiving in his dissertation by putting the relevant facts in right sequence. "It is an error", said Ambedkar "to suppose that the East India Company was abolished because of her inefficiency as manifested in the Mutiny of 1857", though, "the Mutiny did occur in 1857 and gave a strong impetus to the abolition movement already in full swing"[7].

EXTORTION PROCESS OF THE COMPANY

Apart from removal of this misgiving Ambedkar very clearly bought out how East India Company extorted money from India by paying dividends to the British shareholders, which were not justifiable on the basis of the profits that the Company earned. Ambedkar made a detail statistical analysis of the government revenue collection during the period 1792-93 upto 1885-86 and showed how revenue was forced out by way of land-tax, salt-tax, opium-duties, custom-duties and other miscellaneous duties. He received support from eminent historian R.C. Dutt in asserting that the land tax levied by British Government was not only excessive but was fluctuating and uncertain in many provinces which was, as a matter of fact, more strenuous. The analysis of the data during the period of 1800 to 1857 revealed that military charges alone claimed as much as forty-five percent to sixty-four percent of the total Company Government expenditure, which did not have any parallel comparison at that time.

Another important finding of Ambedkar's study of East India Company was indeed revealing which makes him score above R. C. Dutt's analytical faculty. It is regarding the heavy tribute that India had to pay regularly to Britain by way of "home charges" which was entirely the creation of war. According to the act of 1858 which goes by the name "Act for better government of India" 'the revenues of India shall not, without the previous consent of both Houses of parliament be applicable

to defray the expenses of any military operations carried on beyond the external frontiers of such possessions by her Majesty's forces charged upon such revenues'. This provision of the act was used by many scholars in India including R. C. Dutt to justify this heavy tribute by India as salutary financial provision. The basic drawback of this justification, according to Ambedkar, lies on two basic points: (i) the revenues of India 'have been spent outside India for non-Indian purpose, even after the Act' and (ii) 'the fatal error lay in this, - the excepting clause.....omits the vital word *previous*'[7]. To have any salutary impact previous consent of the Parliament is a necessary requirement. This escaped the notice of everybody. This work of Ambedkar not only established his identity as a brilliant analytical economic historian but as a bold patriotic Indian as well.

BRITISH RULE: THE Ph.D. THESIS

The other work on economics was entitled the provincial finance in British India, which was his Ph.D. thesis in Columbia University U.S.A. in 1917, and was published in book form in 1925. It was considered to be a basic contribution to the theory of public finance. To be more specific, it dealt with center–state financial relationship in British India covering the period 1833 to 1921. As a matter of fact this period starts from the year the Company ceased to be a commercial corporation. The two works taken together covers almost the entire foreign rule in India-68 years by the East India Company starting from 1792 right up to 1858 and 89 years British Government rule from 1858 to 1947. This probing analysis was highly acclaimed all over the world. Professor Dr. Edwin Robert Anderson Seligman, the then Professor of Political Economy, Columbia University, New Work, an authority on the subject and editor-in-chief of Encyclopedia of Social Sciences and one of the members of American Economic Association, commented that "The value of Mr. Ambedkar's contribution to this discussion lies in the objective recitation of the facts and the impartial analysis of the interesting development that has taken place in his native country. The lessons are applicable to the other countries as well; nowhere, to my knowledge, has such a detail study of underlying principles been made"[7].

FEDERAL FINANCE: A CONTRIBUTION

The analysis and the inquiry into the causes of financial malady of British India and the suggestions of sharing the financial responsibility both by the center and provinces were really commendable. A parallel attempt was made by Justice Ranade in a booklet, which was published in 1887 covering the financial analysis of British India only up to 1882 and, according to Ambedkar, this work suffered from some basic drawbacks. Apart from the international recognition of Ambedkar's thesis

at that time his ideas even today go a long way in determining the federal structure that has been adopted by different nations including India. It may be mentioned here that the Finance Commission, which is appointed for five years as per the constitutional provision is the result of Ambedkar's thesis. This, in a sense, is considered a permanent solution to the complicated issue that was associated with the centre-state relationship. This is, no doubt, a significant contribution to the theory of public finance and more specifically to the theory of federal finance.

CURRENCY AND EXCHANGE: THE D.Sc. DISSERTATION

A significant contribution made by Ambedkar could be found in his celebrated book entitled 'The Problem of the Rupee: Its origin and Its Solution', published in the year 1923. Before publication of this book, London School of Economics awarded him D.Sc. degree in Economics in the year 1921. The second edition of the book was published in the year 1947. This book bears testimony to the fact that he was an authority in the area of economic policy and currency problems. In this book he analyzed very meticulously the problem of Indian currency from 1800 to 1920 and suggested a currency system for India, which he considered to be appropriate. In so doing he sharply differed with the idea of John Maynard Keynes. Ambedkar advocated gold-standard and Keynes prescribed gold-exchange-standard in his treatise entitled 'Indian Currency and Finance' published in the year 1909. Ambedkar argued in favour of gold-standard because in this system the supply of currency cannot be so easily made and as such it better insures greater stability of prices and hence poorer section of the society will get greater protection. Though Ambedkar's suggestion was not taken up by the Imperial Government, the intention of Ambedkar of protecting the interest of the poorer section of the society could not be undermined. Ambedkar submitted an interesting evidence to the Royal Commission on Indian Currency and Finance and he appeared before the Commission on 5th December 1925 for examination. The significant contribution of this evidence might have gone long way to the establishment of the Reserve Bank of India. However, Ambedkar had an intention of revising the book (The Problem of the Rupee), and brings out two volumes, which he could not do because, according to him, he left economics and joined politics full time. He intended to make the Problem of the Rupee the first volume of the series and make a second volume, which would contain the History of Indian Currency and Banking from 1923 onwards.

ECONOMIC PERCEPTIONS IN AMBEDKAR'S POLITICAL CAREER

Though Ambedkar, by his own admission, could not bring out even a second edition of the book (The problem of the Rupee) for the reason that his change over

from economics to politics left him no time to undertake such a task, his idea of economics actually permeated through his programmes of action in the fields of politics and social change. As a matter of fact, his identity as an economist did not get diluted in the diverse activities he was engaged with through-out the rest of his life.

Ambedkar knew that Indian economy was predominantly an agricultural economy and eighty percent of India's population lived in villages and agriculture was their main occupation. They were not economically well-off and to improve their economic condition would bring about economic regeneration of rural India, in other words, eradication of rural poverty. This perception did not remain at the level of his understanding alone. He acted on the basis of this and to translate it into reality he organized mass movement and scored a reasonable degree of success. The abolition of "Khoti" system (1949) 'Mahar Vatan', (1959) and introduction of The Bombay Money Lenders' Bill (1938) stands out distinct as the success stories of his movement. In some parts of Konkan region of Maharastra 'Khots' (like Zaminders) had rights to land, which were cultivated by farmers from whom the Khots used to collect revenue, a part of which used to be shared with the government. This system of land tenure was called the Khoti system. This system subjected the vast majority of the rural farmers and their family to perpetual oppression and exploitation.

Ambedkar initiated a movement against this system on April 14, 1929 in an Agricultural Conference in Chiplun of Ratnagiri District. In 1936, he founded independent labor party and in its manifesto a high priority was given to the abolition and exploitation of the rural poor by 'Khoti' system. In the year 1937, on September 17, the historic bill for abolition of the 'Khoti system was introduced by Ambedkar in Bombay Legislative Council. After a long struggle and turmoil the 'Khoti' system was abolished in the year 1949.

'Mahar Vatan' system was an outcome of The Bombay Hereditary Offices Act (1874), which was used to exploit rural poor belonging to 'Mahar' caste. 'Mahars' used to hold very low-level government jobs, mostly odd jobs of all government departments round the clock. Practically, these 'Mahars' along with their family members were at beck and call of the government officers for twenty-four hours without any defined tasks. The range of their works included removal of carcass to running with the 'tonga' of the government officers throughout their journey. In return 'Mahars' were given a piece of land called 'Vatan' to be cultivated by them and a part of produce of which was to be passed on to the government as 'Baluta'. Sometimes, a paltry sum of money also used to be given by the way of wage. This remuneration was not regular and the government officers used to increase or decrease the amount of money and the piece of land absolutely arbitrarily. This inhuman

exploitation was perpetrated by giving them an ego-boosting description like 'Vatandars', which implied performance of the assigned duties.

Ambedkar started a movement against this in 1927 by publishing series of articles on 'Mahar Vatan' in 'Bahiskrit Bharat' – a weekly, which was edited by him and by organizing meetings and conferences to educate the people who were subjected to this exploitation. In the next year (1928) Ambedkar introduced a bill in Bombay Legislative Assembly to amend The Bombay Hereditary Officers' Bill in which he pointed out that the 'Vatan' land was given to 'Mahars' by emperor of India long back and the government did not increase the land nor the remuneration to those people though the government servants are compensated for higher standard for living. He proposed that the 'Vatan' land should be given to present holders without any service obligation. This bill initiated a prolonged struggle and after about thirty-one years the 'Mahar Vatan' was finally abolished under the 'Bombay Inferior Village Vatans Abolition Act 1' of 1959.

In the year 1938, The Bombay Money-Lenders' Bill, prepared by Ambedkar, was inspired by the realization of the fact that the industrial workers were exploited by money lenders. To check the Malpractices of money lenders some very effective measures were introduced which are relevant even today. This was for the first time that the money-lenders were obliged to renew their licenses every year and to keep written records of lending operations. The issue of passbooks having details of transaction between lenders and borrowers was made mandatory. However, all these activities were remotely controlled by his perception of socio-economic milieu during his time and the viable solution that emanated out of an implied model of economic development which is needed to be a retrieved not only in pedagogic interest but for policy options that are still being looked for.

DEVELOPMENT ECONOMICS: AMEDKAR'S SOCIO-ECONOMIC PERSPECTIVE

As an economist Ambedkar was perfectly aware of the two aspects of an economy, they are, according to economic parlance, growth and development. Growth of an economy, Ambedkar knew, could be ensured by the higher productivity of the labour class, given the natural resources. To make the labour productive the fair share of the labour should be ensured by adopting appropriate machinery to negotiate the share of the labour on behalf of the working class. As a machinery, Ambedkar realized the importance of the labour unions or trade unions. Ambedkar lost faith in the communist dominated labour unions and established a separate union with the

name 'Independent Labour Party' and he himself drafted the manifesto of this party. This manifesto itself is not only suggestive of his professional excellence as an economist but a document to be followed as a guideline for developmental and poverty alleviation policy relevant even today. As a Labour Member of Viceroy's Executive Council from 1942 to 1946, he introduced a number of welfare measures for the working class of India. Notable among them are establishment of employment exchange, machinery for fixation of minimum remuneration, tripartite dispute settlement mechanism, fixation of working hours, working condition, leave with pay etc., which, even today, offers a safety net to the labourers.

The labour welfare measures, just pointed out, take care of not only the productivity of labour, but also the insurance of the claim of legitimate share of the labour in the total production or income of the industry. In a sense, it takes care of growth and development as well. Higher productivity of labour means the growth of income and legitimate share of the labour means more equitable distribution of income and less inequality of distribution, which in turns means development. These welfare measures are largely applicable in case of industrial labour and not in case of agricultural labour or the rural poor.

Earlier in this discussion I mentioned the two movements organized by him to abolish (1) 'Khoti System' and (2) the 'Mahar Vatan' system that mainly benefited the rural poor in agricultural sector. But there is another social ailment that India still suffers from is caste system of which Ambedkar himself was a victim. He, therefore, knew very well how harmful it was for the overall development of a nation. This menace does much greater harm to rural India, which is largely an agricultural economy.

STATE SOCIALISM : A DREAM

India being a pluralistic society having a population with diverse religion, language, culture and ethnicity is faced with the problem of integration. In addition to that, the caste-divided Hindu society traditionally creates a problem of all-pervading in nature having a serious impact on the socio-economic fabric of the nation, particularly because the Hindus constitute the majority of population. The majority of those who were engaged in agriculture and primary producing sector belong to the lowest structure of the hierarchical Hindu society. Most of them belong to the untouchable section of the society. During Ambedkar's time this division was most stringent and the exploitation of lower castes by upper caste or caste Hindus was not only socially disintegrating but economically counter-productive. Some pedagogic

explanation of this hierarchical Hindu society is sought in the equivalence between social strata and occupational or professional identity. But this explanation hardly stands the test of the ground reality. The occupational mobility did never synchronize with social mobility. According to Ambedkar, this social menace can only be removed if the caste system is annihilated or eliminated from Hindu society, which again is a very difficult task. In such a situation, Ambedkar thought that the fate of the large majority of lower caste Hindus is not at all safe so far as their economic destiny and social position were concerned. This apprehension gets strongly grounded when one finds vested interest is fortified by caste hierarchy. In other words, if class division coincides with caste division, no moral suasion in favour of social justice becomes effective. The age-old practice that insulated the hierarchal social order could, according to Ambedkar, be changed by constitutional measures. He, therefore, advocated the provision of reservation for schedule caste and tribes to place them in the position of social dignity and equal economic and political opportunity. Now-a-days similar measure is being advocated in case of empowerment of women in India by providing adequate reservation for them. This indirectly validates Ambedkar's remedial measures.

This remedial measure to eliminate social and economic inequality is solely constitutional in nature. These constitutional measures were recommended to a democratic country like India. This in turn makes it clear that the developmental strategy that he had in mind did not completely surrender to a market economy; rather, in a sense, combined both. In that combination the role of the state assumes larger proportion.

This point becomes amply clear when he suggested in his very significant contribution entitled 'States and Minorities' (1947), that real democracy can not be established just by one man-one vote; what is necessary is 'one vote-one value'; which can only be ensured, according to Ambedkar, if the means of production are owned by the State. Such a system could be insured by the constitution of a country, which, in other words, means 'State Socialism'. Ambedkar wanted to do that.

CONCLUSION

At the end of this brief discussion, what transpires as various economic dimensions of Ambedkar's combinations is that he was a specialist in Public Finance of world repute, an expert in money and currency, an economic historian of eminence and a development economist whose ideas, even today, offer viable alternative solution to the present crisis of India.

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THE LEONTIEF - GHOSH DUALITY RE-EXAMINED IN THE LIGHT OF THE SRI LANKAN ECONOMY

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Due to its General Equilibrium character, the extended Leontief Input-Output Structure represents the entire anatomy of the production and allocation system of an economy. When we look at the entire canvas of interrelationships, it matters little whether we move from the Final Use to the Value Additions or from the Allocations to the Final Demands, provided that the distribution of Value Additions and Final Usages remains unchanged. This is the economic reason behind the identity between the Weighted Output Multipliers and the Weighted Allocation Multipliers. Duality is about two reflections of the same basic structure so that these reflections mirror one another.

The quantitative applications are based on the Sri Lankan Input-Output Table for 1994. Besides providing an empirical verification of the duality between the Leontief (1941) and Ghosh (1958) Models which are combined in the Extended Structure, the results indicate that the Sri Lankan Economy has weak sectoral interconnectedness and that the key sectors are predominantly Primary and Service sectors. Hence, there is a case for the development of strong intersectoral linkages in the Sri Lankan Economy.

INTRODUCTION

The Extended Input-Output Model is often used to measure the degree of interconnectedness of different sectors of an economy. Two such important measures are the Output Multipliers and the Allocation Multipliers, originating from the Leontief (1941) and Ghoshian (1958) components of the Extended Structure. This paper attempts to re-affirm the duality between the Ghosh and Leontief Models as proposed by Dietzenbacher (1997). It also tries to look into the Duality Proposition and to provide an economic logic for explaining the algebraic identity between the Weighted Allocation Multipliers and the Weighted Output Multipliers.

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I

ANALYTICAL FRAMEWORK

1.1 The Extended Input-Output Model

Input–Output Methodology is a representation of General Equilibrium. The basic premise is that the various sectors of an economy are interconnected in a non-hierarchical way. The degree of interconnectedness, however, varies from one economy to another. Multiplier Analysis is one way of studying this degree of interconnectedness.

The Extended Input-Output Model may be used for this purpose. It accommodates both the Demand -Driven Leontief Model and the Supply-Driven Ghosh Model. This Structure is given below.

X	f	x
v'	-	$v'e$
x'	$e'f$	

THE EXTENDED INPUT-OUTPUT STRUCTURE

Here, X $\Rightarrow$ The Inter – Industry Tranasctions Matrix

x $\Rightarrow$ Column Vector of Gross Outputs

f $\Rightarrow$ Column Vector of Final Demands

v' $\Rightarrow$ Row Vector of Value Additions or Primary Allocations

e' $\Rightarrow$ Unit Row Vector.

The entities in the above structure are all expressed in Money-Value terms.

Solutions to the Model are given by

i) Leontief Solution $x = (I-A)^{-1} f$ where $\{A\}$ is the matrix of Input-Output Coefficients whose the (ij)-th element gives the value of input from the i-th sector required to produce the gross output of the j-th sector at the unit level. Hence, $\{A\} = X \langle x \rangle^{-1}$ where $\langle x \rangle^{-1}$ is the inverse of the diagonalised matrix of gross outputs.

For this solution we use the balancing equation $x = Xe + f$.

ii) Ghoshian Solution $x' = v' (I-B)^{-1}$ where $\{B\}$ is the Supply Coefficient matrix whose the (ij)-th element gives the proportion of the value of gross output of the i-th sector supplied to the j-th sector through inter-industry transactions. Hence, we have $\{B\} = \langle x \rangle^{-1} X$.

For this solution we use the balancing equation $x' = e'X + v'$.

The measures of interconnectedness are based on the Leontief Inverse Matrix $(I-A)^{-1}$ and the Ghosh Inverse Matrix $(I-B)^{-1}$.

1.2 Some Important Measures of Interconnectedness

i) **Output Multipliers $(I-A)^{-1}$ e.** The i-th row-sum of $(I-A)^{-1}$ measures the effect of simultaneous unit changes in each of the components of final demand on the gross output of the i-th sector.

ii) **Allocation Multipliers $e'(I-B)^{-1}$.** The j-th column-sum of $(I-B)^{-1}$ measures the effect of simultaneous unit changes in allocations of primary inputs to each sector on the gross output of the j-th sector.

iii) **Weighted Output Multiplers $(I-A)^{-1}$ h .** Here the unit column vector of the Output Multiplier is replaced by $h [= f(e'f)^{-1}]$, which is the vector of percentage components of final demand. It serves as the weightage vector.

iv) **Weighted Allocation Multipliers $g'(I-B)^{-1}$.** It uses $g' [= v' (v' e)^{-1}]$, the row-vector of percentage components of primary allocations as the basis for giving suitable weightage to the allocation Multipliers.

Algebraically the Weighted Output Multipliers and the Weighted Allocation Multipliers must be identical transposes of one another, but we would like to explore the Ghosh-Leontief Duality to obtain an intuitive-economic understanding that goes beyond the mechanistic explanation.

1.3 The Duality between Leontief and Ghosh Models

In order to clarify the use of notations that will follow, we elaborate on the them :

i) The Gross Output Vector x in value terms may be expressed as {<p><q>e} where <p> and <q> are the diagonalised matrices of prices and output quantities of various sectors.

ii) The Leontief Inverse Matrix $(I-A)^{-1}$ in value terms can be expressed as <p> $(I-a)^{-1}$<p> $^{-1}$, where {a} is the matrix of Physical I/O Coefficients.

iii) The value addition or primary allocation row vector v' in money value terms can be expressed as $w' < \hat{v} >$ where w' is the row vector of primary input

prices and $< v' >$ is the diagonalised matrix of primary input quantities allocated to the various sectors.

iv) The diagonal matrix of physical primary input coefficients is given as <?> which is equivalent to $< v' > < q >^{-1}$.

v) The final demand vector f in value terms is equivalent to <p>d , where d stands for vector of final demand quantities.

vi) It may be noted that all diagonal matrices are expressed as <.>.

We now turn to a re-examination of the Ghosh-Leontief Duality.
From the Ghoshian Solution given by equation (ii) of sub-section 1.1 above, we see that

$x' = v' (I-B)^{-1} \Rightarrow e' <x> = v' [<x>^{-1} (I-A) <x>]^{-1}$,
since $B = <x>^{-1} \{A\} <x>$
Hence, we obtain :

$$e' = v' <x>^{-1} (I-A)^{-1}$$
$$e' = w' <\hat{v}> <x>^{-1} (I-A)^{-1}$$

These are the solutions to the Leontief Price Accounting System showing that every rupee worth of gross output of a sector is formed by the summation of money-values of intermediate inputs and primary inputs that are used to produce it :

$$e' = e' A + w' <\hat{v}> <x>^{-1} ,$$

the gross output of each sector being traced vertically along each column-length of the Extended Input-Output Structure.

The same solutions are directly observable from the Leontief Price Equations which are :

$$p' = p' a + w' < y > \Rightarrow p' = w' < y > (I-a)^{-1} \text{ ..... The}$$

Leontief Price Solution

$$\Rightarrow \quad e' <p> = w' < y > <p>^{-1} (I-A)^{-1} <p>$$
$$\Rightarrow \quad e' = w' < y > < p >^{-1} (I-A)^{-1}$$

$$\text{where } < y > < p >^{-1} = <\hat{v}> <x>^{-1}$$

In brief, the Ghoshian Solution in Money-Value terms may be interpreted as the Leontief Price Accounting Solution, which is the solution to the dual of the Leontief Quantity System .

Again, from the Leontief Solution in Money-Value terms, we may obtain the solutions to the Ghoshian Quantity Accounting System, as shown below.

$$x = (I-A)^{-1} f \Rightarrow \langle x\rangle^{-1} x = \langle x\rangle^{-1} [\langle x\rangle(I-B)\langle x\rangle^{-1}]^{-1} f$$

$$\Rightarrow \quad \mathbf{e = (I-B)^{-1} \langle x\rangle^{-1} f}$$

$$\Rightarrow \quad \mathbf{e = (I-B)^{-1} \langle x\rangle^{-1} \langle d\rangle p}$$

These are the Solutions to the Ghoshian Quantity Accounting System which show that each rupee worth of gross output of any sector is disposed of as intermediate allocations and as final demands :

$$\mathbf{e = Be + \langle x\rangle^{-1} f} \ ,$$

the gross sectoral outputs now being traced horizontally across each row of the extended Input-output Structure.

The same results can be obtained directly by looking at the Structure in terms of allocations . From equation (i) of sub-section 1.1 above we get

$$x = Xe + f \Rightarrow \mathbf{\langle x\rangle^{-1} x = \langle x\rangle^{-1} Xe + \langle x\rangle^{-1} f}$$

$$\Rightarrow \mathbf{e = Be + \langle x\rangle^{-1} f}$$

To summarise our results so far, we note that the Ghosh Model and the Leontief Model, when expressed in Money-Value terms, are self-duals (Dietzenbacher, 1997).

Given the Ghosh – Leontief Duality, we now propose an economic explanation for the identity between the Weighted Versions of the Output and Allocation Multipliers. The causal directions implied by the simple output and allocation multipliers are reverse to each other. But when we consider the entire system in the Extended Input-Output Structure, the underlying production and allocation structures are but reflections of the same unified pattern of interrelationships between the various sectors. It does not matter whether we consider the initial stimulus to be on the Final Usage and trace out the effects on Value-Additions or start from the reverse direction and move from initial impacts on Primary Allocations to the net effect on Final Demands, provided that the distribution of Final Demands and

Primary Allocations do not change. These results are built into the Extended Structure because of the Accounting Relationships that the Extended Model embodies. **Hence the Identity between the Value-Added Structure of Final –Usage Matrix and the Final –Allocation Structure of Value-Added Matrix (Adamou & Gowdy, 1990), shown by :** $\langle v\rangle\langle x\rangle^{-1}(I-A)^{-1}\langle h\rangle \leftarrow = \rightarrow \langle g\rangle (I-B)^{-1}\langle f\rangle\langle x\rangle^{-1}$ **, where the arrows indicate the causal directions.**

From the discussions above, we can attribute the identity between the weighted versions of the Output and Allocation Multipliers to the Ghosh-Leontief Duality. Accordingly, the name "COMBINED MULTIPLIERS" may be used to describe the Weighted Output (Weighted Allocation) Multipliers obtained from the Extended Input-Output Structure.

II
APPLICATIONS ON THE SRI LANKAN ECONOMY

2.1 What led to the choice of Sri Lanka

Since the Second World War, there has been an increasing urge to find ways and means of ushering in rapid economic development in the Third World Countries. Sri Lanka is one such country.Today, in the context of economic co-operation in South Asia, it is all the more crucial that we understand the intersectoral links within the countries of this region, one among which is Sri Lanka.

The study of intersectoral connections within an economy is vital because a well-interconnected structure is a necessary pre-condition for the proper transmission of the effects of economic policies for development throughout the economy. It also helps to identify the key sectors of the economy and thereby project its developmental potential.

2.2 Data Base.

The Sri Lankan Input-Output Table has been sourced from the Department of National Planning, Sri Lanka (2000). Our Results are based on a 40x40 Aggregated Matrix.

2.3 Measuring the degree of Interconnectedness

Following Matallah and Proops (1992), the Multipliers have been classified into three categories – Strong, Medium and Weak . Let t(i) be the i-th row sum of

$(I-A)^{-1}$ and k(j) be the j-th column sum of $(I-B)^{-1}$.The basis for classification is :

a) **STRONG :** $t(i)/\{t(i)/n\} \geq 1$ **implies that** $t(i)/\{t(i)\} \geq 1/n = 1/40 = 0.025$

b) **MEDIUM :** $0.9 \leq t(i)/\{t(i)/n\} < 1$ **implies** $0.9/n = 0.0225 \leq t(i)/\{t(i)\} < 1/n = 0.025$

c) **WEAK** : $t(i)/\{t(i)\} < 0.9/n = 0.0225$

Similarly, for Allocation Multipliers we may develop the same classification scheme based on $k(j)/\{k(j)\}$.

2.4 Results of Multiplier Analysis and Measurment of Degree of Interconnectedness

(i) Output Multipliers

Only eleven out of forty sectors show strong Output Multipliers. They are arranged in descending order of strength in Table 1 below:

TABLE 1. SECTORS WITH STRONG OUTPUT MULTIPLIERS

SECTOR NAME	VALUE OF MULTIPLIER		RANK
	ABSOLUTE	STRENGTH	
Trade and Transport	8.2794	0.1317	1
Banking and Insurance	2.9629	0.047	2
Rubber	2.1871	0.0348	3
Chemical and Chemical Products	2.1231	0.0338	4
Logging and Forestry	2.1146	0.0336	5
Petroleum and Coal Products	1.9162	0.0305	6
Other Services	1.7424	0.0277	7
Hotels and Restaurants	1.7003	0.0271	8
Electricity and Water	1.6301	0.0259	9
Paper, Printing and Publishing	1.6217	0.0258	10
Livestock	1.6031	0.0255	11

These sectors are predominantly Primary-producing and Service –providing in character. Manufacturing Sectors in this category are few.

ii) **Allocation Multipliers** These are strong for fourteen sectors, as shown in Table 2 below.

TABLE 2 . SECTORS WITH STRONG ALLOCATION MULTIPLIERS

SECTOR NAME	VALUE OF MULTIPLIER		RANK
	ABSOLUTE	STRENGTH	
Construction	4.5157	0.0766	1
Food	2.8475	0.0483	2
Trade and Other Transport	2.3296	0.0395	3
Tea	2.0476	0.0347	4
Tourism	1.9058	0.0323	5
Wood Products	1.7331	0.0294	6
Rubber	1.6091	0.0273	7
Textiles and Garments	1.5572	0.0264	8
Logging and Forestry	1.5476	0.0262	9
Other Services	1.5460	0.0262	10
Banking and Insurance	1.5262	0.0259	11
Other Agriculture	1.5208	0.0258	12
Livestock	1.5085	0.0256	13
Beverages	1.4840	0.0252	14

Here again, we find the list consisting of mostly Primary and Service Sectors.

On the basis of the above results, we identify the KEY Sectors of the economy as those with strong Allocation and Output Multipliers. These are:

TRADE AND TRANSPORT
RUBBER
LOGGING AND FORESTRY
OTHER SERVICES
BANKING AND INSURANCE
LIVESTOCK

As seen earlier, most of these sectors are traditional in nature.

iii) Weighted Output Multipliers and Weighted Allocation Multipliers

These COMBINED MULTIPLIERS obtained from the Ghosh-Leontief Duality are presented in Table 3 below.

TABLE 3. SECTORS WITH STRONG COMBINED MULTIPLIERS

SECTOR NAME	VALUE OF MULTIPLIER		RANK
	ABSOLUTE	STRENGTH	
TRADE AND OTHER TRANSPORT	0.2541	0.1676	1
TEXTILES AND GARMENTS	0.1298	0.0856	2
CONSTRUCTION	0.1208	0.0797	3
FOOD	0.0991	0.0654	4
OTHER AGRICULTURE	0.0961	0.0634	5
BANKINGAND INSURANCE	0.0714	0.0471	6
OTHER SERVICES	0.0635	0.0419	7
CHEMICALS & CHEM. PRODUCTS	0.0478	0.0315	8
TEA	0.0471	0.0311	9
PETROLEUM & COAL PRODUCTS	0.0360	0.0237	10

The results of these Combined Multipliers are important for three reasons. First, they are the empirical verifications of the Ghosh-Leontief Duality. Second, they show that among the top ten sectors, manufacturing sectors like Textiles & Garments, Construction, Chemicals and Chemical Products as also Petroleum & Coal Products have been included, implying that the Sri Lankan Economy may not be after all as traditional as the earlier results indicate it to be. But it is definitely not a highly interconnected, well-diversified and modernized economy. Finally, these results show considerable improvements in the strengths of the top ten sectors of the economy in terms of their degree of interlinkages within the economy.

III

CONLUSIONS

The duality between the Leonief and Ghosh models explains the identity between the Value-Added Structure of Final Usage Matrix and the Final-Allocation Structure of Value-added Matrix, which in turn explains why the Weighted Output Multipliers and the Weighted Allocation Multipliers are identical. A rupee worth of incremental primary allocation spread over different sectors according to the given distribution of value additions will have an impact of a rupee worth of incremental final expenditure, spread over the different sectors according to the given distribution

of final usage. The results will be the same whether we start from incremental primary allocations or from incremental final uses. Hence we may characterize these weighted multipliers as Combined Multipliers.

Turning to the results obtained from the applications on the Sri Lankan economy, we observe the empirical verification of the duality feature discussed above. It is seen that the key areas of the economy consist mainly of Primary and Service sectors. Hence it becomes imperative for the economy to modernize and develop strong linkages, improve productivity, diversify and strengthen the degree of interconnectedness of the various sectors of the economy.

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CLIMATE CHANGE, ENVIRONMENTAL POLLUTIONS AND PROSPECT OF SUSTAINABLE DEVELOPMENT IN INDIA

Kakali Mukhopadhyay*

Problem of climate change and related issues is a matter of concern for all especially for the scientists and social scientists of the world. It is observed that the developed countries are primarily responsible for Global Warming .The paper presents a brief overview of available evidence on impact of climate change on temperature, monsoon, water resources, human health, agriculture, forestry and coastal zone of India. It also discusses some protocols, which have been used so far to tackle the climatic change problem. Finally, the paper estimates CO_2 for India using Input-Output technique for the year 1991-92 and 1996-97 and suggests some policy issues or some mitigation options in this respect.

GLOBAL CLIMATE CHANGE: A BROAD OVERVIEW

The earth's climate has been evolving continuously over many millennia. Human activity around the globe has reached a level where it is beginning to affect the earth's climate. Global climate change has primarily occurred due to additional stress on ecological and socio-economic system that are already facing tremendous pressure because of sheer increase of world population, energy consumption and industrial activity. The last two centuries have witnessed the development of the green house problem which threatens to change climate in an unprecedented manner.

We know that the green house effect is a naturally occurring phenomenon. Green house gases or trace gases are CO_2 or carbon dioxide CH_4 or methane, N_2O or nitrous oxide, CFC or chloro- fluorocarbon, PFC or perflurocarbon and SF_6 or sulfur hexafluoride in the earth's atmosphere which allow incoming ultraviolet solar radiation to pass through relatively unimpeded, but partially absorb and reemit outgoing infrared terrestrial radiation. This natural process raises the earth's average temperature from -18° C to + 15° C and is hence, vital for life on earth.But increased emissions of green house gases are disturbing the balance of this complex system

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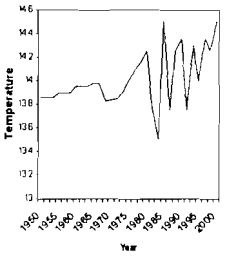
causing 'global warming'.It means warming up of the earth's surface temperature due to atmospheric concentration of green house gases. Since the Industrial Revolution anthropogenic activities have been increasing the atmospheric concentrations of green house gases beyond their natural levels, resulting in the enhanced green house effect. This causes an increase in global temperature, which is known as global warming. This warming can be amplified through positive feedback, such as increases in water vapour, or reduced through negative feedback, such as increase in stratospheric aerosols. These potential changes are referred to as climate change.

According to the Intergovernmental Panel on Climate Change (IPCC,2001), an international committee set up by the UN to track global warming, the average global temperature has already increased by 0.3-0.6^{0}C in the last one hundred years. Scientists have recorded the 1990s as the hottest decade in the world since the industrial revolution began. Scientists have also recorded that spring now arrives a week earlier in the northern hemisphere, tree lines in the northern most forests of the world are moving towards the poles, and ice shelves on Antarctica's northern fringe are disintegrating. **Graph 1***(*Aggarwal,2000*)* below shows that the global average temperature has increased from 13.8 to 14.6^0 c. India is currently facing one of the biggest threats it has ever faced, which could not only result in natural disasters and untold misery for its citizens in the years to come, but also compromise our future economic growth.

Graph 1 : Global average temperature 1950-1997



This threat is global warming. The series of floods and droughts suffered by the country in recent times have proved that these disasters take an enormous toll on life, and also the country's resources. Our capacities to deal with such disasters are limited. Studies conducted by scientists around the world warn that the possibilities of occurring these incidences are high in the future as a direct result of global warming. International negotiations to deal with the global warming problem are currently posing an even bigger threat. Developed countries like the US are not willing to take responsibility for their contribution to the global warming problem because they are afraid it will affect their economies. Rather, they are putting political pressure on less developed countries like India to take 'meaningful' action.

Problem of climate change and related issues is, thus, a matter of concern for all especially for the scientists and social scientists. The paper will concern with this.

The paper is organized as follows:

Who is responsible for climate change and who will suffer from that are discussed in *Section II*. *Section III* shows the overall impact of climate change and some India specific impact. *Section IV* discusses some protocols, which have been used so far to tackle the problem. *Section V* presents a case study of India by estimating CO_2 and suggests some policy issues or some mitigation options in this respect

II

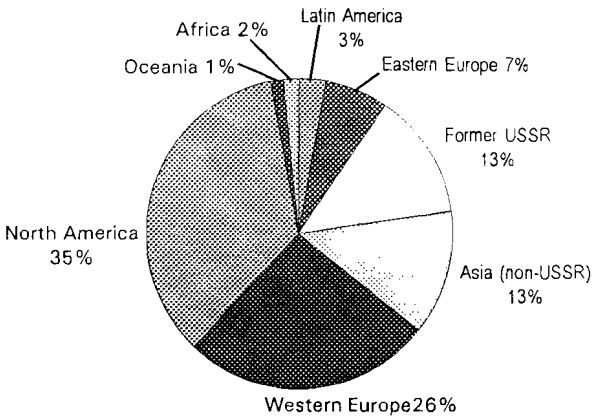
WHO IS RESPONSIBLE FOR GLOBAL WARMING ?

Developed countries who had a head start on developing countries in the industrialization process have been emitting carbon dioxide in the earth's atmosphere for years before developing countries. But then the harmful effects of these emissions were not known, and hence there were no restrictions on emissions.

Since carbon dioxide accumulates in the atmosphere for hundreds of years, the emissions by developed countries are still present in the earth's atmosphere, and are still causing global warming. Developed countries, therefore, are responsible for increasing the carbon dioxide concentrations in the atmosphere through their historical emissions. Data shows that carbon dioxide emissions of the developing countries like India have now grown as they follow the fossil fuel-intensive economic growth model set out by the rich countries, and try to achieve better standards of living. But even to this day, many industrialized countries emit more carbon dioxide than many developing countries **(Graph 2).**

The differences in the developed and the developing countries 'emissions are even more apparent when we take a look at per capita emissions of carbon dioxide. In 1996, the emissions of one US citizen were equal to 19 Indians, 30 Pakistanis, 17 Maldivians, 19 Sri Lankans, 107 Bangladeshis, 134 Bhutanese or 269 Nepalese. This is because of the energy intensive lifestyle of industrialized countries. Many of the uses of energy in the richer countries are for purposes of luxury, and the emissions caused from such uses may be termed *luxury emissions*. But the per capita emissions of developing countries are lower because a large number of poor people do not even have access to basic amenities such as electricity. They will need their share of ecological space to increase what could be termed *survival emission*.

Graph 2 Emissions of Carbon dioxide since 1800 AD (percentage



Source: Fred Pearce 1999, countdown to chaos, new science publications, London, Nov 29, pp22

Who will suffer most from global warming?

A team of scientists sponsored by the UN have reported (IPCC THIRD REPORT,2001) that developing countries are, on an average, twice as vulnerable as industrialized countries and small island developing countries are three times as vulnerable . A 15-95 cm rise in sea level could turn people now living on islands and in coastal areas into environmental refugees. Significantly, millions of people would be homeless due to adverse effects on small island states and low-lying deltas such as those in Bangladesh, Egypt and China.

It is estimated that while Central America, Brazil, Africa and India will suffer from a 2-10 percent loss in agricultural production, the US, Canada, China, and Australia will have an increase of production by 5-10 percent due to climate change.

Moreover, the impact of the warming is likely to lead to higher costs for developing countries than for industrialized countries (warming of 2-3 degrees by 2100 has been estimated to cost developing countries 5-9% of GDP) (Fankhausor 95) , as well as major disasters for island states and low-lying countries such as Bangladesh. Overall, it appears that more severe impacts can be expected in Asia and Africa as compared to higher latitude countries. As percentage of GDP, the overall impacts of a 2 X CO_2 climate change on South Asia and Africa are of the order of 8.5%, while those on Organization for Economic Cooperation and Development (OECD) countries are of the order of 1.6%. On the world as a whole, the impact is expected to be of the order of 1.5% to 2.0%.

III

Impact of climate change

This section presents a brief overview of the available evidence on impact of climate change with reference to India. It is a daunting task to estimate the potential impact of climate change, as the extent of uncertainty is vast. However, various studies point out that Global warming could have many disastrous effects on the society directly (water, food, habitat, health, economic infrastructure such as energy, transport and industry) and also through the environment (rainfall, sea level rise, extreme events such as hurricanes and typhoons, floods and droughts). Most studies on impact assessment have confined themselves to a particular future scenario, namely doubling of carbon dioxide (2 x CO_2) scenario.

India specific impact of climate change

India is highly vulnerable to climate change as its economy is heavily reliant on climate sensitive sectors like agriculture and forestry, and its low-lying densely populated coastline (6000-km long densely populated and low-lying coastline) is threatened by potential rise in sea level. Dealing with the natural disasters also imposes a huge cost on the country's economy, as is evident from the droughts and floods India has suffered over the last few years.

Increased temperature: Scientists from the Indian Institute of Technology (IIT), New Delhi,(TERI ,1999) reported that surface air temperature over India is going up at the rate of 0.4^{0}C per hundred years, particularly during the post-monsoon and winter season. Using models, they predicted that the mean winter temperature will increase by as much as 3.2^{0}C in the 2050s, and 4.5^{0}C by the 2080s, due to GHG. Summer temperature will increase by 2.2^{0}C in the 2050s and 3.2^{0}C in the 2080s.

Extreme temperature and **heat spells** have already become common over northern India, often causing loss of human life. In 1998 alone, 650 deaths occurred in Orissa due to heat waves.

Lonergan (1998) estimates that India's climate could become warmer under conditions of increased atmospheric carbon dioxide. The average temperature change is predicted to be in the range of 2.33^{0}C to 4.78^{0}C with a doubling in CO_2 concentrations. Lal ,Cubasch , Voss , Waszkewith (1995) present a climate change scenario for the Indian subcontinent, taking projected emissions of green house gases and sulphate aerosols into account. It predicts an increase in annual mean maximum and minimum surface air temperatures of 0.7^{0}C and 1.0^{0}C over land in the 2040s with respect to the 1980s.

Effect on monsoon: India is heavily dependent on the monsoon to meet its agricultural and water needs, and also for protecting and propagating its rich biodiversity. Subtle changes have already been noted in the monsoon rain patterns by the IIT, Delhi,(TERI,1999) despite the 11 near normal monsoons in a row. IIT scientists warn that India will experience a **decline in summer rainfall** by the 2050s. Since summer rainfall accounts for almost 70 percent of the total annual rainfall over India and is crucial for Indian agriculture, this could have a devastating effect on the Indian economy, and on food security. In a detailed study of Indian monsoon rainfall records, Parthasarathy, Rupakumar and Munot (1993) have shown that no systematic trend in Indian rainfall exists over the last 100 years. However, large inter-annual and decadal variations have been observed. On the other hand, out of 306 rainfall stations studied by Rupakumar *et al.* (1992), about 18 in the west coast and the central peninsula showed increasing trends in rainfall, and about 13 in the north-east and north-west peninsula, and north-east India showed declining trends. This study also reports a large inter-annual variability.

Effect on water resources: Relatively small climatic changes can cause large water resource problems, particularly in arid and semi-arid regions such as northwest India. This will have an impact on agriculture, drinking water, and on generation of hydroelectric power, resulting in limited water supply and land degradation.

Apart from monsoon rains, India uses perennial rivers, which originate and depend on glacial melt-water in the Hindukush and Himalayan ranges. Since the melting season coincides with the summer monsoon season, any intensification of the monsoon is like to contribute to flood disasters in the Himalayan catchment. Rising temperature will also contribute to the raising of the snowline, reducing the capacity of this natural reservoir and increasing the risk of flash floods during the wet season.

Human health: Modeling suggests that the rise in temperature and change in humidity will adversely affect human health in India. Heat stress could result in heat cramps, heat exhaustion, heat strike, and damage physiological functions, metabolic processes and immune systems. Increased temperature (particularly minimum temperature) can increase the range of vector borne diseases, particularly in regions where minimum temperature currently limits pathogen and vector development.

Stress on food supply, water availability, sea level rise and changes in ecosystem are likely to have additional effects on human health in India. Water borne diseases, natural disasters, environmental migration, nutritional deficiency could be other major risk factors.

A recent study conducted by Chatterjee (2001) on environmental pollution and its impact on the incidence of morbidity and mortality pattern for Delhi clearly shows that pollution (due to GHG emission) is one of the major causes for the deteriorating health conditions of the people in Delhi. She has revealed that SO_2, NOx and SPM are the principal causes of air pollution due to the growth of the industrial units as well as number of vehicles. She also found a positive correlation between the trend of mortality and morbidity of respiratory diseases and air pollution.

Impact on agriculture

Agriculture and allied activities constitute the single largest component of India's economy, contributing nearly 30% of the total Gross Domestic Product (GDP). This sector provides employment to 68% of the total workforce and accounts for 21% of total exports (GOI. 1997). However, given that 65% of the net sown area of 142 mha is dependent on rainfall (TERI. 1999), Indian agriculture continues to be fundamentally dependent on the weather.

Several studies predict that rice and wheat yields could decline considerably with climate changes in India. Seshu and Cady (1984) estimate a decrease in rice yield at the rate of 0.71 ton/ha with an increase in minimum temperature from 18°C to 19°C and a decrease of 0.41 ton/ha with a temperature increase from 22°C to 23°C. Sinha and Swaminathan (1991) estimate that a 2°C increase in mean air temperature could decrease rice yields by about 0.75 ton/hectare in the high yield areas and by about 0.06 ton/hectare in the low yield coastal regions. Further, a 0.5°C increase in winter temperature would reduce wheat crop duration by seven days and reduce yield by 0.45 ton/hectare. An increase in winter temperature of 0.5°C would thereby translate into a 10% reduction in wheat production in the high yield states of Punjab, Haryana and Uttar Pradesh. Rao and Sinha (1994) in their crop-simulation study estimate that under a 2 x CO_2 climate change scenario, the wheat yields could decrease by 28%-68% without considering the carbon dioxide fertilization effects. Kumar and Parikh (1998) estimate that even after accounting for farm-level adaptation, the loss in farm level net revenue would range between 9% and 25% for a temperature rise of 2°C-3.5°C. Sanghi , Mendelsohn, and Dinar (1998) calculate that a 2°C rise in mean temperature and a 7% increase in mean precipitation would reduce net revenues by 12.3% for the country as a whole. Agriculture in the coastal regions of Gujarat, Maharashtra, and Karnataka is found to be the most negatively affected.

Impact on forestry

In addition to their crucial ecological role, forests make a considerable contribution to the Indian economy. In 1996-97, forestry and logging accounted for nearly 1% of GDP in 1980-81 prices. Moreover, non-timber forest products provide

about 40% of total official forest revenues and 55% of forest-based employment. Nearly 55 million people living in and around forests in India depend upon non-timber forest products as a critical component for their sustenance (TERI. 1999).

Climate is an important determinant of the geographical distribution, composition and productivity of forests. Therefore, changes in climate could alter the configuration and productivity of forest eco-systems. These changes, in turn, could have profound implications for traditional livelihood, industry, biodiversity, soil and water resources, and hence, agricultural productivity. Moreover, these climate change-induced effects would aggravate the existing stresses due to non-climate factors, such as land use changes and the unsustainable exploitation of natural resources.Ravindranath and Sukumar.(1998) discuss the impact of two climate change scenarios on tropical forests in India - one involving green house gas forcing and the other incorporating the effects of sulphate aerosols. The first scenario, associated with increased temperature and rainfall, could result in increased productivity, migration of forest types to higher elevations, and transformation of drier forest types to moisture types. The second scenario, involving a more modest increase in temperature and a decrease in precipitation in central and northern India, could have adverse effects on forests. In a case study of the southern Indian State of Kerala, Achanta and Kanetkar(1996) link the precipitation effectiveness index to net primary productivity of teak plantation. Results indicate that under the climate scenarios generated by the ECHAM3 climate model, the soil moisture is likely to decline and, in turn, reduce teak productivity from 5.40 m3/ha to 5.07 m3/ha. The study also shows that the productivity of moist deciduous forests could decline from 1.8 m3/ha to 1.5 m3/ha.In a study conducted by the Stockholm Environment Institute in collaboration with TERI, Deshingkar, Bradley , Chadwick , Leach (1996) apply the BIOME model to project future climate-induced shifts in geographical location and changes in area under different forest types in the north Indian State of Himachal Pradesh. The social and economic impact of changes in forest structure on rural communities and the local economy are examined through a case study of the Mandi district in Himachal Pradesh.

Impact on coastal zones

India has a low-lying densely populated coastline extending to about 6500 km. UNEP (1989) identifies India among the 27 countries that are most vulnerable to sea level rise. Most of the coastal regions are agriculturally fertile, with paddy fields that are highly vulnerable to inundation and salinization. Coastal infrastructure, tourist activities, and onshore oil exploration are also at risk. The impact of any increase in the frequency and intensity of extreme events, such as storm surges, could be disproportionately large, not just in heavily developed coastal areas, but

also in terms of the paralyzing devastation in low-income rural areas. The 1999 tropical cyclone that hit Orissa resulted in a death toll of about 10,000, and demonstrates the extreme significance of impact related to climate variability.

A case study of Orissa and West Bengal (IPCC. 1992) estimates that in the absence of protection, a one-meter sea level rise would inundate 1700 km^2 of predominantly prime agricultural land. JNU (1993) shows that in the absence of protection, a one-meter sea level rise on the Indian coastline is likely to affect a total area of 5763 km^2, and put 7.1 million people at risk. The dominant cost, as extent of vulnerably, however, depends not only on physical exposure, but also on the level of economic activity in the region. TERI (1996) provides a district level ranking of vulnerability to one-metre sea level rise by constructing a weighted index. The study also assesses the economic implications of such a rise on the most and least vulnerable districts in order to provide the range of projected economic impact on the Indian coast. In present value terms, the result ranges from Rs. 2287 billion in the case of Mumbai, to Rs. 3.6 billion in the case of Balasore. Table 2 gives the cost of protection and value of anticipation of sea level rise for these representative districts.

Table 1 : Effect of 1-m sea-level rise on coastal area and population

	Coastal area (million hectares)			Population (million)		
State/Union territory	Total	Inundated	Percentage	Total	Affected	Percentage
Andhra Pradesh	27.504	0.055	0.19	66.36	0.617	0.93
Goa	0.370	0.016	4.34	1.17	0.085	7.25
Gujarat	19.602	0.181	0.92	41.17	0.441	1.07
Karnataka	19.179	0.029	0.15	44.81	0.25	0.56
Kerala	3.886	0.012	0.30	29.08	0.454	1.56
Maharashtra	30.771	0.041	0.13	78.75	1.376	1.75
Orissa	15.571	0.048	0.31	31.51	0.555	1.76
Tamil Nadu	13.006	0.067	0.52	55.64	1.621	2.91
West Bengal	8.875	0.122	1.38	67.98	1.600	2.35
Union territory						
Andaman and Nicobar Islands	0.825	0.006	0.72	0.00	0.000	0.00
India	139.594	0.571	0.41	416.74	7.100	1.68

***Note* : Coastal area and population are based on the 1981 and 1991 census.**
Source : JNU, 1993

Table 2 : Impact of 1-m sea-level rise on coastal districts (billion 1990 rupees) (4.5% rate of growth, 5% discount rate)

Coastal areas	Economic impact	Value of anticipation	Cost of protection
Mumbai	2287	1061	0.76
Goa	81	36.5	1.42
Balasore	3.6	1.3	1.25

Source : **TERI, 1996.**

Thus the above discussions point out that global warming creates a severe impact in India.

IV

What has the world done so far to deal with the global warming problem?

To deal with the climate change problem by reducing GHG emissions, various protocols and frameworks have been introduced with no clear cut results. The present section reviews some of these protocols.

In 1979 a group of international scientists concerned about global warming convened the first World Climate Conference.These scientists were instrumental in bringing the issue of global warming to the attention of world leaders.

In 1988 the United Nations established the Intergovernmental Panel on Climate Change (IPCC), a group of 2000 international scientists directed to study and report on global warming. In this regard an international protocol called the Montreal Protocol of Substances that deplete the Ozone layer came into force in January 1989,which aims at reducing and eliminating the production and use of the controlled Ozone depleting substances, including CFCs.

In 1990 the IPCC convened a second World Climate Conference, and issued a report, which set forth scientific evidence for the occurrence of global warming.

In 1992 an international conference on global warming involving world leaders was held in Rio de Janeiro.The convention was adopted on 9th May 1992 in New York, and signed at the 1992 earth summit in Rio de Janeiro by more than 150 countries and the European community. The attendees drafted a document called the United Nations Framework Convention on Climate Change (UNFCCC). Its ultimate objective is the "Stabilization of GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate

system."It contains commitments for all parties. Under the convention, parties included in Annex I aim to return GHG emissions not controlled by the Montreal protocol to 1990 levels by the year 2000.The convention entered in force in March 1994. Although this commitment document was signed by the attendees, no green house gas (GHG) reduction targets were specified.

In 1995 the IPCC issued a second report on global warming which contained the bombshell statement that "the balance of evidence suggests that there is a discernable human influence on global climate". With this statement, an international group of scientists not only have confirmed the existence of global warming; they have also attributed it to human activities.

In December 1997 another international conference involving world leaders was held in Kyoto, Japan.It was adopted at the Third Session of the Conference of Parties (COP) to the UNFCC. At this conference, attendees attempted to establish reduction goals for GHG emissions that would be legally binding on nations. There was much disagreement and controversy. One of the major issues involved GHG reduction Commitments for "developed" countries such as the US, Germany, Japan and Britain vs. Commitments for "developing" countries such as China, India, Mexico and Argentina. Developing countries argued that the imposition of GHG emission targets on them would impede their economic growth, and limit their ability to compete in world markets with developed countries. Furthermore, they maintained that since the global warming problem was the fault of industrialized, developed countries, they alone should be made to take the emission cuts. Despite this major issue, the conference attendees did draft the "Kyoto Protocol" which committed developed countries to reduce their collective GHG emissions by 5.2% from 1990 levels during the period 2008-2012. No requirements were imposed on developing countries. Another concern involved the rate of economic growth of developing countries and their CO_2 emissions. At the current rate, developing countries would catch up to and begin to exceed developed countries in CO_2 emissions by the year 2035 .At the Kyoto conference, the US also proposed a "cap and trade program" for GHG emissions. Limits would be set on GHG emissions (the cap), and countries or companies that were under the cap in terms of emissions could sell GHG allowances to other companies or countries. Other variations on this idea have been put forward.

The most recent international conference was in Buenos Aires, Argentina in November 1998. The US finally signed the Kyoto Protocol, but this was merely a symbolic gesture since it still requires ratification by the US Senate. There was one development at the conference. Argentina astounded attendees by being the first developing country to agree to reductions.

For two weeks beginning on 12th November, government delegates from over 180 nations met at Hague (2000) in the Netherlands to negotiate an agreement on how to address the issues on global warming and climate change. The sixth conference of parties (COP6) of the UNFCC focussed on getting signed the agreements by the developed countries known as Annex I countries under the Kyoto protocol and initiated a worldwide process to reduce GHG emissions, which are causing the adverse impact on climate change. It also addressed that nobody will suffer more from climate change than the poor countries.

Recently the Bonn deal on climate agreement in July 2001 states that "there will be economic benefits for those countries who will implement the treaties". But Mr. Bush has said the US will not ratify Kyoto, partly because he believes it would damage the US economy, and also because it does not yet require developing countries to cut their pollution in the way developed countries must.

But the report says unilateral implementations of the protocol by the European Union could give its industries a head start in developing new technologies to cut emissions. It says the EU could achieve from 85% to 95% of its Kyoto target without damaging its economic competitiveness,"with smart policies being able to offset the remaining competitive impacts."

The above protocol mainly briefs to curtail the CO_2 emission. Because CO_2 is the most important of the GHGs in the sense that it will make the largest single contribution to any global warming over this century and the major source of anthropogenic CO_2 emissions is fossil fuel combustion. In this context we have estimated the CO_2 emission in India during the last decade with a discussion of GHG emission in India in the next section.

V

GHG emissions: the Indian scenario

India ranks among the worlds' top GHG-emitting countries. However, if one considers the per capita emissions, then the relative share of India is low. In the global context, a comparison of the CO_2 budget for India as against the global budget indicates that the total Indian contribution from various sources is about 2.2% of the global emissions. The current gross emissions per capita in India are only one-sixth of the world average (ADB 1994). India is currently the sixth largest and second faster growing GHG contributor to climate change in the world. Comparatively, the developed world is emitting 33 times more CO_2 emissions. According to TERI, India's carbon dioxide emissions have been increasing by 6% per year. Total

emissions have increased tenfold since 1950. Power generation, as a GHG source, is the single biggest source of carbon dioxide emissions in India. In 1997, total CO_2 emissions from India contributed upto 4% of the world's carbon, or 237 million metric tons of carbon emissions.

Estimation of CO_2 emissions in India

The above discussion throws ample light on the importance of CO_2 emissions in respect of their effects upon various development variables. In this context, it is necessary to know the industry-wise total (direct and indirect) CO_2 emissions in India, which will give us a concrete idea about the likely effects of the CO_2 emissions from these industries on the prospect of sustainability of development in our country.

Considering this fact we estimate CO_2 emission in India during 1990s and suggest some policy options to combat their evil effects.

Methodology: Carbon dioxide emission and intensities of major energy consuming industries of India have been estimated with the help of Input-Output model. The input-output model is a widely used tool in analysing pollution problems. The methodology for relating economic activity to the natural environment in an input-output framework is convenient and popular.

CO_2 is released mainly from fossil fuel combustion and from bio -mass combustion. The sources of fossil fuel combustion are coal combustion, oil combustion and gas combustion. Here we deal with the fossil fuel combustion only.

The model starts with the basic concepts of the input-output framework of Leontief.

$$X = AX + Y \qquad (1)$$

$$X = (I-A)^{-1} Y \qquad (2)$$

Here X defines the total output vector (nx1),Y(nx1) is final demand vector and A is a technical coefficient matrix (nxn). Equation (2) gives the relationship between gross output levels and final demand deliveries, taking account of indirect as well as direct requirements.

For analysis of CO_2 emission we need to extend the above conventional input-output framework in one important respect, i.e. we have to compute the amount of CO_2 emission that takes place in the production of various activity level. We apply the fuel specific carbon emission factors to the row vector of fossil fuel sector of the respective Input- Output table to estimate the total CO_2 emitted by coal and oil sector. We use an emission factor of 0.55 (mt of CO_2)/mt for coal and 0.79 (mt of

CO_2)/mt for crude oil and 0.67 mt of CO_2/m.c.m for natural gas to arrive at carbon emissions by different sectors due to coal, oil and natural gas separately. Then we follow the normal convention of measurement of carbon dioxide in carbon equivalent units. For conversion to CO_2 units the carbon emission figures are multiplied by 3.66.

The CO_2 emission from fossil fuel combustion has been estimated by following IPCC (Inter governmental panel on climate change) guideline, where

Total CO_2 emissions = (Actual fuel consumption) * (Carbon emission factor) * (Fraction of carbon oxidized) *(Molecular weight ratio of CO_2 is to carbon i.e. 44/12 or 3.66).

The values of the fraction of carbon oxidized for the fuels are given below

Coal & Lignite =0.98, Crude oil & Natural gas = 0.99

On the basis of the above estimated figure we can calculate the direct carbon dioxide emission coefficient, which can be written as:

$$C = \{C(j)\} \text{---} (3)$$

Equation (3) is a vector of fossil fuel emission coefficients representing the volume of CO_2 emissions per unit of output in different sectors. That is, when the sectoral volume of CO_2 emission is divided by sectoral output, it gives us the direct CO_2 emission coefficient.

The total (direct and indirect) carbon emission coefficient of sector j can be defined as

$\Sigma C_j r_{ij}$, where r_{ij} is the (i,j)th element of the matrix $(I-A)^{-1}$. The direct and indirect CO_2 of a sector is defined as emission caused by the production vector needed to support final demand in that sector.

The above estimation procedure has been applied in **India** for the year **1991-92 and 1996-97. Input-Output tables for the year 1991-92 and 1996-97** (Planning Commisiion1995, 2000) have been used to implement the model.

RESULTS

Tables 3-6 present the results. The estimated figures of CO_2 from coal and oil combustion are displayed in Table 3.

Table 5 : DIRECT CO_2 EMISSION COEFFICIENT IN INDIA DURING 1991-92 AND 1996-97(mt Of CO_2/mtcr & mt Of CO_2/mrs)

SL.NO.	SECTORS	1991-92	1996-97
1	COAL & LIG	0.00957	0.00731
2	CR. OIL & N. GAS	0.00000	0.00000
3	ELECTRICITY	0.82052	0.80731
4	AGRICULTURE	0.00001	0.00001
5	MINING & QUARYING	0.00002	0.00001
6	SUGAR	0.00005	0.00006
7	FOOD & BEVE AREGES	0.00014	0.00024
8	TEXTILE AND TEXTILE PRODUCTS	0.00012	0.00008
9	WOOD & WOOD PRODUCTS	0.00003	0.00002
10	PAPER & PAPER PRODUCTS	0.00057	0.00042
11	LEATHER AND LEATHER PRODUCTS	0.00004	0.00002
12	RUBBER & PLASTIC PRODUCTS	0.00004	0.00003
13	PETROLEUM PRODUCTS	0.03668	0.02995
14	FERTILIZER	0.00096	0.00083
15	CHEMICAL AND CHEMICAL PRODUCTS	0.00009	0.00016
16	CEMENT	0.00429	0.00275
17	OTHER METALLIC MINERAL PRODUCTS	0.00118	0.00137
18	IRON & STEEL	0.00133	0.00114
19	BASIC METAL, METAL PRODUCTS & MACH INERY	0.00005	0.00008
20	CONSTRUCTION	0.00000	0.00000
21	TRANSPORT	0.00022	0.00012
22	TRADE & OTHER SERVICES	0.00004	0.00002

Table 6 contains total (direct and indirect) CO_2 coefficients during the above period.

From a look at the results contained in Table 5 and Table 6 we observe that all the sectors show a more or less similar pattern in case of direct and total coefficients throughout the period. The total coefficient is higher in all sectors than direct coefficient.

The sectors (electricity, coal, transport) turned out to be largely responsible for CO_2 emission in India when they are viewed in terms of total (direct and indirect) emissions due to final demand in each sector.

Table 6 : TOTAL (DIRECT & INDIRECT) CO_2 EMISSION COEFFICIENT IN INDIA DURING 1991-92 AND 1996-97 (mt Of CO_2/mtcr & mt Of CO_2/mrs)

SL.NO.	SECTORS	1991-92	1996-97
1	COAL & LIG	0.07806	0.07870
2	CR. OIL & N. GAS	0.05346	0.05844
3	ELECTRICITY	1.41212	1.31151
4	AGRICULTURE	0.00108	0.00104
5	MINING & QUARYING	0.00395	0.00516
6	SUGAR	0.00098	0.00101
7	FOOD & BEVE AREGES	0.00124	0.00141
8	TEXTILE AND TEXTILE PRODUCTS	0.00124	0.00133
9	WOOD & WOOD PRODUCTS	0.00082	0.00078
10	PAPER & PAPER PRODUCTS	0.00225	0.00204
11	LEATHER AND LEATHER PRODUCTS	0.00086	0.00080
12	RUBBER & PLASTIC PRODUCTS	0.00123	0.00122
13	PETROLEUM PRODUCTS	0.04191	0.03445
14	FERTILIZER	0.00489	0.00375
15	CHEMICAL AND CHEMICAL PRODUCTS	0.00199	0.00230
16	CEMENT	0.00828	0.00678
17	OTHER METALLIC MINERAL PRODUCTS	0.00424	0.00465
18	IRON & STEEL	0.00581	0.00544
19	BASIC METAL, METAL PRODUCTS & MACH INERY	0.00151	0.00157
20	CONSTRUCTION	0.00241	0.00230
21	TRANSPORT	0.00834	0.00655
22	TRADE & OTHER SERVICES	0.00051	0.00046

POLICY OPTIONS

Considering the overview of climate change and also the findings of CO_2 in India we submit that our major concern today is to curb the emissions of particulate and the green house gases into the atmosphere. It is, therefore, necessary to reduce the consumption of fossil fuels and maximize the utilization of environmentally clean energy sources and fuels for providing energy .To achieve let us suggest few policies.

The priorities have to be given to the *conservation of energy*, which will play a significant role in alleviating the shortage of energy, and in reducing green

house gases effect The government has to ensure strict implementation of the energy conservation act. The enhancement of the national consciousness and the progress in Science and Technology of energy conservation would promote rationalisation of energy consumption.

In this connection we suggest that efficiency and conservation of energy is also possible through *inter-fuel substitution.* Out of the fuel sector electricity emissions have the highest increase among energy sources suggesting that local electric plants should increase the share of non fossil fuel and natural gas to reduce the CO_2 emission in India. So inter-fuel substitution can help to mitigate carbon problem. Replacing high carbon coal and midrange oil with lower carbon natural gas, or with zero carbon renewable, and nuclear power can dramatically lower CO_2 emissions for industrial sector.

More specifically, in case of electrification biomass based power plant should be the right options to mitigate CO_2.The use of plant material as fuel and feedstock in place of fossil fuels can have a significant effect on the reduction of net CO_2 emissions. Alcohol biomass fuels for transport have played a major role in Brazil (Goldemberg et al, 1993) and plantations could provide significant bio fuels in many countries (Hall et al, 1993).

Besides fossil fuel sectors a proper weightage should be given on the steel and iron industry in India as it is one of the major source of air pollution as our findings report .It involves not only upgrading their processing procedures but also increasing the effective utilization of coal consumption. Short-term improvements can be brought about by good maintenance, whilst long term measures include new technologies, recovery of waste heat and computer monitoring of energy use. Pollution management, currently concentrating on equipment and technology, must address the need to heighten awareness among employees, and integrate this ethos into operational and maintenance practices.

The transport sector is also an area of attention by the policy makers. We suggest some specific policies for control of vehicular pollution. Old vehicles should be prohibited from plying by phasing out; registration of new auto rickshaws with front engines should be banned in major cities, and implementation of Euro I and Euro II norms of emission should be carried out without delay.

For energy conservation, efficiency and Research and Development and technological upgradation a suitable energy price policy has to be framed.

Last but not least, the government should consider introducing clean energy technology. Clean energy technology (CET) is defined as those technologies that

combine more efficient processes and reduced pollutant production without necessarily entailing change in the form of energy used. Clean coal technologies like integrated gasification combined cycle (IGCC) plants should be encouraged in industry and power generating plants. These technologies typically reduce emissions of CO_2 and provide improvements in energy efficiency when compared with traditional coal combustion technologies.

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Interest Rate Determination for Rural Informal Credit : An Empirical Investigation with Reference to West Bengal

Abdur Rahim*

Various theories have been formulated to explain the higher rates of interest on informal loans in the rural credit market and greater variations in them than those on formal loans. The 'lender's risk hypothesis', the poor marketability of collaterals and inter-linked nature of informal credit transactions, inter alia, are advanced as probable explanations. Some researchers also emphasize the role of social factors such as caste, education of the borrowers in the determination of interest rates on informal loans. This paper looks afresh into these causes and many other factors that are likely to have significant impact on interest rates on informal loans and assesses the relative importance of them using primary data collected from some villages in West Bengal. The factors considered in this study are per capita income, caste, education, sources of loans, collaterals, purpose of loans, period of loans, inter-linking among product, labour and rural credit markets, size of loan and regions.

INTRODUCTION

An issue that has been a subject of considerable debate in recent years, in the context of the workings of rural credit markets, is the determination of interest rate in the case of informal loans in rural areas. This issue has been dealt with both at theoretical and empirical levels[1]. The past researchers working in this area not only observed the rate of interest for the informal loan to be very high but also found the same to move around a wide range of values even within the same region (Platteau *et al*, 1985; Sarap, 1990, 1991). Several explanations have been offered as regards high rate of interest usually charged on the informal loans. The early explanation has been provided by Bottomley (1963, 1975) in terms of what is known as the "lender's risk hypothesis". According to this hypothesis, as the risk of loan default is high in rural areas, the moneylenders charge higher rate of interest on loans. Moreover, as the extent of defaulted amount of loan is likely to vary from

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borrower to borrower, the rate of interest charged too differs. This hypothesis has been duly supported by the empirical study conducted in some villages of Bihar by Gupta (1991).

Nevertheless, as opposed to the above hypothesis, some scholars sought to explain high rate of interest in the case of informal loans from an alternative perspective. In this context, they emphasized the very personalized nature of loan transactions and also the unequal social and economic relation that exists between the rural borrowers and informal lenders. Bhaduri (1977, 1983) constructed a model of determination of interest rates in backward agriculture along this line. The crux of Bhaduri's argument is that the quality of collateral offered for loan by the rural borrower is low and hence unacceptable to the formal lending agencies. This provides some sort of monopoly power to the rural moneylender. This along with the inelastic demand for loan enables the moneylender to fix interest rate freely.

Bhaduri's model provoked further studies - both theoretical as well as empirical - in the eighties and early nineties. Several other factors thus got highlighted as prospective determinants of interest rate for the informal loan. For example, it has been argued that not only the quantity of collateral but also its quality are important for the determination of interest rate for informal loan. More specifically, it has been argued that the rate of interest charged is higher on the informal loan that is obtained by providing collateral having less marketability. Some scholars emphasized the importance of the borrower's economic status in determining the rate of interest for the informal loan. A well-to-do borrower is supposed to enjoy greater bargaining strength and is likely to obtain loans in the informal market at a lower rate of interest (Swaminathan, 1991, 1993). Some other scholars explained higher rate of interest on the informal loans in terms of inter-linked nature of informal credit transactions. They emphasized that the rate of interest is likely to be higher for the credit transactions that are linked with other contracts (e.g. product) [see Sarap, 1990, Reddy, 1992]. So far as the inter-linked loans often embody several types of implicit interest charges on the borrowers, the total interest charges (explicit plus implicit) are thus likely to be higher on such loans. Alongside these factors, some scholars found the rate of interest to be governed by the sociological factors such as the caste status and education levels of the borrowers. The hypothesis has been that the households coming from lower caste and/or having lower formal education pay higher rate of interest, while borrowing from the informal lender, than those having superior caste position and higher education (see, for example, Swaminathan, 1991, 1993).

In this backdrop the main purpose of this paper has been to look afresh into causes behind high rate and variation in interest rates on the rural informal loans

using primary data collected from some sample villages in West Bengal. In other words, our objective has been to identify the major determinants of interest rates on the rural informal loans in the context of our study areas.

The primary data used by us have been collected from eight sample villages drawn from two contiguous districts of West Bengal, namely Hooghly and Bankura. The districts chosen for our study differ markedly in terms of levels of agricultural development. While Hooghly is known to be an agriculturally prosperous district, Bankura is far backward on this count[2]. For collection of primary data, we have employed the procedure of two-stage stratified random sampling. At the first stage, we randomly selected four villages from each district. Next, from each village, we randomly selected our sample respondents covering the categories of agricultural labourers, marginal farmers (operating land less than 2.50 acres), small farmers (2.50-4.99 acres), medium farmers (5.00-7.49 acres) and large farmers (7.50 acres and above) with probability proportional to the size of each category. Total 420 households have been surveyed from these villages. Out of these 420 households, 359 of them turned out to be the participants in the informal credit market during the reference period for field survey (July 1991 to June 1992)[3]. It is found that these households were involved in a total of 626 informal loan contracts during this period[4].

The plan of the paper is as follows: in section II we briefly discuss some features of credit market structure in our sample areas. Section III provides a brief idea about the extent of variation in interest rates on the informal loans in our study areas while section IV explores the main determinants of interest rates on informal loans in the context of our study areas. The final section provides the main conclusion emerging from this study.

II

SOME FEATURES OF CREDIT MARKET STRUCTURE IN STUDY AREAS

In this section, we provide some brief idea about the features of credit market structure in our study areas. This is necessary because the interest rate structure for informal credit in any region is very likely to be influenced, *inter alia*, by the structure and nature of functioning of the credit markets (both formal and informal) typical of that region. In particular, the availability of formal credit, the nature of participation and accessibility of various categories of households to formal credit, the composition and strengths of the informal lenders, the terms and conditions associated with the informal loans etc. are likely to be crucial in determining the interest rate structure for informal credit.

In our study areas comprising eight villages from the districts of Hooghly and Bankura in West Bengal, the rate of participation of the rural households in credit markets (formal and/or informal) has been extremely high. More than 90 per cent of all households have turned out to be the borrowing households (for details, see Bhaumik and Rahim, 1998). This is reflective of their acute need for credit. However, the rural households do not confine themselves to the formal credit sources alone. Thus, the informal credit operates simultaneously and indeed more strongly alongside the formal credit in our study areas. We find that, of the total amount borrowed by the rural households during the survey period (July 1991 to June 1992), the share of informal sector alone has been nearly two-thirds (see Bhaumik and Rahim, 1998). This clearly implies that the availability of formal credit has been highly inadequate which forced all categories of rural borrowers to depend heavily on informal credit sources.

In the literature regarding the structure of informal credit markets it has been pointed out that the rural informal lenders do not constitute a homogeneous category (see Ghate *et al* 1992, Ch. 1). In fact, different groups of informal lenders operate in rural areas with different motives. This seems to be true in the context of our study areas as well. In our study areas, various types of informal lenders operated freely of whom the most prominent ones have been the village moneylenders. We found that the village moneylenders alone supplied nearly one-quarter of total informal loan in our survey areas (see Bhaumik and Rahim, 1998). The other prominent informal lenders in our surveyed villages have been the 'inputs sellers' and 'friends and relatives'. Our data revealed that these three categories ('villages moneylenders', 'inputs sellers' and 'friends and relatives') together supplied nearly 75 per cent of total informal loan amount in the villages surveyed by us. This apart, the categories of traders and big cultivators shared in about one-fifth of total informal loan amount.

In the market for informal credit, each lender may have his/her own preference for a borrower. It may then be possible to establish some relationship between the lender and borrower types. We observed that among various types of borrowers, the categories of marginal and small farmers are preferred most by the village moneylenders. The traders have also revealed their inclination for these categories. On the other hand, while the class of 'inputs sellers' displayed a tendency of serving all categories of farmers, yet their preference for better-off farmers is clearly established in the surveyed villages. The incidence of better-off farmers obtaining loans from their 'friends and relatives' has also been greater in our study areas. However, the big cultivators have mostly preferred the categories of agricultural labourers and marginal farmers while advancing loans. Most of these are inter-linked loans representing credit-labour inter-linkages (see Bardhan, 1979, 1983).

In order to understand the terms and conditions associated with informal loan contracts, we have looked into aspects such as the purposes of loan, loan duration, collateral securities offered etc. by the borrowers (see, for details, Bhaumik and Rahim, 1998). We found that the rural households obtained formal loans almost exclusively for production purposes. However, the informal sources also supplied production loans since the availability of formal loans have not been adequate. Apart from bridging the credit gap created by inadequate availability of formal credit, the informal lenders also provided the consumption loans to the rural households. Among the informal lenders, the 'inputs sellers' and the traders supplied the production loans only. On the other hand, most important suppliers of consumption loans have been the 'big cultivators', 'village moneylenders' and 'friends and relatives'. As regards duration of loan, we found that a majority of formal loans in our surveyed villages are of shorter duration type (for six months or less). This is mainly because the formal loans have been obtained mostly for the purpose of crop production for which the loan duration normally does not exceed six months. Thus, the households requiring longer duration loans or those who are unsure about the time when the loans would be available from formal sources approached the informal lenders. Another important feature about loan duration is that for a good percentage of informal loan cases (nearly 31 per cent), the duration of loan has remained 'unspecified' in our survey villages (see Bhaumik and Rahim, 1998). These are the cases where the informal lenders did not insist upon quick repayment of loan principal since they charged and received relatively higher interest charges. Our detailed inquiry with the informal borrowers reveals that mostly the village moneylenders have advanced these loans (where loan duration remains unspecified).

As regards the collateral securities offered, we find that contrary to the case with the formal credit arrangements, non-land and non-marketable collateral (particularly, product and labour services) dominated the informal loan contracts in our study areas. This implies that the households having adequate land to offer as collateral approached formal credit agencies for loans while those having more of non-marketable collateral fell back upon the informal lenders. In our study areas, it is also possible to discern a clear relationship between the lender type and collateral preference. In particular, we found that while the traders and 'inputs sellers' viewed product (crop output) as the most acceptable collateral, the big cultivators preferred future labour services as collateral while advancing loans. However, the village moneylenders almost invariably accepted marketable collateral such as gold / utensils while advancing loans.

In sum, our study areas have been characterised by weak development of formal credit institutions. Consequently, the informal credit operated rather strongly in our

study areas so much so that the informal lenders met nearly two-thirds of total loan requirement by rural households. Among various categories of informal lenders, the most prominent have been the village moneylenders. They alone supplied one-fourth of total informal loan amount. In fact, in the villages surveyed by us, the village moneylenders pursued a highly exploitative form of money lending[5]. They offered loans only against some collateral that are marketable (e.g. gold and utensil) and at the same time charged very high rates of interest on the loans advanced by them. Our discussion below would reveal that it is this specific feature of the informal credit system that necessitates revising some of the existing hypotheses relating to determination of interest rate on rural informal credit in the context of our study areas.

III

EXTENT OF VARIATION IN INTEREST RATES FOR INFORMAL CREDIT

The view that the interest rate on rural informal credit is very high and it displays a considerable variation across rural households is corroborated in terms of our data presented in Table 1. It is found that while the minimum value for interest rate on the informal credit is 'zero', the maximum value is found to be as high as 136.83 per cent per year in our study areas. Similarly, the interest rate that is charged on various groups of borrowers has not been uniform. The average rate of interest charged on the class of agricultural labourers has been quite low at nearly 12 per cent per year[6]. However, the same for marginal farmers is found to be 25 per cent and for the small farmers it is about 13 per cent. The group comprising the medium and large farmers has paid at an average rate of 10 per cent per year while borrowing from the informal lenders. For each of these groups, however, the difference between the maximum and minimum rates of interest has been quite substantial. This justifies the view that there exists considerable variation in rates of interest charged by the informal lenders in rural areas.

IV

DETERMINANTS OF INTEREST RATE FOR RURAL INFORMAL CREDIT

In this section, we discuss the issue of determination of interest rates in the case of rural informal loans. Our purpose here is to identify the set of factors that could explain variation in interest rates on informal loans in our sample areas. We employ the technique of multiple regression for this purpose. Before we present the regression results, it would be necessary to define the variables used in our multiple regression analysis.

Dependent Variable: The dependent variable in the multiple regression models is obviously the rate of interest charged on an informal loan contract. As is well known, the rate of interest for an informal loan could have two components - explicit and implicit (see Sarap, 1990, 1991; Reddy, 1992; Ghate *et al*, 1992). The explicit interest component of an informal loan is the rate of interest agreed upon by the lender and the borrower at the time of fixing the loan contract. However, apart from the explicit interest charges, the informal loans very often carry various implicit charges on the borrowers that need to be considered in order to obtain a full view of interest charged on informal loans. These implicit charges are particularly visible in the context of inter-linked loans (i.e., where the credit contract is linked with some other contracts such as land, labour, product and so on). We have computed these implicit interest charges for different types of inter-linked loans that have been added with explicit interest charges to obtain total interest for an informal loan. To reiterate our dependent variable, namely the rate of interest on an informal loan (per cent per year) is the sum of explicit and implicit interest charges in respect of the loan contract[7].

Independent Variables

Operated Area (OPAR): We view this as a determinant of interest rate in the event of a rural household borrowing from the informal lender(s). Large area under operation is reflective of better economic condition of the household. The household with larger operated area is also likely to enjoy better loan repayment capacity. It is then possible that the informal lenders, while doing business with these households, face lower risk of loan default. The rate of interest to be charged from these borrowers is likely to be low. We thus hypothesize an inverse relationship between the rate of interest on the informal loan and the size of area operated by the household.

Per Capita Income (PCI): Apart from operated area, we have considered per capita income as the other indicator of economic condition of the rural borrowers. Here again, we suppose that the households with higher per capita income enjoy greater capacity to repay the loans and hence there is lower risk of loan default from the point of view of the lenders. The rate of interest on an informal loan is thus likely to be low for the household with higher per capita income.

Caste Status (CASTE): The caste status of the households may be also an important determinant in the context of rural informal loans. The households of lower castes are likely to be also economically poor and hence they may be charged higher rates while borrowing from the informal market. We hypothesize an inverse relationship between caste status and rate of interest on the informal loans. The caste status of the households has been quantified by using a dummy variable that takes value 'one' for the households belonging to the category of lower castes / tribal and 'zero' for other households.

relationship between the rate of interest and OPAR, EDN, PURPOSE and REG is negative, the same with SOURCE, COLL, PERIOD and LINK is positive. It thus appears that the farmers with higher operated area, better education, higher per capita income and belonging to the advanced agricultural region pay lower rate of interest while borrowing in the informal credit market. However, when the borrowers depend on the moneylenders, offer marketable collateral, do not specify the period of loan and enter into inter-linked loan contracts, they bear higher interest charges on the loans obtained by them.

Region (REG): In a region characterized by advanced agricultural conditions (in terms of adoption of irrigation and other complementary inputs), the risk of agriculture (in terms of crop failure etc.) is low. In such a situation, the lenders face lower risks of loan default. Consequently, the rates of interest charged on informal loans are likely to be lower in the advanced areas than in the backward areas. To test the validity of this hypothesis, we have considered a region dummy which assumes value 'one' if the household belongs to an advanced village and 'zero' otherwise.

The Regression Results

The results of our multiple regression analyses have been presented in Table 2. We have run separate regressions for different rural classes, namely agricultural labourers, marginal and small farmers, medium and large farmers, all farmers and all households (which comprise all categories of farmers and the agricultural labourers). Again for each category, we have tried several regressions by considering different sets of explanatory variables. This was necessary because many of our explanatory variables exhibited strong correlation amongst themselves.

In the regression run for the category of agricultural labourers, we did not consider the variables such as OPAR, CASTE, PURPOSE and COLL. Since these households do not cultivate any land and all of them belong to the category of lower castes and tribal, it would not be appropriate to consider OPAR and CASTE as determinants of interest rates on informal loans for them. Similarly, we have not

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V

CONCLUSION

On the basis of our study, it may be concluded that there has been a multiplicity of factors determining the rate of interest in the market for rural informal credit. Thus, the rate of interest charged on the rural informal loan is significantly higher for the households who belong to an inferior socio-economic category (as reflected by smaller operated area, lower education and inferior caste position). It is also found that the rate of interest is very much dependent on the sources of loan. In particular, it is found to be significantly higher when the loans are obtained from village moneylenders. In our surveyed villages, the village moneylenders are the important suppliers of informal loans (nearly 25 per cent of total informal loan amount). In most cases, they offered loans as against some marketable collateral and also preferred to leave the loan duration unspecified. Such behaviour on their part is governed by the motive of maximising earnings from money lending. Consequently, our estimated regression models revealed that the rate of interest on the informal loan is significantly higher when the collateral offered is marketable and also the duration of loan being unspecified. To reiterate, this happened primarily because of domination and control exercised by the village moneylenders in rural areas[11]. We also found that the interest rate on informal loans in agriculturally advanced areas (where the risks of cultivation is low) is significantly lower as compared to the backward areas. This provided some support to the "lenders' risk hypothesis" as well.

NOTES

1) See for example, Bottomley (1963, 1975); Chandravarkar (1965); Kurup (1976); Bhaduri (1977, 1983); Borooah (1980); Basu (1984); Platteau (1985);

survey areas depend on the informal lenders for credit support. Further, among the informal lenders, village moneylenders are found to operate as strongly as other lenders such as traders and landlords.

6) The average interest rate charged on the agricultural labourers turns out to be low because their prime lenders have been the big cultivators who advanced loans as part of inter-linked contracts (credit-labour type) which did not carry exploitatively high interest rates. For more clarification, please refer to footnote 9 below.

7) For computation of explicit, implicit and total interest charges on an informal loan, we followed the methodology developed by Reddy (1992).

8) Such behaviour on the part of the lenders (village moneylenders in the present case) is not usually recognised in the existing empirical literature. However, in the context of their studies on rural labour markets in Palanpur village of Uttar Pradesh, Dreze and Mukherjee (1989, p. 236) observed 'town money lenders' charging very high rate of interest and yet demanding high value collateral (gold or silver) while advancing loans to the rural labour households.

9) This implies that the lenders while supplying inter-linked loans to the agricultural labourers have not done so with the motive of exploiting them through the instrument of inter-linkage. Our detailed investigation on the inter-linked contracts in the sample villages reveals that for the category of agricultural labourers, their prime lenders have been the 'big cultivators' (see Bhaumik and Rahim, 1999). Such lenders prefer to engage the agricultural labourers in inter-linked contracts merely as part of their labour-tying device (also see Bardhan, 1983; Bhaumik, 1993). This they do in order to ensure labour availability during peak agricultural seasons.

10) This is indicative of the monopoly power enjoyed by the village moneylenders that enable them to pursue the most exploitative form of money lending in the villages surveyed by us.

11) It is this feature of informal credit market that renders some of the existing hypotheses relating to interest rate determination for rural informal credit unacceptable in the context of our study areas.

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Table I : Extent of Variation in Interest Rate on Informal Loans

Category of Households	Interest rate charged on informal loans				
	Maximum	Minimum	Mean	S.D.	C.V. (S.D./Mean)
1	2	3	4	5	6
			ADVANCED VILLAGES		
AGL	96.00	0.00	8.22	20.72	2.52
MRF	136.83	0.00	18.09	30.18	1.67
SMF	120.00	0.00	10.99	21.62	1.97
MDF & LF	72.00	0.00	7.41	16.17	2.18
ALL	136.83	0.00	12.48	24.30	1.95
			BACKWARD VILLAGES		
AGL	120.00	0.00	14.98	24.72	1.65
MRF	120.00	0.00	31.69	38.11	1.20
SMF	120.00	0.00	10.99	21.62	1.97
MDF & LF	120.00	0.00	13.95	25.86	1.85
ALL	120.00	0.00	23.92	34.34	1.44
			ALL VILLAGES		
AGL	120.00	0.00	11.90	23.04	1.94
MRF	136.83	0.00	25.39	35.27	1.39
SMF	120.00	0.00	12.95	24.91	1.92
MDF & LF	120.00	0.00	10.10	20.88	2.07
ALL	136.83	0.00	17.58	29.73	1.69

Note : AGL = Agricultural labourers; MRF = Marginal farmers; SMF = Small farmers; MDF = Medium farmers; LF = Large farmers; and ALL = All households.

Source : Field survey.

Table II : Least Squares Regression Analysis of the Determinants of Interest Rates for Informal Loans in Surveyed Villages All Villages.

Explanatory variables	Estimated coefficients							
	Agricultural labourers		Marginal & Small farmers			Medium & Large farmers		
	Equn. 1	Equn. 2	Equn. 1	Equn. 2	Equn. 3	Equn. 1	Equn. 2	Equn. 3
1	2	3	4	5	6	7	8	9
Operated area (in acres)	–	–	–	-1.90** (-2.21)	-2.20* (-2.61)	–	0.36 (1.09)	0.35 (1.04)
Caste status (Lower caste and tribals = 1; Others = 0)	–	–	–	–	4.10*** (1.59)	–	–	-2.58 (-0.71)
Education (No. of years of schooling)	-1.79 (-1.22)	-1.37 (-1.09)	-1.24* (-3.96)	-0.77* (-2.90)	–	–	0.06 (0.24)	–
Per capita income (in Rs.)	-0.01 (-0.07)	-0.01 (-0.18)	-0.01 (-1.09)	-0.01** (-2.01)	-0.01* (-2.82)	0.01 (0.72)	-0.01 (-1.02)	-0.01 (-1.14)
Source of loan (Moneylenders = 1; Others = 0)	–	52.60* (4.14)	–	56.34* (22.26)	49.94* (14.00)	–	47.56* (16.05)	47.32* (15.87)
Purpose of loan (Production = 1; Others = 0)	–	–	–	-1.64 (-0.68)	–	–	-5.50** (-1.76)	-5.73** (-1.83)
Collateral (Marketable = 1; Others = 0)	–	–	21.26* (4.58)	–	–	12.99*** (1.54)	–	–
Period of loan (Unspecified = 1; Others = 0)	25.72*** (1.61)	–	34.77* (12.40)	–	7.21** (2.26)	23.29* (6.51)	–	–
Linkage (Linked loan = 1; Others = 0)	-28.14** (-1.74)	-20.82** (-1.81)	--	1.94 (0.89)	–	3.32 (0.70)	3.08 (1.09)	2.90 (1.08)
Loan size (in Rs.)	–	-0.01 (-0.59)	–	-6.88 (-0.40)	-0.01 (-0.70)	–	-1.63 (-0.06)	-3.88 (-0.15)
Region (Advanced = 1; Backward = 0)	-3.81 (-0.69)	–	-4.28*** (-1.63)	–	–	-3.16 (-1.02)	–	–
Intercept	39.51 (2.28)	31.39 (2.62)	17.78 (6.71)	20.03 (6.68)	15.24 (4.91)	1.76 (0.47)	6.25 (1.33)	7.65 (1.60)
R^2	0.28	0.43	0.40	0.57	0.57	0.34	0.69	0.69
F Value	5.39*	9.57*	57.96*	82.67*	95.28*	15.74*	44.53*	44.74*
No. of Observations	57	57	428	428	428	141	141	141

Table II (Continued)

Explanatory variables	Estimated coefficients						
	All farmers			All households			
	Equn. 1	Equn. 2	Equn. 3	Equn. 1	Equn. 2	Equn. 3	Equn. 4
1	10	11	12	13	14	15	16
Operated area	-0.67**	-0.50**	-0.64*	–	–	-0.42***	-0.47**
(in acres)	(-1.93)	(-1.71)	(-2.26)			(-1.51)	(-1.67)
Caste status	–	2.05	2.31	–	–	5.29*	4.63*
(Lower caste and tribals = 1; Others = 0)		(0.89)	(1.00)			(2.78)	(2.34)
Education	-0.91*	-0.73*	-0.76*	-0.94*	-0.60*	–	–
(No. of years of schooling)	(-3.64)	(-3.42)	(-3.58)	(-4.07)	(-3.02)		
Per capita income	-0.01***	–	–	-0.01**	-0.01*	-0.01*	-0.01*
(in Rs.)	(-1.45)			(-2.07)	(-2.98)	(-2.89)	(-2.61)
Source of loan	–	55.14*	49.85*	–	55.91*	50.65*	50.79*
(Moneylenders = 1; Others = 0)		(26.38)	(17.59)		(27.69)	(17.95)	(18.17)
Purpose of loan	–	-3.21***	–	–	-2.96**	–	–
(Production = 1; Others = 0)		(-1.61)			(-1.70)		
Collateral	20.05*	–	–	18.83*	–	–	–
(Marketable = 1; Others = 0)	(5.03)			(4.83)			
Period of loan	32.16*	–	6.49*	33.18*	–	6.31*	5.48**
(Unspecified = 1; Others = 0)	(13.96)		(2.66)	(14.88)		(2.55)	(2.29)
Linkage	–	2.33***	–	–	1.25	–	–
(Linked loan = 1; Others = 0)		(1.28)			(0.73)		
Loan size	–	-0.01	–	–	-8.79	-0.01	–
(in Rs.)		(-0.76)			(-0.62)	(-0.79)	
Region	–	–	-2.76***	–	–	–	-2.50***
(Advanced = 1; Backward = 0)			(-1.54)				(-1.46)
Intercept	15.68	14.11	13.30	13.99	15.61	9.80	11.13
	(7.17)	(5.06)	(5.59)	(7.26)	(7.11)	(4.89)	(4.97)
R^2	0.39	0.58	0.59	0.38	0.58	0.58	0.58
F Value	72.38*	114.83*	136.61*	95.24*	142.90*	143.34*	143.94*
No. of Observations	569	569	569	626	626	626	626

Note :* , ** and * indicate significance at 1, 5 and 10 per cent levels respectively.**

POVERTY ALLEVIATION PROGRAMMES IN WEST BENGAL : AN OVERVIEW

Dilip Kumar Ghosh*

Poverty is the worst menace of the human race. Many reduction strategies are adopted in our country for its alleviation. The present study deals with the case of West Bengal. Five major poverty alleviation programmes are studied here. The study reflects that in most of the programmes full utilization of the available funds was not possible. As regards the physical performance of the programmes, targets often remained unachieved. The share of wage employment programmes in total family income of the beneficiaries is also not very high, because potentialities of employment opportunities from these programmes are not fully utilized. In many cases attention is paid on capital intensive works instead of labour intensive works as set in programme guidelines. Women benefit in all the five programmes is not at par with the targets mentioned.

Poverty is perhaps the worst menace from which the human race has been suffering for a pretty long time inspite of many reduction strategies. In fact, poverty is a multifaceted complex phenomenon and requires all round attack for its reduction. In India direct attack on poverty started since the days of the Sixth Five year plan (1980 – 85) when various poverty alleviation programmes (both self and wage employment) were launched. According to the accepted views, poverty is said to exist in a given society when households and their members do not get a level of material well-being deemed to be reasonable. Considering the vastness of the problem, in the present study attempts are being made to reflect only the achievements of the major poverty alleviation programmes implemented in the rural areas. Before delving into the study it will be appropriate to present the poverty scenario in rural areas since the Sixth five-year plan period. The major States are only taken into consideration with a view to comparing West Bengal situation vis-à-vis other States (Table 1).

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Table 1: Percentage of people below poverty line in rural areas

Sl. No.	States Rank	1983-84	1987-88	1993-94	1999-2000	Absolut change		Percentage change
	Andhra Pradesh	26.53	20.92	15.92	11.05	15.48	58.35	5
	Assam	42.60	39.35	45.01	40.04	2.56	6.01	15
	Bihar	64.37	52.63	58.21	44.30	20.07	31.18	12
	Gujarat	29.80	28.67	22.18	13.17	16.63	55.80	6
	Haryana	20.56	16.22	28.02	8.27	12.29	59.78	3
	Karnataka	36.33	32.82	29.88	17.38	18.95	52.16	7
	Kerala	39.03	29.10	25.76	9.38	29.65	75.97	1
	Madhya Pradesh	48.90	41.92	40.64	37.06	11.84	24.21	14
	Maharashtra	45.23	40.78	37.93	23.72	21.51	47.56	10
	Orissa	67.53	57.64	49.72	48.01	19.52	28.90	13
	Punjab	13.20	12.60	11.95	6.35	6.85	51.89	8
	Rajasthan	33.50	33.21	26.46	13.74	19.76	58.98	4
	Tamil Nadu	53.99	45.80	32.48	20.55	33.44	61.94	2
	Uttar Pradesh	46.45	41.10	42.28	31.22	15.23	32.79	11
	West Bengal	63.05	48.30	40.80	31.85	31.20	49.48	9
	All-India	**45.65**	**39.09**	**37.27**	**27.09**	**18.56**	**40.67**	
Standard deviation		**16.05**	**13.02**	**12.71**	**14.01**			

Source: Planning Commission, Govt. of India.

From Table 1 it can be seen that maximum reduction in rural poverty occurred in Kerala and least in Assam during the period from the Sixth five year plan to mid-Ninth five year plan period (i.e. more or less eighteen years period). The States are ranked on the basis of rate of change in poverty during the period 1983 – 2000 and West Bengal stands at the 9th position.

In Table 1(a) the poverty ratios of scheduled castes and scheduled tribes over the two periods — 1983 - 1984 and 1999 - 2000 are presented. The poverty ratios of the major States show that in the States like Assam and Orissa the percentage of SC/ST people below poverty line has increased. In case of Bihar and Maharashtra, poverty ratio for the scheduled tribe people has increased marginally. However, the number of people below poverty line in respect of SC/ST community has decreased in most of the major States.

Table 1(a): Poverty Ratios among scheduled castes and scheduled tribes (figures in percentage)

Sl. No.	States	1983 - 84		1999 - 2000		Absolute change		Percentage change	
		SC	ST	SC	ST	SC	ST	SC	ST
	Andhra Pradesh	51.0	48.4	31.12	43.61	-19.88	-4.79	38.98	9.90
	Assam	21.9	25.5	40.09	43.85	+18.19	+18.35	83.06	71.96
	Bihar	71.1	64.9	64.58	65.07	-6.52	+0.17	9.17	0.26
	Gujarat	39.9	52.1	27.69	38.50	-12.21	-13.6	30.60	26.10
	Haryana	27.9	-	33.22	12.16	+5.32	-	19.07	-
	Karnataka	54.1	59.9	44.62	47.98	-9.48	-11.92	17.52	19.90
	Kerala	43.9	36.1	31.48	19.27	-12.42	-16.83	28.29	46.62
	Madhya Pradesh	55.9	58.7	53.13	59.26	-2.77	+0.56	4.95	0.95
	Maharashtra	59.3	67.1	41.38	47.68	-17.92	-19.42	30.22	28.94
	Orissa	54.9	68.9	58.69	72.97	+3.79	+4.07	6.90	5.91
	Punjab	21.8	15.4	18.85	14.12	-2.95	-1.28	13.53	8.31
	Rajasthan	44.9	63.7	28.10	26.43	-16.8	-37.27	37.42	58.51
	Tamil Nadu	59.4	50.9	46.32	49.96	-13.08	-0.94	22.02	1.85
	Uttar Pradesh	57.3	45.8	49.79	43.88	-7.51	-1.92	13.11	4.19
	West Bengal	62.0	58.6	38.64	54.32	-23.36	-4.28	37.68	7.30
	All-India	53.1	58.4	43.35	48.94	-9.75	-9.46	18.36	16.20

Source: For 1983-84 -> Basic Statistics relating to Indian Economy, Centre for Monitoring Indian Economy (September 1993) published in Rural Development Statistics, NIRD, 1999.
For 1999-2000 -> National Sample Survey Organization Report No. 469 on Employment and unemployment situation among social groups in India 1999-2000(55th round).

From Table 1(a) it can be noticed that the maximum reduction in poverty ratio among scheduled castes occurred in Andhra Pradesh (38.98 percent) followed by West Bengal (37.68 percent) and Rajasthan (37.42 percent). In case of tribal communities maximum percentage reduction occurred in Rajasthan (58.51 percent) followed by Kerala (46.62 percent) and Madhya Pradesh (28.94 percent).

Thus, eradication of poverty still remains a major challenge for planned economic development, though poverty had declined substantially during the period. In view of the enormity of the problem it is the fact that all round attack is a pre-requisite for poverty reduction. On one hand, entitlements of the poor need to be

year plan the performance of the State was equally unsatisfactory – out of Rs. 11725 lakhs only Rs. 5354.87 lakhs were spent (in percentage term only 45.67 percent). However, the situation drastically changed during the Seventh five year plan when it became possible to reach both physical and financial targets with convincing margin. Out of the target of assisting 10,92,751 families, 13,98,215 families were assisted during the Seventh plan. In the financial sector Rs. 25026 lakhs were spent against the target of Rs. 23670.19 lakhs. In percentage term, thus, physical achievement was to the tune of 127.95 percent and financial achievement 105.73 percent. In Table 2, the physical and financial performances of the State during 1990-91 to 1998-99 are given.

Table 2: Physical and financial performance in IRDP

Year	Physical target	No. of families assisted	Percentage coverage	Amount of available fund (Rs. in lakhs)	Expenditure (Rs. in lakhs)	Financial achievement (in percent)
1990 – 91	195663	226603	115.81	6155.20	6588.96	107.04
1991 – 92	185332	201476	108.71	5791.64	6591.99	113.82
1992 – 93	154457	171695	111.16	5788.00	5997.11	103.61
1993 – 94	182836	73818	40.37	7542.00	3155.00	41.83
1994 - 95	149552	159722	106.80	7478.00	6106.76	81.66
1995 – 96	-	161724	-	7472.20	6592.54	88.23
1996 – 97	-	110280	-	7472.20	5380.89	72.01
1997 – 98	-	91733	-	10597.05	4778.49	45.09
1998 - 99	-	71134	-	9652.12	4264.22	44.18

Source : Panchayats and Rural Development Department, Govt. . Of West Bengal and Basic Rural Statistics, MORD, Govt. Of India, 1999.

From the table 2 it can be noticed that in the year 1993-94 the performance of the State was the lowest. This was mainly due to introduction of some procedural change in releasing IRDP subsidy. Before 1993-94, DRDAs used to release advance cheques of subsidy to individual bank branches against their claims. But instead of making disbursement within 90 days (the stipulated time frame for completing disbursement) the common practice among the bankers was not to disburse timely but to withhold the released subsidy and thereby resulting in accumulation of crores of subsidy in different bank branches. In the newly introduced procedure bank branches would have to disburse the project cost of the scheme (s) first out of their own fund and then to claim reimbursement of subsidies from respective link branches

where DRDAs kept subsidies. This newly introduced method helped to reduce holding of subsidies at bank branch level. After 1993-94 performance improved but at a slow pace. From the year 1995-96, Govt. of India has dispensed with the system of fixing physical target. The matter was left to the district authorities for fixing their own target and disaggregating it to block level. For this reason in Table 2 no physical target is shown since 1995-96.

The coverage of assistance in favour of the scheduled caste/scheduled tribe and women is given In Table 3. Out of nine years considered for the study in five years it was not possible to achieve the target of women coverage. In the districts also wide variations in women coverage may be noticed.

Table 3: Scheduled caste/ scheduled tribe and women coverage (figures in percentage)

Year	SC/ST coverage	Women coverage	Shortfall/ excess in coverage	
			SC/St	Women
1990 – 91	42.17	42.39	-7.83	+2.39
1991 – 92	41.88	42.13	-8.12	+2.13
1992 – 93	40.85	44.83	-9.15	+4.83
1993 – 94	40.87	38.07	-9.13	-1.93
1994 - 95	43.90	39.20	-6.10	-0.80
1995 – 96	40.44	38.72	-9.56	-1.28
1996 – 97	38.93	40.04	-11.07	+0.04
1997 – 98	37.43	37.25	-12.57	-2.75
1998 - 99	37.60	34.78	-12.40	-5.22

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

From the table 3 it can be seen that the coverage of the marginalised sections is far short of the target set in the guidelines. This may be due to insensitive attitude of the programme implementing agencies starting from the panchayat to DRDA at the district level. In West Bengal, panchayat bodies at the block and the village level are mainly responsible for identification of the beneficiaries. As regards the assistance of women, the guidelines prescribed that, if necessary, along with the male member being assisted the female member would also be assisted so as to increase women coverage, on one hand and making family scheme ratio at least 2, on the other. IRDP guidelines prescribed that any scheme of primary, secondary and tertiary sector could be given to beneficiaries on the basis of their choice and necessary viability. In the table 4 composition of schemes and the family scheme ratio for each year are given.

	Rs. 6839	Rs. 6445	Rs. 8371
State Minimum value	Arunachal Pradesh	Goa	Sikkim
	Rs. 936	Rs. 1200	Rs. 973
West Bengal	Rs. 1646	Rs. 2107	Rs. 2538
All-India	Rs. 1903	Rs. 2962	Rs. 3328

Source : Fifth Concurrent Evaluation Report.

(a) Impact on occupation

The Fifth concurrent evaluation report categorised beneficiaries (both new and old) into four categories to get their response in respect of change in occupation due to assistance under IRDP. According to Fifth concurrent evaluation old beneficiaries are those beneficiaries who received IRDP assistance during any time on or before the 31st March 1994 (that is till the year 1993-94) and new beneficiaries are those who were assisted since April 1994 and till the date of the survey. In the table 6 responses of the beneficiaries regarding impact of IRDP are given.

Table 6 : Percentage of old and new beneficiaries reporting change in occupation

Category of beneficiaries	West Bengal		All-India	
	Old	New	Old	New
A. Beneficiaries who continue to have same occupation after getting benefit under IRDP	76.28	78.11	85.31	80.40
B. Beneficiaries who changed their occupation				
1. Due to participation in IROP	74.04	90.28	80.85	96.10
2. Beneficiaries who changed their occupation due to other reasons	21.79	4.17	18.21	3.42
3. Not reported	4.17	4.17	0.85	0.42

Source : Fifth Concurrent Evaluation Report, MORD, Govt. of India.

From the table 6 it can be seen that of the old beneficiaries in West Bengal 76.28 percent reported continuation of their same occupation even after receiving assistance under IRDP. In West Bengal the situation is slightly better because at all-India level in the case of old beneficiaries only 14.69 (100 - 85.31) percent and in the case of new beneficiaries only 19.60 (100 - 80.40) percent reported changes in their occupation.

(b) Impact on income

The Fifth concurrent evaluation report provided information on net income

From the table 8 it can be seen that in West Bengal, taking all sub-group of poor together, the share of income from IRDP scheme in total income of the beneficiary households is found to be around one fourth while it is around one fifth at all-India level. The general trend that may be noticed from the table 8 indicates that IRDP has little impact on the income pool of the poorer households because higher the income group more is the share of IRDP scheme in total income of the households. This practically contradicts the basic objective of IRDP, that is putting the last first through income augmentation of the poorest.

As regards the families crossing poverty line, the Fifth concurrent evaluation report provides information in respect of two poverty lines e.g. Rs. 6400 per annum and Rs. 11000 per annum. The beneficiaries were categorised on the basis of the nature of the schemes provided to them and the age of assets delivered to the beneficiaries. The age of a scheme is measured by the time gap between the assistance

From the table 9 it can be observed that in West Bengal, percentage of families crossing poverty line are always less than all-India figures irrespective of sectors and poverty line. Higher the age of the IRDP asset more are the chances that the beneficiaries would cross the poverty line. Higher age indicates retention of the IRDP assets by the beneficiaries for a longer time. Of three sectors, in secondary sector number of families crossing poverty line is the lowest while in tertiary sector this proportion is the highest. For more income generation it is necessary that there should be some coordination and integration of various developmental schemes. The secondary sector failure is mainly due to lack of skill development and marketing support. On the other hand, success of tertiary sector depends more on the initiative and entrepreneurial ability of the beneficiary concerned. Therefore, the income impact of IRDP is not that much significant because taking all three sectors together in West Bengal only 59.27 percent beneficiaries crossed poverty line of Rs. 6400 per annum, as against all-India average of 82.84 percent. In respect of the poverty line of Rs. 11,000/- per annum, in West Bengal (taking all three sectors together)only 18.98 percent beneficiaries crossed the poverty line whereas at all-India level the corresponding percentage is 43.81 percent.

It is obviously a fact that IRDP alone cannot cure all ills. Convergence of other poverty alleviation programmes with IRDP is very much expected. The Fifth round concurrent evaluation report collected information on this issue. The result is presented in Table 10.

Table 10: Percentage distribution of IRDP beneficiaries receiving assistance from other programmes (figures in percentage)

Sl. No.	Name of programme in which assistance was given	West Bengal	All-India	Maximum value state
1.	Jawahar Rozgar Yojana	2.29	6.35	Arunachal Pradesh 15.83
2.	Training of Rural Youth for self employment	0.24	0.69	Sikkim 8.00
3.	Development of women and children in rural areas	0.65	0.42	Sikkim 15.00
4.	Indira Awas Yojana	1.06	3.50	Tamil Nadu 11.64
5.	Backward Areas Programme	0.00	0.26	Sikkim 18.00
6.	Others	2.47	4.07	Sikkim 45.00
7.	No assistance from other schemes	93.24	84.67	Jammu and Kashmir 99.57

Source: Fifth Concurrent Evaluation Report.

From the table 10 it is seen that the poverty alleviation programmes in West Bengal are being implemented without any coordination and convergence in between though at the district level District Rural Development Agency is the administrative agency for implementing self-employment programmes. But at the sub-district level (at block level) panchayat samiti is the only agency for implementing all poverty alleviation programmes (both self and wage employment). At the village level gram panchayats are entrusted with the implementation of these programmes. But it is unfortunate that no coordination mechanism works. The benefits of different schemes do not converge on a single family so that this family can go beyond poverty barrier on a sustainable basis. In Table 10 percentages in maximum value State is also given for having a comparative view. For example, though skill development is an essential input for generating more income, in West Bengal least convergence may be noticed in this respect – only 0.24 percent IRDP beneficiaries received assistance under TRYSEM – whereas in the case of Sikkim this percentage is 8 percent. Similar is the case of DWCRA where there was ample scope for enhancing women development. Both in West Bengal and India as revealed from Table 10 very few women beneficiaries who received IRDP assistance were brought under DWCRA. It is a realised fact that the implementation of programmes in isolation cannot deliver the goods necessary for poverty amelioration.

TRYSEM

Training of Rural Youth for Self Employment is an intervention by the State in enhancing the productive potential of the poor people. The scheme was introduced in the year 1979 with the objective to provide basic technical and entrepreneurial skills to the rural youth of below poverty line families so that they would take up self-employment programme in the post training stage. But from the year 1983 taking up of wage employment was also included in the agenda. For safeguarding the interests of the marginalised sections, TRYSEM guidelines provided that a minimum of 50 percent of trained youth should be from SC/ST communities and a minimum of 40 percent of youths trained should be women while 3 percent reservation would be kept for physically handicapped persons. In Table 11 physical and financial performance during the period 1990-91 to 1998-99 is given.

Table 11: Physical and financial performance in West Bengal

Year	Physical target	No. of youths trained	Amount of available funds (Rs. in lakhs)	Total expenditure (Rs. in lakhs)	SC/ST coverage (in percentage)	Women coverage (in percentage)
1990 - 91	13640	14916 (109.35)	-	191.75	38.89	44.93
1991 - 92	14780	17828 (120.62)	-	276.06	43.16	49.47
1992 - 93	16400	15223 (92.82)	-	316.37	37.60	51.16
1993 - 94	24115	17421 (72.24)	-	282.70	31.78	46.29
1994 - 95	21922	20711 (94.47)	-	448.91	34.87	45.18
1995 - 96	23704	22557 (95.16)	745.90	644.97 (86.47)	31.34	45.00
1996 - 97	21485	24269 (112.96)	380.73	645.20 (169.46)	27.64	48.36
1997 - 98	23560	19970 (84.76)	424.24	486.06 (114.57)	28.59	47.87
1998 - 99	19630	12673 (64.55)	549.01	471.12 (85.81)	34.87	57.73

Source : Panchayats and Rural Development, Govt. . Of West Bengal .
Note : Percentage figures in brackets.

From the Table 11 it can be seen that during nine years, the total amount of expenditure was Rs. 3763.14 lakhs for training of 1,65,568 rural youths, that is, the per youth expenditure was around Rs. 2273. This expenditure included honorarium for the trainers, stipend for the trainees and raw materials during the training period. Till 1994-95, TRYSEM was a component of IRDP and there was no separate budgetary head. But since 1995-96 separate budgetary head was created for TRYSEM. Due to this reason for the period 1990-91 to 1994-95 no separate data in respect of available fund for TRYSEM were available.

Post-training rehabilitation is the most important aspect of the programme. This employment may be self-employment or wage employment. In the 8th five-year plan emphasis was placed on assistance under IRDP for the trained rural youths.

In the table 12 year-wise post-training rehabilitation of the rural youths is presented. As the DRDA, block panchayat and village panchayat are the main actors in implementation of TRYSEM and IRDP it is expected that rehabilitation will be in high order.

Table 12: Employment of Trained youths (figures in percentage)

Year	Youths self employed	Youths wage employed	Youths assisted under IRDP
1990 - 91	54.27	14.63	-
1991 - 92	56.22	16.53	-
1992 - 93	58.54	30.82	51.49
1993 - 94	36.96	12.70	31.71
1994 - 95	34.77	13.61	29.05
1995 - 96	35.82	9.58	27.31
1996 - 97	34.69	12.73	19.61
1997 - 98	36.01	11.73	14.71

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

From the table 12 it can be seen that in both self employment and wage employment settlements of trained youths are not very high. TRYSEM-trained youths preferred self employment to wage employment. According to the guidelines, TRYSEM-trained youths should be provided with assistance under IRDP. But Table 12 tells a different story.

For getting an idea about the strength and weakness of this programme, the Ministry of Rural Development, Govt. of India, sponsored a countrywide quick evaluation study through ORG centre for Social Research, New Delhi. In the present study some reflections from this sponsored study (ORG Study) are made to assess the impact of the programme and its implementation. This part starts with employment status of TRYSEM beneficiaries wherefrom it can be seen that in this front achievement in West Bengal is not encouraging.

Employment status

The evaluation study found that small percentage of TRYSEM beneficiaries were found to be employed in the skills imparted through TRYSEM. In Table 13 impact of TRYSEM on employment is presented.

Table 13: Employment status of TRYSEM trained youths (in percentage)

Sl. No.	Status	West Bengal	All-India		Maximum value state	Minimum value state
1.	Employment in skills learnt through TRYSEM	1.82	5.41		Sikkim 39.05	Goa 0.00
2.	Self employed in TRYSEM skills	5.86	14.65		Nagaland 63.50	Goa 0.00
3.	Employed in other skills	21.21	23.84		Rajasthan 60.87	Goa 0.00
4.	Unemployed	71.11	54.55		Goa 100.00	Nagaland 21.90

Source : ORG Study.

From the table 13 it can be seen that the linkage of training with employment is very inadequate in most of the States. From the evaluation study it may be noticed that employment in skills learnt through TRYSEM is found to be only 7.68 percent of the total youths trained.

On completion of training the trained youths are supposed to get toolkits for continuation of their skills in the same trade in which they were trained. The evaluation study reflected that majority of the trained youths did not get toolkits (Table 14).

Table 14: Receipt of toolkits (percentage of beneficiaries)

Status	West Bengal	All-India	Maximum value state	Minimum value state
Received	23.23	29.73	Arunachal Pradesh 90.16	Assam 1.25
Did not receive	76.57	68.55	Assam 98.75	Arunachal Pradesh 9.84

Source : ORG Study.

From the table it can be seen that in West Bengal number of youths in percentage receiving toolkits was less than the all-India average. The situation is the worst in Assam and the best in Arunachal Pradesh. Even the involvement of the gram panchayats and the panchayat samitis did not bring about any significant achievement in this aspect. In West Bengal the panchayat bodies at village and block level organize different meetings and discussions with the villagers for making poor people aware of the programmes.

According to the study, in West Bengal 65.34 percent TRYSEM beneficiaries approached panchayat bodies for post-training employment. The other agencies to whom the beneficiaries approached are district/ block level functionaries, employment agency, contractor, non-government organizations/ institutions. In Table 15 responses of the beneficiaries regarding the nature of efforts made to seek employment after training are given. From the responses of the beneficiaries (Table 15) it can be seen that though at all-India level a sizeable number of trained youths did not make any approach for getting employment, in West Bengal this is minimum.

Table 15: Nature of efforts make to seek employment after training (figures in percentage)

Sl. No.	Agencies approached	West Bengal	All-India	Difference (India – West Bengal)
1.	District/ Block functionaries	39.77	36.68	-3.09
2.	Sarpanch	65.34	27.04	-38.30
3.	Contractor/ agent	7.10	6.71	-0.39
4.	Employment Agency	11.65	12.85	+1.2
5.	Applied for loan	64.49	25.23	-39.26
6.	NGO/ institution	5.68	8.55	+2.87
7.	Made no approach	1.99	27.21	+25.22

Source : ORG Study.

From Table 15 it is further seen that in comparison to all-India average in West Bengal involvement of NGO is less and the rural poor prefer panchayat bodies to any other agencies.

DWCRA

Development of Women and Children in Rural Areas programme was initiated on pilot basis in 50 districts of the country. The general approach that has been conceptualised is to give strength to the women in need of development through bringing them together in small groups. While IRDP approach was individualistic, in DWCRA group approach was accepted. Two main objectives of the programme were, first to organise women for self employment and second, to provide social strength to women in rural areas. In West Bengal the programme was started on pilot basis in two districts, viz., Bankura and Purulia in the year 1983-84. Since 1994-95 all the districts of the States were brought under the programme. In fact, in

West Bengal DWCRA programme was expanded in a phased manner. In Table 16 physical and financial performance of the State during 1990-91 to 1998-99 are presented.

Table 16: Physical and financial performance in DWCRA

Year	Target for group formation	Groups formed	Physical achievement (in percentage)	Fund available (Rs. in lakh)	Expenditure (Rs. in lakh)	Financial achievement (in percentage)	SC/ST coverage (in percentage)
1990 - 91	340	405	119.11	50.85	55.71	109.56	42.71
1991 - 92	400	403	100.75	37.48	56.39	150.45	46.37
1992 - 93	300	345	115.00	59.92	37.48	62.55	51.47
1993 - 94	350	290	82.86	48.63	38.91	80.01	34.51
1994 - 95	756	381	50.40	99.00	43.62	44.06	47.54
1995 - 96	1806	888	49.17	251.15	56.71	22.58	38.74
1996 - 97	1806	1758	97.34	312.67	131.70	42.12	45.23
1997 - 98	1806	1986	109.96	424.71	142.91	33.65	45.60
1998 - 99	1950	1920	98.46	532.93	203.88	38.26	39.37

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

From the table 16 it can be seen that in the initial two years full achievement in respect of physical target (number of groups to be formed) and available funds was possible. But thereafter it was rarely possible to achieve full target both in terms of physical number and expenditure. For low level of utilisation of fund from 1994-95 to 1998-99 (the last year of the programme) no central and state shares were released for many districts in the State. For example, in 1994-95 these two shares were not released for 10 districts, in 1996-97 for 9 districts, in 1997-98 for 6 districts and in 1998-99 for 8 districts (Panchayat and Rural Development Department, Govt. of West Bengal). The major defaulting districts where central and state shares were not released for three consecutive years are Cooch Behar, Uttar and Dakshin Dinajpur, South 24 Parganas and Murshidabad.

In DWCRA programme it was expected that all groups formed would undertake income generating activities for the benefits of their group members. These economic activities included activities like rice processing, jari works (mainly in Hooghly), belmala making (in Bankura), sericulture (in Purulia) etc. In Table 17 proportion of groups undertaking income generating activities (IGA) and per group expenditure for this purpose are given so as to have an idea how far DWCRA contributed towards economic empowerment of poor women in the rural areas.

Table 17: Income generating activities in DWCRA

Year	IGA groups (in percentage)	Proportion of members benefitted (in percentage)	Per group average expenditure (in Rupees)	Per member availability of fund (in Rupees)
1990 - 91	65.18	65.92	20708	1150
1991 - 92	58.06	74.94	23850	1703
1992 - 93	60.87	57.36	17482	1248
1993 - 94	82.07	82.98	15876	1157
1994 - 95	92.12	84.42	12239	874
1995 - 96	63.85	62.68	9613	769
1996 - 97	47.61	46.13	15383	1225
1997 - 98	75.98	78.35	9168	685
1998 - 99	49.89	48.71	20487	1595

Source : Planning Commission, Govt. of India

In West Bengal, though large number of groups were formed, it was not possible to involve all of them in income generating activities. For this reason a sizeable number of poor women remain outside the orbit of benefits of this programme even after becoming member of DWCRA groups. The average size of a DWCRA group varies between 15-20 members. The per group expenditure in Table 18 indicates low scale activities because, on an average, per member availability of fund in a year is found to be around only Rs. 1156. As a result, only traditional schemes were pursued by DWCRA groups yielding low income – in one sense this is a case of frustrating programme objectives. Even where groups were brought under income generating activities there remained the possibility that all members were not covered – these might be the cases where IGA group coverage was greater than member-benefited coverage.

For making assessment of the programme, MORD, Govt. of India sponsored a quick evaluation study of DWCRA through Wizmin Management Consultants, Kanpur. In the present study some results of this evaluation study are used for presenting the impact of the programme. According to the evaluation study, in West Bengal DWCRA groups pursued a large variety of activities mostly of traditional type. For example, 65.3 percent groups undertook primary sector activities, 13.7 percent groups were engaged in secondary sector (mainly textiles, handicrafts and tailoring) and remaining 21 percent in tertiary sector. The picture, however, is slightly different at all-India level where 55.6 percent groups were engaged in primary sector,

30.8 percent in secondary sector and 13.6 percent in tertiary sector. More engagement in secondary sector indicates diversification in activities. The participation of beneficiaries in project selection is minimum, though, according to DWCRA guidelines, the selection of activity should be left to group members and they should not even get the impression that 'activity is imposed upon them against their wishes'. According to the evaluation study, in West Bengal only 24.1 percent groups responded that activities were selected by them.

Impact of the programme

The quick evaluation study collected information regarding perception of beneficiaries (both groups leaders and members) about the economic and social impact of the programme. The distribution of the responses is given In Table 18.

Table 18 : Impact of DWCRA (figures in percentage)

Sl. No.	Items	Group leaders		Beneficiaries	
		West Bengal	All-India	West Bengal	All-India
1.	Greater desire for self employment	96.1	93.9	99.2	92.5
2.	Bring women together to work in groups	98.7	91.7	99.5	92.3
3.	Increase in savings	93.4	81.1	89.6	71.9
4.	Better health	81.6	64.8	77.4	52.5
5.	Better education for children	71.1	64.9	63.9	55.4
6.	Safe drinking water	51.3	50.2	39.0	45.3
7.	Better sanitation	47.4	36.1	39.3	33.2
8.	Better nutrition	65.8	52.4	68.2	48.6
9.	Better economic condition	72.4	78.5	70.2	74.1
10.	Improved social prestige	67.1	73.5	59.7	68.0
11.	Increase in income	X	X	96.5	88.8

Source : Quick evaluation study of Development of women and children in rural areas sponsored by MORD, Govt. of India, December 2000.

From the perceptions of the group leaders and beneficiaries it can be noticed that the impact of employment and group activities for bringing women together is very high. The perception of the beneficiaries regarding impact on economic condition and savings is also high. But in respect of social development the impact of DWCRA is found to be very discouraging – small number of beneficiaries responded positively regarding the impact on better health, better education for children, safe drinking water, better sanitation and better nutrition. This indicates that impact of DWCRA is more perceptible in economic uplift of women.

Jawahar Rozgar Yojana

Jawahar Rozgar Yojana (JRY) was launched with effect from the I[st] April, 1989 by merging two existing wage employment programmes, viz., National Rural Employment Programme (NREP) and Rural Landless Employment Guarantee Programme (RLEGP). JRY has two objectives (i) to generate additional gainful employment for unemployed and underemployed persons in the rural areas and (ii) to create durable community and social assets. Year-wise achievement of financial target (measured as percentage of expenditure vis-à-vis total available funds) and employment generation target are given in Table 19.

Table 19 : Expenditure and Employment generation in JRY

Year	Total available fund (Rs. in lakh)	Total expenditure (Rs. in lakh)	Percentage of utilisation	Man days generation target (in lakhs)	Employment generation (in lakh man days)	Percentage achievement
1990 – 91	28428.52	17019.09	59.87	643.16	516.85	80.36
1991 – 92	24099.73	19342.16	80.26	544.08	491.99	90.43
1992 – 93	25299.74	21412.74	84.64	557.24	525.55	94.31
1993 – 94	28162.98	24151.55	85.76	563.81	497.32	88.21
1994 - 95	29228.12	25094.46	85.86	498.98	489.37	98.07
1995 – 96	34618.78	26165.80	75.58	422.28	366.69	86.83
1996 – 97	18764.54	12837.59	68.41	221.87	178.53	80.47
1997 – 98	17334.24	12404.99	71.56	-	154.62	-
1998 - 99	18611.99	12604.35	67.72	-	137.41	-

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

For protecting the interests of weaker sections in JRY there was provision for reservation of employment generation for scheduled castes/ scheduled tribe and women. According to JRY guidelines, at least 30 percent of employment was to be reserved for women and 22.5 percent of funds to be reserved for individual beneficiary oriented schemes for the benefit of SC/ST communities. In West Bengal the target of 30 percent women coverage was rarely achieved. For example, in total employment generation women share was 25.66 percent in 1997-98 and 23.34 percent in 1998-99.

For studying the impact of the programme, MORD, Govt. of India sponsored a quick evaluation study of the programme through International Institute for Sustainable Development and Management (IISDM), Ahmedabad. In the present

study the results of the evaluation study are used to present the impact of JRY in West Bengal.

Asset creation

One positive aspect of the programme was that it became successful in creating durable community assets in rural areas (Mid-term Appraisal, Ninth FYP). The evaluation study classified works/ assets created in JRY under broad five categories. These are : (a) rural roads, (b) water supply and irrigation, (c) land development, (d) construction of social and other buildings and (e) social and farm forestry. The evaluation study found that in all three levels of implementation (district, block and gram panchayat) rural roads received high priority. The evaluation study observes that across the States there are variations in works/ assets. Table 20 shows the number of works in maximum value States and minimum value States vis-à-vis that for West Bengal and India.

Table 20 : Number of work/ assets created in JRY

Location	West Bengal	All-India	Maximum value state	Minimum value state
Per district no. of	4.75	8.12	Meghalaya	Tamil Nadu
work/ assets			19.5	1.20
Per block no. of	7.32	7.45	Assam	Goa
work/ assets			16.54	0.50
Per gram panchayat	6.95	6.38	Orissa	Meghalaya
no. of works/ assets			12.52	0.32

Source : IISDM Study.

From Table 20 it is seen that in West Bengal maximum assets are created at the middle tier of the panchayat structure. In West Bengal the panchayat bodies are involved in planning and implementation of Jawahar Rozgar Yojana. IISDM study also reflected the wide involvement of panchayats in preparation of action plan. According to the study, in West Bengal Gram Sabha is involved in 79 percent cases of preparation of action plan of JRY while at all-India level this involvement is to the tune of 68 percent. Involvement of the panchayat in fact contributed to better awareness of the beneficiaries in respect of the prevailing minimum wages. IISDM Study shows that in West Bengal 85 percent beneficiaries are aware of their minimum wages while in Uttar Pradesh this figure is 63 percent and in Bihar 68 percent.

Wage payment

In West Bengal wage payment is better than all-India situation because in most of the cases wages are paid daily and on the site. IISDM study identifies five types of periodicity. These are (a) daily, (b) weekly, (c) fortnightly, (d) monthly and (e) more than monthly. As regards the location of wage payment JRY guidelines suggest that preference should be given for on site-payment.

Table 21 presents wage payment scenario in JRY as avaialable from IISDM study. From the evaluation study it can be seen that there are no cases of monthly or more than monthly payment in JRY. In quick evaluation study three wage payment agencies are identified – (a) village officials, (b) block officials and (c) contractors.

Table 21: Wage payment scenario in JRY (all figures in percentage)

Item	West Bengal	All-India	Difference (India – West Bengal)
I. Wage payment periodically			
(a) Daily	70	27	-43
(b) Weekly	29	57	+28
(c) Fortnightly	1	6	+5
(d) Monthly	0	7	+7
(e) More than monthly	0	3	+3
II. Location of wage payment			
(a) On site	98	65	-33
(b) Off site	2	35	+33
III. Wage payment agencies			
(a) Village officials	98	73	-23
(b) Block officials	1	7	+6
(c) Contractor	1	20	+19

Source : IISDM Study.

Table 21 shows that at all-India level there are large number of cases where contractors are being the agent for wage payment. This is against the guidelines of JRY. Involvement of the panchayat bodies in implementation of JRY in West Bengal makes wage payment more or less free from any aberrations from the programme guidelines.

Share of JRY wage in family income

The quick evaluation study collected information on income contribution of JRY in total pool of family income. Per annum family income is categorised into six categories and distribution of beneficiaries is made according to their responses. Table 22 presents family income-wise (income from JRY) distribution of beneficiaries in percentage.

Table 22 : Income contribution of JRY (in percentage)

Range of annual contribution to family income	West Bengal	All-India	Difference in percentage point (India – West Bengal)
Up to Rs. 300	5	16	+11
Rs. 301 – 501	19	28	+9
Rs. 501 – 1000	30	30	0
Rs. 1001 – 2500	39	18	-21
Rs. 2501 – 5000	7	5	-2
Above Rs. 5000	0	2	+2

Source : IISDM Study.

From Table 22 it can be seen that for 54 percent of the beneficiaries in West Bengal, the contribution of JRY in the total pool of per annum family income is to the tune of Rs. 1000 only whereas at all-India level the corresponding figure is 74 percent. During the survey by IISDM the prevailing wage rate was Rs. 50 per day. Therefore, income of Rs. 1000 from JRY in a year means maximum 20 days of employment from JRY works. In this way, minimum 6 days of employment was received by 5 percent of JRY beneficiaries in West Bengal and in no case 100 days of employment in a year could be guaranteed for a family in West Bengal. The majority of the beneficiaries received 6 to 20 days employment in West Bengal. Only 39 percent beneficiaries in West Bengal received employment in the range 20 to 50 days in West Bengal. In contrast, at all-India level 74 percent beneficiaries received employment in the range of 6 to 20 days and only 18 percent received employment of 20 to 50 days in JRY.

Employment Assurance Scheme

From the 2nd October, 1993 EAS was launched in 1752 identified backward blocks of 257 districts where the revamped public distribution system was in vogue.

Subsequently, the scheme was extended to all blocks of the country in April 1997. The main objective of the programme is "that those who are in need and are seeking employment will get assured wage employment to 100 days during the lean agricultural seasons." According to EAS guidelines, the scheme is open to all rural people residing in the area and lying below poverty line. As EAS is a centrally sponsored scheme the expenditure is shared between the centre and the States in the ratio of 80:20. The secondary objective of the programme is the construction of economic infrastructure and community assets for sustained employment and development. Like JRY in EAS also emphasis has been placed on labour intensive work. According to EAS guidelines labour intensive works are those works "which have a ratio of wages of unskilled labour to equipment, material and other skilled work of not less than 60 : 40". In West Bengal EAS was launched in phased manner since the year 1993 – 94 when in 129 blocks out of 341 the programme was started. From the year 1997-98 all the blocks of the State were brought under the scheme. In Table 23 expenditure and employment generation in EAS since 1993-94 are given.

Table 23 : Expenditure and Employment generation in EAS

Year	Total available fund (Rs. in Lakhs)	Expenditure (Rs. in Lakhs)	Percentage of utilisation	Employment generation (in lakh)
1993-94	4931.25	2914.94	59.11	57.70
1994-95	11741.31	9220.72	78.53	184.79
1995-96	15812.63	9856.21	62.33	143.08
1996-97	18730.06	10805.10	57.69	162.76
1997-98	17953.21	11411.40	63.56	139.44
1998-99	17519.62	10031.17	57.26	106.37
1999-2000	20913.99	11109.54	53.12	103.90

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

As EAS is a demand-driven employment generation programme, no target for employment generation is fixed. The financial achievement (presented In Table 23 as percentage utilisation of available fund) In Table 23 shows that in no year it was possible to utilize the available fund fully. Maintenance of wage – non-wage ratio is very crucial for the success of the programme because without labour intensive schemes it would not possible to achieve huge employment generation.

According to available information, in West Bengal share of wage component in total expenditure was 59.81 percent in 1995-96, 57 percent in 1996-97, 59.02

percent in 1997-98, 54.28 percent in 1998-99 and 55.57 percent in 1999-2000. This indicates that in the last five years the 60:40 ratio between wage component and non-wage component was not followed. Across districts there exist wide variations also. For example, a review by the Department of Panchayats and Rural Development, Govt. of West Bengal, observed that Burdwan, Midnapore, North 24 Parganas, Malda and Cooch Behar district spent more than 50 percent on non-wage component.

As regards the protection of interests of women, in EAS guidelines there is no specific reservation for women. According to the guidelines of the programme all poor in the rural areas in need of employment constitute the target group of the programme. However, preference may be given to BPL scheduled caste/ tribe families and parents of child labour withdrawn from hazardous occupations. In Table 24 year-wise share of women, scheduled caste, scheduled tribe and landless in employment generation during the period 1995-96 to 1999-2000 are given.

Table 24: Share in employment generation (in percentage)

Year	Women	Scheduled caste	Scheduled tribe	Landless
1995 – 96	29.03	36.37	20.29	61.51
1996 – 97	27.92	38.08	20.60	61.81
1997 – 98	26.20	39.08	19.38	63.64
1998 - 99	19.31	34.45	14.50	49.95
1999 - 2000	NA	36.98	15.75	NA

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

The major evaluation work of this scheme was done by Programme Evaluation Organisation (PEO) of the Planning Commission for assessing the performance, appropriateness of implementation of the programme and impact of the programme. The PEO Study covered the reference period of four years from 1993-94 to 1996-97 and covered 14 major States of the country.

Employment generation

PEO study collected information on the number of days for which employment was received by the respondents during the period under the study. The distribution of respondents is given on the basis of the availability of employment. The employment availability is distributed on four categories and the result is given In Table 25.

Table 25: Distribution of beneficiaries of employment generation according to the number of days of employment per annum (in percentage)

Number of days	West Bengal	All-India	Maximum value States	Minimum value States
0 - 30	100	68.75	West Bengal, Karnataka, Rajasthan	Madhya Pradesh 23.75
31 - 50	0	17.14	Madhya Pradesh 61.25	West Bengal, Karnataka, Rajasthan
51 - 100	0	11.43	Andhra Pradesh, Uttar Pradesh 20.00	West Bengal, Karnataka, Rajasthan
Above 100	0	2.48	Uttar Pradesh 16.25	West Bengal, Karnataka, Rajasthan

Source : PEO evaluation study.

From Table 25 it is seen that in West Bengal EAS beneficiaries received maximum employment for 30 days only. But at all-India level there are cases where 2.48 percent beneficiaries responded that they have received employment for more than 100 days. According to the study in Uttar Pradesh 16.25 percent beneficiaries received employment for more than 100 days. In PEO evaluation study information was collected on whether more than one person from the same family received employment under EAS. In West Bengal 50 percent of the beneficiaries household responded that only one member of the beneficiary households received employment under EAS while at all-India level 81.16 percent beneficiary households mentioned that only one member received employment (Table 25a).

Table 25 a: Distribution of sample families according to number of persons employed per family per annum under EAS (in percentage)

No. of sample households employed with	West Bengal	All-India
One person	50.00	81.16
Two persons	48.75	16.96
More than two persons	1.25	1.88

Source : PEO Evaluation Study.

At all-India level in case of 1.88 percent beneficiary households more than two members of the household received employment under EAS while in West

Bengal the corresponding figure is 1.25 percent. According to this study in seven States more than two persons of a beneficiary household never got employment under EAS – the States are Gujarat, Haryana, Himachal Pradesh, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu. From Table 25 and Table 25a it is clear that the extent of employment generation through EAS is not that much intensive in West Bengal.

Asset creation

According to the guidelines of EAS, of the total allocation received 40 percent is to be spent for schemes of water and soil conservation like afforestation, silvipasture and agro horticulture, 20 percent is to be earmarked for minor irrigation, 20 percent for link roads and 20 percent for primary school and anganwadi buildings. The PEO Study reflected wide divergence from these sectoral allocations.

Table 26: Percentage distribution of expenditure

Nature of activity		West Bengal	All-India	Deviation from norm in West Bengal
1.	Watershed development	10.39	25.73	-29.61
2.	Minor irrigation	35.58	20.13	+15.58
3.	Link roads	40.53	29.47	+20.53
4.	School Building and Anganwadis	13.49	19.26	-6.51
5.	Others	0	5.41	-

Source : IISDM Study.

From Table 26 it is seen that major attention in West Bengal went to the construction of the capital-intensive works like construction of link roads. Watershed development has the large potentiality to absorb rural labour on one hand and at the same time it has the scope to improve environment of the area – but this area of asset creation is very much neglected in course of planning of schemes in West Bengal. Further, in the construction of social infrastructure also West Bengal is lagging behind all-India average.

Income from EAS

The PEO Study collected information to assess the contribution of wage income from EAS to total income of beneficiary households. This information shows that in West Bengal beneficiary households responded that of the total income they

derived from wage employment EAS has 77 percent share while the share of schematic wage employment income in total household income is only 5.17 percent. The corresponding all-India figures are 88.28 percent and 11.25 percent respectively which indicates that contribution of EAS is less in West Bengal. However, as regards the sustainability of income from EAS the situation is better in West Bengal because, according to PEO Study,33.75 percent beneficiaries received employment under EAS for two consecutive years, 12.50 percent for three consecutive years and 2.75 percent for four consecutive years. All these are better than all-India figures (at all-India level the corresponding figure is 11.16 percent for 2 consecutive years, 1.16 percent for 3 consecutive years and 2.75 percent for 4 consecutive years). The PEO evaluation study mentioned that in Assam, Karnataka and Gujarat no EAS beneficiaries received employment for more than one year. Table 27 presents the distribution of beneficiaries according to wage income earned.

Table 27: Distribution of beneficiaries according to wage income earned during one year (figures in percentage)

Income (in Rupees)	West Bengal	All-India	Maximum value state	Minimum value state
Up to 500	82.50	40.45	Uttar Pradesh, West Bengal	Gujarat
			82.50	11.25
501 - 1000	13.75	24.64	Orissa	Tamil Nadu
			47.50	10.00
1001 - 2000	3.75	24.55	Madhya Pradesh	Uttar Pradesh
			73.75	0.00
2001 - 4000	0	7.77	Tamil Nadu	Uttar Pradesh, West Bengal
			15.0	0.00
Above 4000	0	2.59	Tamil Nadu	Uttar Pradesh, West Bengal
			23.75	0.00

Source : PEO Study.

From the table it is evident that more than 96 percent of the beneficiaries in West Bengal received wages from EAS to the maximum extent of Rs. 1000 only which means maximum possibility of getting 19 days employment on an average. But in some States beneficiaries received more employment in EAS and thus earned more income in comparison to West Bengal beneficiaries. Examples are the cases of Madhya Pradesh and Tamil Nadu.

Conclusion

From the observations made above it can be concluded that in West Bengal very often it was not possible to achieve financial target fully. As a result, in most of the years huge amount of funds provided by the Govt. of India remained unutilised. This trend deprived the rural poor from the opportunities they are supposed to get. Different impact studies also reflect the poor implementation of the poverty alleviation programmes in West Bengal. Income generation under self-employment programme like IRDP in West Bengal has not been sufficient enough to help the beneficiaries to cross the poverty line. This is a weak area in programme implementation in West Bengal. Though the panchayats are involved in all walks of planning and implementation of poverty alleviation programmes in rural areas, these weaknesses prevail. It is a fact that the involvement of the panchayat bodies creates awareness among the beneficiaries about the programmes but still there exists scope for strengthening the delivery mechanism. Employment generation scenario in West Bengal is also depressing because it was possible to provide only 5 to 20 days employment to poor families under JRY/EAS as against the assurance of 100 days of employment in a year. It is necessary that programme implementation and decision-making power should be bestowed more on the community. For achieving this in West Bengal, Community Convergent Action (CCA) has been initiated. It is expected that it will be possible to bring in radical changes in implementation of rural development programmes. Only future can tell about the efficacy of this new strategy. However, poverty alleviation programmes alone are not the panacea for all ills. To make the poverty reduction sustainable it is also necessary to ensure quality of life for the poor.

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TREND OF PRODUCTION AND EMPLOYMENT IN VILLAGE INDUSTRIES IN INDIA : AN ANALYSIS

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The New Economic Policy of the Indian Government has the 'three-way fast lane' of liberalization, privatization and globalization (LPG) as its main plank. Its main objectives are to achieve higher growth rates of national income and employment through these processes of LPG. More than ten years have passed since then. In this paper an attempt is made to get an idea about how far these objectives have been achieved in respect of village industries in India. For a meaningful analysis the period chosen for the study covers both the pre - and the past - liberalization periods.

I

INTRODUCTION

Context and Research Problem

India now lives in an era of economic liberalization. Since the mid-80s India started the process of liberalizing her economy[1] and since 1991 the process has been consistently pursued [2] with the adoption of the model of 'the three-way fast lane' of liberalization, privatization and globalization. These 'first generation reforms' have emphasized growth by encouraging the conditions for private sector investment through the reduction of taxes, the opening up of foreign trade and investment and integration of every one in the economy into the mainstream. The Ninth Five Year Plan has emphasized the acceleration of economic growth by speeding up the liberalization process and speaks of generation of employment as a corollary of this growth process by making it more market-friendly[3]. It is held that growth of village industries and employment therein will be significantly promoted by the liberalization process.[4]

The liberalization process has, on the other hand, reduced the role of the public sector investment. It has led to the state withdrawal from economic sectors and infrastructures.[5]

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The questions that may arise in this context are: What are the trends of plan allocation and fund availability for village & small industries (VSI) and khadi & village industries (KVIC) following the liberalization process? What have been trends of production and employment in village industries during the period following the liberalization process? What are the proximate demand and supply sources of growth of production and employment in village industries which are getting more market-oriented following economic reforms? The present study seeks to address these questions with reference to village industries of India.

Objectives of the study

The present study thus sets the following objectives for itself:

(i) To analyse the trend of plan allocation and fund availability to village industries in recent plan periods,

(ii) To examine the trend of growth of production and employment in village industries in the pre- and post- liberalization period,

(iii) To analyze the demand and supply sources of growth of production and employment.

Hypotheses

(i) Budgetary support for village and small industries, particularly for khadi and village industries has been decreasing after liberalization.

(ii) Growth of production and employment in village industries decelerated significantly after liberalization of the economy.

(iii) Growth rates of production and employment in village industries before and after economic reforms are significantly different.

(iv) Sales as a demand factor and real earning per employee as a supply factor have also decelerating trends following economic liberalisation.

(v) Sales and earnings per employee significantly influenced growth of production and employment in village industries.

Data base and Methodology

The study is based on secondary data. Annual Reports of the *Khadi and Village Industries Commission, Government of India* constitute the major data base of the study. Besides, we have taken resort to the necessary data from Economic Survey, Government of India.

Simple statistical techniques like ratio, index number and regression have been used to analyse the data. The wholesale price index for manufactured products has been used to obtain the values of production, sales and earnings per employee at constant prices. The compound annual growth (CAGR) rates have been estimated

for the relevant variables from log-linear equations. The log-linear trend equation can be written as follows:

$\ln Y = a + b\,t$, a and b are constants.

The compound growth rate (CAGR) has been calculated by the formula

$$CAGR = e^{b} - 1$$

The quadratic trend has been estimated to examine whether the growth is accelerating or decelerating significantly. The dummy variable has been used for the estimation of the impact of economic liberalization. The period from 1972 to 1991 has been considered for pre-liberalization and the period from 1992 to 1998 for post-liberalization. To test whether the estimates are significantly different two periods or not, F-statistic between these denoted by F* has been used.

$$F^* = \frac{(SSE_R - SSE_1 - SSE_2)/k}{(SSE_1 + SSE_2)/(n+m-2k)}$$

where, SSE_R is Error Sum of Squares under the null hypothesis that the parameters for the two periods are different, $SSE_1 + SSE_2$ is the total sum of squared error under the alternative hypothesis of no restrictions. It should be noted that our pre-liberalization period constitutes larger number of years and hence larger number of observations than the post-liberalization period.

II

PLAN ALLOCATION AND FUND AVAILABILITY FOR VILLAGE INDUSTRIES

In this section our focus is on analysing the trend of plan allocation and its availability for Khadi and Village Industries Commission (KVIC). This is done in relation to two aspects, namely (i) public sector plan outlays and (ii) village and small industries (VSI) plan outlays. Detailed information about the budgetary allocation made for KVI in recent plans and the funds made available by the central government is presented in Table 1. It is revealed that plan outlay for public sector as a whole increased over 5 times from the 6th plan to the 8th plan but that for KVIC increased only 1.71 times during this period. Budgetary support for the development of village industries has not thus increased as much as for the public sector. During this period percentage share of plan allocation for KVIC in total plan outlay for public sector was less than 2% and that decreased from 1.90 during the 6th Plan to 1.81 during the 8th Plan. The second crucial aspect is the fund availability for KVI. The fund availability has been increasing but that very insignificantly during the 6th plan to the 8th plan by only 19 per cent during the 17 year period, i.e., by 1.1 per cent

per annum at current prices. Thus, there was a gap between budgetary allocation and fund availability and this gap was widenning very sharply. The percentage share of fund availability in plan allocations for KVI had been falling from 74.0 percent during the 6th plan to 32.6 percent during the 8th plan. It thus appears that KVI has been a neglected sector, although its role in employment generation is always recognized.

Table 1: Plan Allocation and Fund Availability to Khadi and Village Industries (KVI) of India, Sixth to Eighth Plan

Plan Period (1)	Public Sector Plan Outlay (Rs. Crore) (2)	Plan allocation for KVI (Rs. Crore) (3)	Percentage of KVI Plan allocation in Public sector Plan outlay (4) = { (3)/(2)x100}	Fund Available to KVI (5)	Percentage of KVI fund available in KVI Plan allocation (6) = {(5)/(3)}x100
VI (1980-85)	69380 (100)	1296 (100)	1.90	960.31 (100)	74.0
VII (1985-90)	180000 (259)	1860 (144)	1.03	1060.11 (110)	56.9
VIII (1992-97)	434100 (626)	3518 (271)	1.81	1147.00 (119)	32.6

Source: ***Economic Survey,*** **Government of India**

Table 2 presents KVI data concerning fund availability in relation to those of village and small industries (VSI). We observe that the plan allocation for VSI increased only 1.46 times while public sector plan outlay increased 5.26 times during the 6th plan to the 8th plan at current prices, leading to decreasing percentage share of plan outlay for VSI to total plan outlay from 1.8 to 1.1 during the 6th Plan to the 8th Plan. The percentage share of fund available to KVI in VSI plan outlay declined sharply from 49.4 to 24.01 during this period. Thus, village industries appeared to be the neglected sector in relation to VSI also.

Table 2: Plan Outlays for Village and Small industries during different Five Year Plans

Plan Period (1)	Public Sector Plan Outlay (Rs. Crore) (2)	Plan Outlay for VSI (Rs. Crore) (3)	Percentage of VSI Plan Outlay in Public Sector Plan Outlay (4) = {(3)/(2)}x100	Fund Available to KVI (5)	Percentage of fund available to KVI in VSI Plan Outlay (6) = {(5)/(3)}x100
VI (1980-85)	69380 (100)	1945.1 (100)	1.8	960.31 (100)	49.4
VII (1985-90)	180000 (259)	2752.7 (142)	1.5	1060.11 (110)	38.5
VIII (1992-97)	434100 (626)	4778.0 (246)	1.1	1147.00 (119)	24.0

Source : ***Same as in Table 1.***

All this confirms our first hypothesis that budgetary support for village and small industries, particularly for khadi and village industries has been decreasing after liberalization.

III
Trend of Production and Employment in Village Industries of India

For our analysis of the trend of production and employment we have estimated regression equations for the period from 1972 to 1998. The regression results are shown in Table 3. Both the regression equations for production and employment are statistically significant. The exponential growth rates for both production and employment are showing falling tendencies during the period under study. Both production and employment of the village industries have increased at decreasing rates. See also Figure 1 and Figure 2.

Table 3: Trend Equations of Production and Employment of Village Industries, 1972-98

Dependent Variable	Fitted Equation	$\bar{R}^2$	F	Exponential Trend
Production	$\ln P = 4.18 + 0.103t - 0.001t^2$ (49.9) (6.55) (-1.92)	0.94	191.4	0.10 – 0.002t
Employment	$\ln E = 1.93 + 0.11t - 0.002t^2$ (72.51) (25.24) (-10.02)	0.99	2124	0.11 – 0.004t

Note: ( ) Figures in parentheses indicate t-ratios.

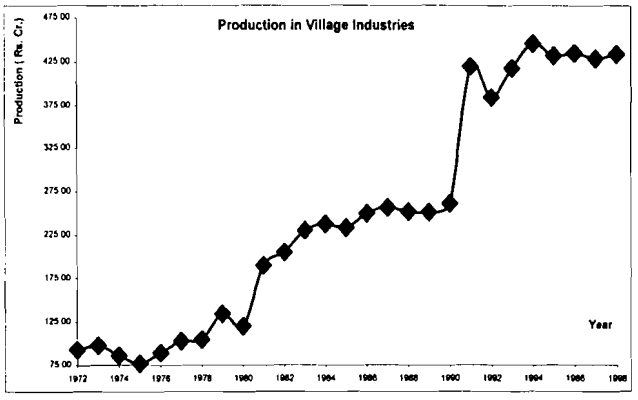

Figure 1

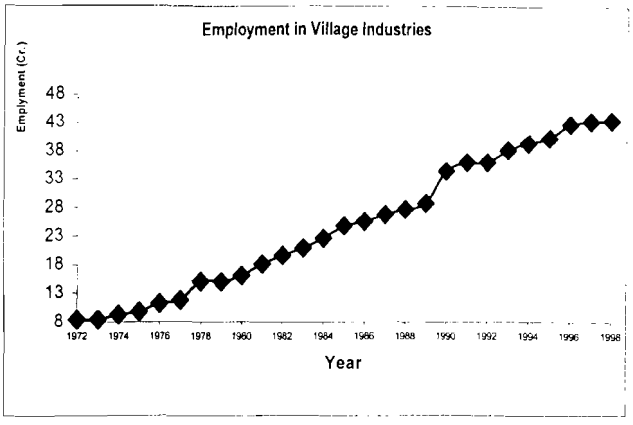

Figure 2

Thus, our second hypothesis (1) that growth of production in village industries has decelerated significantly after liberalisation of the economy is not accepted and (2) that the growth of employment in these industries has decelerated is accepted.

Now, to assess the impact of economic liberalization on the growth rates of production and employment has been constructed with a slope dummy variable.

$\ln Y = a + (b + c\ D)\ t$
where a = intercept, b and c are the regression co-efficients, and
D = 0, for every year of pre-liberalization period
= 1, for every year of post-liberalization period

The regression results of this model are shown in Table 4. The co-efficient c shows the impact of dummy variable. The regression equations for both production and employment are seen to be statistically significant. The effect of dummy variable on production is not, however, statistically significant even at 10% level. In case of employment, it is significant at 1% level.

Table 4 Trend Equation of Production and Employment of Village Industries with dummy variable, 1972-98

Dependent Variable	Fitted Equation	$\bar{R}^2$	F
Production	$\ln P = 4.27 + 0.079\ t - 0.0057D\ t$ (58.25) (12.95) (-1.26)	0.93	176.04
Employment	$\ln E = 4.12 + 0.112t - 0.026D\ t$ (53.61) (17.45) (-5.50)	0.95	228.54

Note: ( ) Figures in parentheses indicate t-ratios.

The results show that the production experienced 7.9 % and 7.3 % growth rates per annum the 1972-91 and 1992-98 periods. However, the difference during in the growth rates was not significant. Hence, it can be inferred that the production increased at annual rate of 7.9 percent during the entire period. The economic reform did not have any significant effect, positive or negative on the production of the village industries. However, in the case of employment the picture is completely different. The employment registered annual growth rate of 11.2 % and 8.6 % during the pre-liberalization and the post-liberalization periods and the decline by 2.6 percentage points in the annual growth rate was found to be statistically significant at 1% probability level. Thus, it appears that in the case of generation of employment the post- 1991 period (upto 1998) did have significant negative impact of employment.

Table 5: CAGR of Employment in Village Industries of India, 1972-98, 1972-91 and 1992-98

Year	Fitted Equation	$\bar{R}^2$	F	CAGR (%)	F*
1972-98	lnE = 2.14 + 0.067 t (56.62) (28.88)	0.97	833.8	6.93	25.89
1972-91	lnE = 2.04 + 0.079 t (71.70) (33.19)	0.98	1101	8.22	
1992-98	lnE = 3.56 + 0.033 t (208.1) (8.57)	0.92	73.5	3.35	

Notes: ( ) Figures in parentheses indicate t-ratios.

The trend equations in Table 5 for two different periods show that they are statistically significant. The CAGRs are found to be positive throughout the whole period (both before and after liberalization). But it has declined in the post-liberalization period. The CAGR is estimated to be 8.22 per cent during 1972-91 and it is statistically significant at five per cent level. Similarly, during 1992-98 (the post-liberalization period) the CAGR was 3.35 percent, which was lower than 8.22 per cent during 1972-91 (the pre-liberalization period). F* statistic indicates that this decline in growth rate of employment is statistically significant at 1% level.

Table 6: CAGR of Production in Village Industries of India, 1972-98, 1972-91, 1992-98

Year	Fitted Equation	$\bar{R}^2$	F	CAGR (%)	F*
1972-98	lnP = 4.32 + 0.07 t (68.9) (18.5)	0.92	342.4	7.57	3.25
1972-91	lnP = 4.26 + 0.08 t (14.6) (2.66)	0.89	156.8	8.32	
1992-98	lnP = 5.99 + 0.02 t (169.3) (1.76)	0.26	3.1	2.02	

Note: ( ) Figures in parentheses indicate t-ratios.

The GAGRs of production has been estimated for two periods. CAGR has fallen from 8.32% in the pre-liberalisation period to 2.02% in the post- liberalization period and that fall in growth rate is statistically significant at 5% level.

All this confirms our hypothesis that growth rates of production and employment in village industries before and after economic reforms are significantly different.

IV

Trend of Sources of Growth of Production and Employment in Village Industries

Sources of growth of production and employment in village industries may be divided into two groups – supply sources and demand sources. Supply sources are those which influence production and employment from the supply side. Among the supply sources we consider earnings per employee at constant prices. On the other hand, demand source considered here are sales of products of village industries.

The justifications for inclusion of these supply and demand variables determining employment and production are as follows. Earnings per employee at constant prices are nothing but the real wage rate of workers in village industries. Demand for labour in village industries is negatively associated with real wage rate, i.e., as real wage rate increases, level of employment decreases. Again, employment and production are positively associated. Hence, both employment and production

can be seen as a function of real wage rate or earnings per employee at constant prices. On the other hand, sales of village industry products reflect demand for those products both indigenous and overseas and these products are hardly consumed at the producer's level. Hence, volume of sales of village industry products directly determines both employment and production.

We may now examine growth of these individual sources of growth of village industries.

Table 7 shows the best-fitted trend equations during 1972 to 1998.Both the regression equations for sales and earning per employee are statistically significant. Both sales as a demand factor and earning per employee as a supply factor have increased at decreasing rates.

Table 7: Regression Equations of Sales and Earnings per Employee in Village Industries, 1972-1998

Dependent Variable	Fitted Equation	$\bar{R}^2$	F	Exponential Trend
Sale	$\ln S = 3.87 + 0.18t - 0.004t^2$ (40.73) (11.6) (-6.36)	0.94	273.7	0.18 – 0.008t
Earnings per Employee	$\ln(ER/E) = 0.224 + 0.11t - 0.003t^2$ (2.49) (7.64) -5.69)	0.81	54.8	0.11 – 0.006t

Notes: ( ) Figures in parentheses indicate t-ratios

Thus, our fourth hypothesis that sales as a demand factor and real earning per employee as a supply factor have also decelerating trends following economic liberalization is accepted.

Earnings per Employee

Growth of earnings per employee turned to be significantly negative in the post-liberalization period (Table 8). F*-statistic also indicates that the differences in two growth rates in the pre- and post-liberalization periods are statistically significant.

Table 8: CAGRs of Supply Sources of Employment in Village Industries, 1985-91 and 1992-98

Year	Fitted Equation	$\bar{R}^2$	F	CAGR (%)	F*
1972-98	ln(ER/E) = 0.62 + 0.03 t (7.21) (5.85)	0.88	34.23	3.04	
1972-91	ln(ER/E) = 0.404 + 0.057 t (6.28) (10.62)	0.86	112.8	5.87	5.97
1992-98	ln(ER/E) = 1.35 - 0.0354 t (21.9) (-3.5)	0.65	12.25	-3.44	

Notes: ( ) Figures in parentheses indicate t-ratios

Sales

Like earnings per employee, growth of sales was statistically significant before liberalization and the growth rate was 11.96 per cent per annum. But that in the post-liberalization phase is not statistically significant. The chow F, denoted by F*, signifying he difference in the growth rate of sales between the periods 1972 – 91 and 1992 –98, is statistically significantly different from zero. This means that the effect of the demand factor represented by sales on production and employment was insignificant, while that of supply factor was significantly negative (see Table 9).

Table 9: CAGR of Sales, 1972-91and 1992-98

Year	Fitted Equation	$\bar{R}^2$	F	CAGR (%)	F*
1972-98	lnS = 4.33 + 0.08 t (44.73) (14.02)	0.88	196.6	8.3	
1972-91	lnS = 4.10 +0.113 t (225) (8.12)	0.98	66	11.96	24.06
1992-98	lnS = 6.16 + 0.0068 t (84.3) (0.42)	-0.16	0.72	0.68	

Notes: ( ) Figures in parentheses indicate t-ratios.

V

Growth of production and Employment in Relation to Their Sources of Growth

Our regression analysis on employment in relation to the supply source and the demand source shows that growth of employment in village industries has been significantly influenced by both sales and earnings per employee (Table 10). The coefficients of both sales and earnings per employee are statistically significant at one per cent level in both employment and production equations. These independent variables explain the variation in employment and production to the extent of 94 to 97 per cent. The models are statistically significant at one per cent level.

Table 10: Regression Equations concerning Employment in Village Industries, 1972-91 and 1992-98

Year	Fitted Equation	R^2	F	DW
1972-98	E = 12.05 + 0.092 S - 5.06 (ER/E) (7.88) (21.49) (-6.40)	0.97	388.0	1.33
1972-98	P = 116.84 + 1.02S - 60.44 (ER/E) (4.66) (14.55) (-4.66)	0.94	188.0	1.61

Notes: ( ) Figures in parentheses indicate t-ratios

Both employment and production in village industries are positively related with sales and negatively related with earning per employee during the whole period, i.e., 1972 to 1998.

All this confirms our hypothesis that the sales and the earnings per employee significantly influenced growth of production and employment in village industries.

The data pertaining to production, employment, sales and earnings are presented in Appendix 1.

VI

CONCLUSIONS

Economic liberalization that initially started in the 1980s and has been consistently and vigorously pursued since 1991 has encouraged conditions for private sector investment and also led to the withdrawal of the state from economic sectors

and infrastructures. Plan allocation for VSI including KVI in relation to total plan outlay of the country has been very low and gradually decreasing especially after the mid-1980s. Village industries had been a neglected sector. Our study on production and employment in village industries reveals that during the liberalization period both production and employment in these industries increased but their growth decelerated. Sales as a demand factor and real earning per employee as a supply factor also reflect a diminishing tendency in the post-liberalization phase. The real earning per employee as a supply side factor and sales as demand factor have significantly influenced growth of employment and production in this sector.

Notes

1. Bhat, 2000: 197, and Sau, 2000: 1.
2. Bhat, 2000: , Datt, 2000:172
3. Government of India, Ninth Five Year Plan
4. Bhattacharya.1989 and Das, 1999.
5. Kumar, 2000: 807-8
6. Puspalata, 2000, 180-1

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Appendix 1

Production, Sales, Earnings, and Employment of Village Industries, 1972 to 1998

Year	Production Rs. ('000)	Sales Rs. ('000)	Earning Rs. ('000)	Employment No. (Lh)
1972	94	81	16	8.4
1973	109	97	18	8.4
1974	122	116	22	9.3
1975	136	133	28	9.8
1976	148	152	35	11.2
1977	172	175	40	11.7
1978	193	190	50	15.0
1979	243	242	59	15.0
1980	248	359	79	16.1
1981	451	476	101	18.1
1982	541	634	151	19.6
1983	632	791	201	20.9
1984	722	949	251	22.6
1985	759	1106	301	24.8
1986	827	1264	351	25.6
1987	896	1421	401	26.8
1988	964	1579	451	27.7
1989	1033	1736	501	28.8
1990	1101	1895	547	34.4
1991	1994	2229	647	36.0
1992	2150	2515	747	36.0
1993	2523	2801	846	38.1
1994	2877	3344	916	39.4
1995	3234	3886	986	40.3
1996	3504	4429	1056	42.8
1997	3760	3926	1126	43.4
1998	3895	4319	1276	43.5

Source: KVIC, Annual report

STRUCTURAL ADJUSTMENT IN THE INSURANCE INDUSTRY IN INDIA

(A study with special reference to life insurance sector)

Dr. Arindam Gupta*

In the wake of the NEP (1991) of the Indian Government the Malhotra Committee was constituted by the Central Govenrment in April, 1993 to suggest reforms in the insurance sector. The essence of the recommendations of the Committee is to open the insurance sector to private insurance xompanies, both domestic and foreign, so that "efficiency, effectiveness, economy of operations, accountability, profotability, competitive viability and balanced growth" can be achieved in the Indian insurance sector. The Insurance Regolatory and Development Authority (IRDA), established with the objective of implementing these recommendations, granted the first set of licences on October 23, 2000 and with this the competition in the insurance sector set in. In this paper an attempt has been made to see how far these objectives have been fulfilled with reference to the Life Insurance Corporation of India (LICI), the only public sector company in the insurance sector, and the ICICI Prudential Insurance Company in the private sector.

The new face of the Indian life insurance industry is craving for attention. The dozen-odd private and joint-venture companies are fighting a quiet but intense battle to make their presence felt among the Indian consumers. Competition has been well set in the Indian life insurance sector barely a year after the Insurance Regulatory and Development Authority (IRDA) opened the doors for the re-entry of private insurance companies by granting the first set of licences on October 23, 2000. All the previous incidents are the results of the recommendations of R. N. Malhotra committee, which was constituted by the central government in April, 1993 to suggest reforms in the insurance sector. Different political parties, trade unions and even the academic circle had some reservations against those recommendations. They levelled the charge that the reform measures were the result of neo-imperialistic hegemony imposed on the Indian economy under pressures from the I. M. F. and World Bank, gearing the national insurance sector back to the pre-nationalisation era.

Why was there so much resistance against the recommendations of the Malhotra committee? How far will those recommendations be able to fulfil the stated objectives

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of establishing "efficiency, effectiveness, economy of operations, accountability, profitability, competitive viability and balanced growth" in the Indian insurance sector? These are some of the questions which deserve special attention.

For an indepth study on the recommendations, we have considered Life Insurance Corporation of India, the only public sector company in the life insurance sector and ICICI Prudential Insurance Company, a private sector life insurance company which has newly started doing insurance business following the recommendations. The study is organised on the following lines: Section II is devoted to a brief description of the background behind the formation of the committee. In section III, committee's recommendations on structural adjustment have been presented. Section IV deals with the critical evaluation of the recommendations in the light of LICI's performance. The current status of Indian life insurance market and new entrants in the life insurance sector have been discussed in section V. Section VI deals with a comparative analysis between LICI and ICICI-PRUDENTIAL (a joint–venture private life insurance company) regarding life insurance products. Section VII concludes the write-up.

Background in Brief

The story behind the formation of Malhotra Committee for suggesting necessary reforms in the insurance sector is very startling. This is evident from the wide gap that exists between the findings of the committee and its recommendations. In other words, one will not be able to find out rationale behind the proposed recommendations even from the Committee's own findings on the present performance of the insurance industry.

Before nationalization of life insurance sector the rural areas were totally neglected and so also the industrial workers from the purview of the insurance business. Social insurance was unknown. The policyholders' money was cheated.

From 1945 to 1955, 25 companies went into liquidation while another 25 ran into so much losses that their business had to be transferred to other companies at a loss to their policyholders. The main objective behind the nationalization of the insurance were: spreading the message of insurance in every nook and corner of the country, meeting various insurance needs of the society and acting as trustees of the insured public, rendering service efficiently and effectively with courtesy, etc.

After nationalization the LICI is not only growing by leaps and bounds (which is evident from Table 1) but also going to be identified for its social service in addition to insurance business. Besides, in 2000-01 LICI paid the Government of India an amount of Rs. 250 crores as dividend. The society also stands benefited funds of the LICI, which is being clearly shown in the above table. Moreover, one cannot also raise question about the efficiency of LICI, regarding claim settlements. The claim settlements in case of LICI over the years are presented in Table 2.

Table 1
Progress at a Glance

Total new business	Year							
	1957	1969-70	1974-75	1979-80	1997-98	1998-99	1999-00	2000-01
Individual (Rs in crores)	336.37	990.03	1772.61	2744.33	63927.83	75606.26	91214.26	124757.14
Group (Rs in crores)	@	46.05	1339.82	5262.06	75148.22	69558.14	66619.43	UC
Business in force								
Individual (Rs in crores)	1476.52	6348.09	11852.25	19242.55	4,00,747.88	459201.04	536450.82	UC
Group (Rs in crores)	5.29	77.17	1457.00	6137.46	74798.75	77918.65	76384.53	UC
Number of policies in force (in Lakhs)	56.86	140.40	188.20	220.94	850.03	917.26	101.89	UC
Total number of lives covered under								
Group business	@	@	23.34	58.41	251.93	242.39	243.02	UC
Life fund (Rs. In crores)	410.40	1611.03	3033.79	5818.09	105832.89	127389.06	15404.73	UC
Investment (Rs. in crores)								
(a) Book value of total investments	381.90	1514.26	2798.43	5747.51	98948.00	120445.00	146364.00	175491.00
(b)Book value of socially oriented investments	@	513.21	1218.52	2472.29	73082.00	88831.00	117888.00	139926.01

@ Figures not available, U.C-Under compilation at the time of going to press.
(Source : L.I.C.I. Diary, 2002)
ddc3

Table 2
Claims Settlement Operations

Year	Claims intimated		Claims settled during the year		Claims outstanding at the end of the year	
	Number (in Lakh)	Amount (Rs in Crore)	Number (in Lakh)	Amount (Rs in Crore)	Number (in Lakh)	Amount (in Lakh)
1996-1997	49.42	5722.38	49.49	5691.49	1.60	319.59
1997-1998	56.51	6673.03	56.52	6677.04	1.59	315.62
1998-1999	60.07	7615.78	59.83	7583.18	1.83	348.22
1999-2000	66.19	9266.25	66.42	9211.30	1.60	403.17
2000-2001	75.55	11666.82	75.86	11637.98	1.29	432.01

(Source: L .I .C.I. Diary, 2002)

Realising this performance perhaps, different commissions supported the monopolistic or monolithic size and nature of the corporation.

Therefore, the clue behind the formation of the committee has to be found out from a different angle. Mr. Peter Grant, Chairman of the U.K.–based Sunlife Assurance Society, who came to India in January, 1993 as a business delegate announced that this company was likely to penetrate the Indian insurance market as a Joint venture with LICI and he did not hesitate to add that. "...in 10 to 15 years' time we may want to operate on our own" (*Economic Times, January, 1993*). The press reports, not denied by the Government sources, intimated that three U.K. companies- Prudential Insurance, Eagle Star and Graysham Insurance wanted to step into the life insurance business in India. The U.S. administration continues to threaten that it would revive the imposition of economic restrictions if U.S. insurers' access to the domestic market is denied.

So one cannot exclude the existence of external pressures and threats on this issue. This is also clear from the expression of Mr. K.P. Narasimhan, Ex-Chairman of LICI: "..... the insurance industry will like to face a lot of competition in future, particularly from the private sector and from outside the country in the wake of the liberalization policies and pressures from the I.M.F. to open India's insurance industry to the world "
(*Financial Express, dt. 17/09/1992*).

Committee's Recommendations

The Committee on Reforms in Insurance sector under the Chairmanship of former Governor of Reserve Bank of India, Shri R.N. Malhotra, which submitted its report on 7.2.1994, gave some recommendations for structural reforms in the life insurance sector (here, recommendations on general insurance sector are not being taken into consideration). Some important recommendations are as follows:

.....Private sector be granted to enter insurance industry with a minimum paid-up capital of Rs.100 crores.

.....Foreign insurance companies be permitted to enter by floating an Indian company, preferably a joint venture with Indian partners.

.... State-level co-operatives be enabled to set up co-operative societies not more than one in a State of transacting life insurance business subject to regulation by the insurance regulatory authority. Their capital base should be appropriately lower.

.....Post life insurance be granted to transact life insurance business in rural areas among the general public.

.....Life Insurance Corporation of India (L.I.C.I) be converted into a company and its capital should be raised to Rs.200 crores, 50 percent to be owned by Government and the rest by public at large with suitable reservation for its employees.

.....Steps be initiated to set up a strong and effective insurance regulatory authority in the form of a statutory autonomous board in the lines of S.E.B.I.

.....The office of the controller of Insurance be restored its full functions under the Insurance Act and set up as a separate office.

.....There will be a full re-structuring of L.I.C.I Its central office should be a compact and highly professionalised establishment concentrating on formulation, investment, product development, actuarial valuation, personnel policy and accounts of the corporation.

.....Zonal offices of L.I.C.I. be converted into its Head Office for insurance business and related matters in their jurisdictions and Zonal Managers be made members of L.I.C.I board.

.....Landless Agricultural Labourer Group Insurance (LALGI) and Integrated Rural Development Programme (I.R.D.P) beneficiaries schemes etc. which are relief-oriented welfare schemes be transferred to the concerned government authorities.

.....All insurance companies be treated on equal footing and governed by the provisions of the Insurance Act. No special dispensation be given to L.I.C.I.

Critical Assessment of the Recommendations

We are now in a position to estimate the relevance and necessity of these recommendations in the national scenario. Committee's recommendations on (i) re-organisation of L.I.C.I's offices and (ii) setting up insurance regulatory authority, may be considered to be in the right direction and may be prescribed for better health of the insurance sector. For example, internal autonomy, abolition of distance management system, decentralization of power and individual accountability would be restored from the proposed re-organisation of L.I.C.I's offices. Likewise, fraudulent and unhealthy practices, if any, can be checked by the establishment of strong and effective insurance regulatory authority.

But, without undertaking a systematic and comprehensive analysis of issues relating to costs, efficiency and optimum scale in Indian life insurance sector, the Committee's hectic proposals on (i) the entry of co-operative societies and postal life insurance in the life insurance business, specially in rural areas, and (ii) taking charge of social welfare-oriented insurance schemes under Government responsibility, will intensify the dualistic feature in the Indian insurance market, leaving the role of the Government only as "loss absorber".

Privatization of life insurance business in India is, however, the main theme of all recommendations of the Malhotra Committee, even when the life insurance business in India under the umbrella of LICI has made tremendous progress. L.I.C.I's progress has already been depicted in Table 1 and L.I.C.I's investments to State and

Central government securities and socially oriented sector have been presented in Table 3, which may justify L.I.C.I's sole existence so far which has enabled it to perform the twin activities of profit-making and serving the society efficiently. So L.I.C.I's privatization is not so necessary for L.I.C.I's growth as it is necessary for the government to improve its fund position from disinvestments and secondly, if the insurance sector is privatized, foreign firm will come here to do insurance business either singly or in joint venture with some indigenous private business house. Ultimately, in the name of competition, the giant foreign insurance companies will swallow the smaller companies and emerge as the leader in the oligopolistic market. They will try to perform the single activity of profit making efficiently, thus neglecting the social service part. As a consequence, the nation's greater interest will be affected. Insurance sector will also become competitive and not so profitable to the L.I.C.I as before.

Table 3
LIC's Investments Some Highlights (Rs. in Crores)

Types of investment	Investment up to							
	31.3.67	31.3.77	31.3.87	31.3.97	31.3.98	31.3.99	31.3.00	31.3.01
1. Central Govt.Securities	235	981	4675	37330	45876	56185	70533	85181
2. Central Govt. and Other Govt. Guaranteed	263	715	1683	8906	10471	12928	14156	17877
3. Electricity (SEBs)	61	733	2603	8214	9153	10591	11931	12402
4. Housing	121	618	1872	10967	12242	14207	15885	17998
5. Water Supply & Sewerage (Mun+Z.P.)	16	203	718	2028	2264	2508	2997	3657
6. State Road Transport Corporation	.	.	180	540	551	671	736	784
7. Loans to Industrial Estates	1	9	37	45	45	45	45	45
8. Loans to sugar Co-Operatives	2	22	37	37	37	37	37	37
9. Development Authority	.	.	1	1	1	1	1	1
10. Roadways, Ports, Railways	.	.	.	.	25	25	85	325
11. Power Generation (Private Sector)	.	.	.	.	276	801	1478	1615
12. Municipality	.	.	.	.	4	4	4	4
Total	**799**	**3281**	**11806**	**68068**	**80945**	**98003**	**117888**	**139926**

(Source : L . I . C . I . Diary , 2002)

The Indian Insurance Market and New Entrants in the Life Insurance Sector

THE INDIAN INSURANCE MARKET

Annual Life insurance premium	Rs. 25,000 Cr. .
Annual non- Life insurance premium	Rs. 9,000 Kr .
No. Life Insurance policy holders	$ 8
Highest per capita spend on Life insurance : Japan	$ 3,000

(Source : Industry Estimates , Business World , 13th Nov , 2000)

NEW ENTRANTS IN LIFE INSURANCE MARKET

Licensed and products launched

Allianz Bajaj Life Insurance Company
Birla Sunlife Insurance Company
HDFC Standard Life Insurance Company
ICICI Prudential Life Insurance Company
ING Vysya Life Insurance Company
Max New York Life Insurance Company
Om Kotak Mahindra Life Insurance Company
SBI Life Insurance Company
Tata AIG Life Insurance Company

Licence obtained , but products yet to be launched

Met Life Insurance Company
Dabur CGU Life Insurance Company
Applied for Licence
Sahara
Relience
Zurich Hero Honda
AMP Sanmar
Cholamandalam- Tude Investment .

(Source : Industry Estimates , Business World , 13th Nov , 2000)

Table 4

LICI vs ICICI – Prudential Life Insurance Company
- a comparative analysis of two selected schemes

ENDOWMENT POLICY (TABLE –14) OF LICI Vs SAVE & PROTECT OF ICICI-PRUDENTIAL

S.A. Rs 2,00,000 ; TERM :20 YEARS ; AGE : 30 YEARS

COMPARATIVE MATURITY BENEFIT OF LICI & ICICI-PRUDENTIAL
(SAVE & PROTECT)

Yearly Premium	LICI	ICICI – PRUDENTIAL
	Rs. 9,591	Rs. 8,868
*Maturity value comprises reversionary bonus @ Rs. 71/- per Rs. 1000 and terminal bonus of Rs. 42,000/- (assumed, remaining the same for the next 20 years)	Rs. 5,26,000*	Rs. 4,68,671 (as per the assumptions of the company @ 3.5% compounded guaranteed addition for 7 years and 4.5% compound reversionary bonus there after and terminal bonus of Rs. 17,717 as indicated)
Maturity value for Re.1/- premium payable for 20 years (maturity Value divided by yly. premium)	Rs. 54.8431	Rs. 52.8497
Yield (ROI) compounded p.a.	8.86%	8.56%

ICICI-PRUDENTIAL yield is less by 0.3% when compared L.I.C.I. The outlay of Rs.8,868 at ICICI-PRUDENTIAL for 20 years fetching a lesser yield of 0.3% is equal to Rs.5,694 on the date of maturity i.e. age 50 of the Life Assured.

With the above amount, the life assured could buy a temporary assurance policy in LICI for a term of 5 years. If we choose the above method of neutralizing the extended term cover for Rs.1,00,000 offered by ICICI-PRUDENTIAL for 5 years after maturity, the average extra death benefit of LICI Policy as worked out in Table 5 of Rs.44,412 remains full and intact.

Table 5

L.I.C.I's ENDOWMENT POLICE (T.14) Vs ICICI-PRUDENTIAL's SAVE AND PROTECT

COMPARATIVE DEATH BENEFIT OF LICI & ICICI-PRUDENTIAL

	DEATH		
DURING	**LICI**	**ICICI-PRUDENTIAL**	**ADVANTAGE LICI**
1st Year	Rs. 214200	Rs. 207000	Rs. 7200
2nd Year	Rs. 228400	Rs. 214245	Rs. 14155
3 rd Year	Rs. 242600	Rs. 221744	Rs. 20856
4 th Year	Rs. 256800	Rs. 229505	Rs. 27295
5th Year	Rs. 271000	Rs. 237537	Rs. 33463
6th Year	Rs. 285200	Rs. 245851	Rs. 39349
7th Year	Rs. 299400	Rs. 254456	Rs. 44944
8th Year	Rs. 313600	Rs. 265906	Rs. 47694
9th Year	Rs. 327800	Rs. 277872	Rs. 49928
10th Year	Rs. 342000	Rs. 290376	Rs. 51624
11th Year	Rs. 356200	Rs. 303443	Rs. 52757
12th Year	Rs. 370400	Rs. 317098	Rs. 53302
13th Year	Rs. 384600	Rs. 331367	Rs. 53233
14th Year	Rs. 398800	Rs. 346279	Rs. 52521
15th Year	Rs. 429000	Rs. 361860	Rs. 67140
16th Year	Rs. 447200	Rs. 395860	Rs. 51320
17th Year	Rs. 465400	Rs. 412876	Rs. 52522
18th Year	Rs. 485600	Rs. 430626	Rs. 54972
19th Year	Rs. 505800	Rs. 449207	Rs. 56593
20th Year	Rs. 526000	Rs. 468624	Rs. 57376
21st Year		Rs. 100000	Rs. 100000
22nd Year		Rs. 100000	Rs. 100000
23rd Year		Rs. 100000	Rs. 100000
24th v		Rs. 100000	Rs. 100000
25th Year		Rs. 100000	Rs. 100000

Total advantage for 20 years in LICI = Rs. 8,88,245
Average advantage per year = Rs. 44,412
Total disadvantage for 5 years in LICI = Rs. 5,00,000
Average disadvantage per year = Rs. 25,000

Average extra death benefit available in the LICI policy during the 20 year term is Rs. (44412 – 25000) Which is equal to Rs. 19412 .

(Source : LICI Bulletin- Kolkata Metropolitan Division Office – I)

CONCLUSION

In fine, it is observed that the government took around seven years time from submission of the Committee's proposals it appointed and implementation of the recommendations so far as one principal recommendation on private participation in insurance industry is concerned. During this time, the governments changed at the center several times and each time a new batch of financial managers of the country came at the top. Various research studies have been undertaken during this period with some common conclusions like consistency in success of LICI, need for improvement in service (specially counter services) in this concern, an uncertain future in the insurance industry after the participation of the private players, need of restructuring the LICI in partial conformity with the Committee's recommendations, LICI's unparallel service in the nation's all-round development and a chance of reduction in LICI's profitability in the event of private player's entry into the Indian insurance market. Besides this, there was a significant economic and political opinion cropping up against allowing the private players to participate. But the last successive governments since 1991-92did not pay much attention to this; rather, they seemed to be in a partially confused and hasty state (as supported by the fact of tabling and withdrawing the IRDA Bill in the Parliament in the past). The present study reveals a simple and straightway fact that if LICI is internally restructured assuring better customer service, there is no need at all to privatize the insurance industry on the ground that it would bring competition in this sector and on the myth that competition would always provide better customer service and thus would also increase the efficiency of LICI. Moreover, the argument advanced by the advocates of privatization in the insurance sector that private companies would demand lower premia for the same risk coverage and give more total benefit at the time of maturity is yet to be proved correct. Naturally, the government's steps to follow the Committee's recommendations in toto have not been found to be wise and rational.

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INSTABILITY OF YIELD RATE, HARVEST PRICE AND GROSS VALUE OF OUTPUT PER HECTARE OF SEASONAL RICE IN WEST BENGAL – A CROSS-DISTRICT ANALYSIS

Jayanta Dutta*, Arunendu Mukhopadhyay**

An attempt has been in this paper to estimate the inter-year variability of rice grown in different seasons in West Bengal and its constituent districts with respect to yield rate, harvest price and gross value of output per hectare for an inter-district comparison for the period from 1977-78 to 1998-99. Among the three seasonal rice grown in West Bengal, aus records the highest degree of inter-year instability with respect to yield rate, harvest price and gross value of output per hectare. The lowest degree of inter-year instability with respect to yield rate and gross value of output per hectare is observed in the case of boro rice.

The relative frequency distribution of number of years under different directional movements of yield rate and harvest price broadly indicates that the farmers of West Bengal are not adversely affected to any considerable extent by the instability of the aforesaid two variables. Instability of yield rate is observed to play a pivotal rate in defining the extent of instability of gross value of output per hectare in the case of aus rice as well as aman rice. In the case of boro rice, however, the overriding influence of harvest price in shaping the extent of instability of gross value of output per hectare is observed.

INTRODUCTION

Stability of production of crops and stability of income deserve to be two important considerations from the point of view of rational crop planning. Stability of production of individual crops is the most important consideration for crop planning for the Government of a nation or a state committed to feed the millions through achievement of targeted production. To the atomistic decision making units engaged in agricultural production, however, stability of income is the most important consideration for crop planning. The actual cropping pattern observed in a nation or a state is a reconciled outcome of these two apparently disparate objective functions. The stability of production is, however, inconceivable in an environment characterized by instability of income.

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Instability of production of an individual crop can directly be ascribed either to instability of acreage under the crop or to instability of yield rate or to a combination of both. An individual farmer has relatively greater control over acreage than over yield rate or price of an individual crop. An analysis of inter-year variability of yield and price received by farmers across different regions of a state of a country thus assumes unquestionable importance from the point of view of stability of production as well as income of the farmer.

West Bengal, one of the important agricultural states of India, contributes nearly 16 percent of annual rice production of the country. Rice occupies around 64 percent of the gross cropped area and 108 percent of the net cropped area of the state. Aus and aman rice account for 4.58 and 46.25 percent of gross cropped area of the state respectively, while the share of boro rice in gross cropped area of the state is around 13 percent.

OBJECTIVES

The broad objective of the study is to examine and analyze the extent of inter-district and inter-year instability of yield, harvest price and gross value of output per hectare. The specific objectives are as follows:

(i) To bring out the extent of inter-year variability of rice grown in different seasons in West Bengal and its constituent districts with respect to yield rate, harvest price and gross value of output per hectare for a meaningful inter-district comparison.

(ii) To identify the districts which show high and low degrees of instability with respect to yield rate, gross value of output per hectare and harvest price of different seasonal rice. This will facilitate sub-zoning of West Bengal on the basis of different instability criteria.

(iii) To identify the districts which show comparatively high percentage of opposite-directional movement and uni-directional positive movement of yield rate and harvest price, and

(iv) To examine the influence of instability of yield and harvest price in framing the instability of gross value of output per hectare.

METHODOLOGY

For the purpose of the study, three types of rice grown in different seasons in West Bengal have been selected. The data on yield rate and harvest price for West Bengal and its constituent districts have been collected from the several issues of 'Statistical Abstract of West Bengal' published by the Bureau of Applied Economics and Statistics, Kolkata, Government of West Bengal, for the time period 1977-78 to 1997-98.

Gross value of output per hectare has been worked out for each type of rice in each year for the constituent districts as well as for West Bengal as a whole as a product of respective yield rate and harvest price.

The districts having relatively inadequate data on any particular item have been kept out of the orbit of comparative analysis with respect to that particular item.

Co-efficients of Variation for the state of West Bengal and its constituent districts with respect to yield rate, harvest price and gross value of output per hectare for three types of rice have been calculated to represent the respective extent of instability.

The Co-efficient of Rank Correlation between yield rate and gross value of output per hectare and between harvest price and gross value of output per hectare of different seasonal rice have also been worked out.

INTER-YEAR VARIABILITY OF YIELD OF RICE PER HECTARE

Table 1 presents the extent of inter-year variability of yield of three types of seasonal rice grown in the districts of West Bengal.

Table 1: Extent of Inter-Year Variability of Yield Rate of Aus, Aman and Boro Rice in West Bengal and Constituent Districts; (1977-78 to 1997-98)

State/District	Aus rice		Aman rice		Boro rice	
	C.V.	Rank	C.V.	Rank	C.V.	Rank
West Bengal	34.20		27.01		21.65	
Burdwan	27.46	2	28.03	6	23.38	8
Birbhum	30.18	3	20.61	1	22.21	6
Bankura	35.3	9	32.22	13	27.00	13
Midnapur	35.91	10	32.71	14	21.43	3
Howrah	31.67	7	30.88	10	22.03	5
Hoogly	24.81	1	29.93	9	21.94	4
24-Parganas	30.41	4	29.65	7	21.36	1
Nadia	32.85	8	34.17	15	21.39	2
Murshidabad	31.16	5	31.62	11	23.09	7
Dinajpur	39.95	14	29.72	8	27.03	14
Malda	36.48	11	31.87	12	24.05	10
Jalpaiguri	31.60	6	24.03	4	26.80	12
Darjeeling	37.28	12	23.42	3	-	-
Cooch Behar	40.71	15	22.23	2	23.91	9
Purulia	39.26	13	27.96	5	25.01	11

Inter-district comparison taking into simultaneous consideration of year-to-year variability in the yield of three types of seasonal rice identifies Hooghly, Birbhum

and 24-Parganas as the most stable districts and Cooch Behar, Nadia and Dinajpur as the most unstable ones. It is also observed from Table 1 that aus rice records the highest degree of inter-year instability with respect to yield rate whereas boro rice records the lowest degree of inter-year instability.

In case of aus rice, the more stable districts are Burdwan and Hooghly with respect to yield rate whereas highly unstable districts are Darjeeling, Purulia, Dinajpur and Cooch Behar. In respect of aman rice, Birbhum, Cooch Behar, Darjeeling and Jalpaiguri are relatively more stable districts and the relatively more unstable districts are Howrah, Murshidabad, Malda, Bankura, Midnapur and Nadia. 24-Parganas and Midnapur districts are relatively more stable districts with respect to yield rate of boro rice whereas relatively more unstable districts in that respect are Purulia, Jalpaiguri, Bankura and Dinajpur.

INTER-YEAR VARIABILITY OF GROSS VALUE OF OUTPUT PER HECTARE OF RICE

Extent of inter-year variability of gross value of output per hectare of three seasonal rice grown in West Bengal is presented in **Table 2.**

Table 2: Extent of Inter-year Variability of Gross Value of Output Per Hectare of Aus, Aman and Boro rice in West Bengal and Constituent Districts (1977-78 to 1997-98)

State/District	Aus rice		Aman rice		Boro rice	
	C.V.	Rank	C.V.	Rank	C.V.	Rank
West Bengal	72.36		64.76		55.80	
Burdwan	70.06	5	67.90	3	62.95	9
Birbhum	68.96	4	67.15	2	58.29	6
Bankura	74.99	9	75.74	9	62.50	8
Midnapur	78.13	11	74.76	8	52.30	3
Howrah	-	-	-	-	-	-
Hoogly	62.79	1	77.95	10	61.68	7
24-Parganas	68.44	2	68.82	4	53.07	4
Nadia	74.04	8	72.37	6	56.60	5
Murshidabad	71.84	7	83.42	11	66.54	11
Dinajpur	80.06	12	74.72	7	63.28	10
Malda	68.71	3	71.94	5	50.05	2
Jalpaiguri	71.41	6	-	-	-	-
Darjeeling	-	-	-	-	-	-
Cooch Behar	75.66	10	58.12	1	44.02	1
Purulia	-	-	-	-	-	-

It is observed from Table 2 that the most stable district with respect to gross value output per hectare of aus rice is Hooghly which is also the most stable district with respect to yield rate of aus rice. Strikingly, Cooch Behar which claims to be the most stable district with respect to gross value of output per hectare of aman and boro rice displays considerable degree of instability with regard to gross value of output per hectare of aus rice. Dinajpur district is found to be the most unstable one with respect to gross value of output per hectare of aus rice. Murshidabad is the most unstable district with respect to gross value of output per hectare of both aman and boro rice. Aus rice records the highest degree of instability in gross value of output per hectare whereas boro rice records the lowest degree of instability in this regard.

INTER-YEAR VARIABILITY IN THE HARVEST PRICE OF THREE SEASONAL RICE

Table 3 presents the extent of inter-year variability of harvest price of three types of seasonal rice grown in the districts of West Bengal.

Table 3: Extent of Inter-year Variability of Harvest Price of Aus, Aman and Boro Rice in West Bengal and Constituent Districts (1977-78 to 1997-98)

State/District	Aus rice		Aman rice		Boro rice	
	C.V.	Rank	C.V.	Rank	C.V.	Rank
West Bengal	52.20		49.32		51.88	
Burdwan	55.46	10	53.29	2	53.07	6
Birbhum	51.51	3	47.76	1	51.12	4
Bankura	51.32	1	53.52	3	53.74	7
Midnapur	51.34	2	53.62	4	50.60	3
Howrah	-	-	-	-	-	-
Hoogly	52.36	4	54.29	6	58.22	11
24-Parganas	53.48	5	53.76	5	54.00	8
Nadia	55.43	9	54.34	7	52.86	5
Murshidabad	56.11	12	59.68	11	55.78	10
Dinajpur	53.73	7	56.40	9	54.51	9
Malda	53.83	8	54.83	8	50.01	2
Jalpaiguri	56.00	11	-	-	-	-
Darjeeling	-	-	-	-	-	-
Cooch Behar	53.65	6	59.46	10	44.51	I
Purulia	-	-	-	-	-	-

In case of aus rice, the more stable districts with respect to gross value of output per hectare are Hooghly, 24-Parganas, Malda and Birbhum whereas relatively unstable districts are Cooch Behar, Midnapur, and Dinajpur. The districts of Cooch

Behar, Birbhum, Burdwan and 24-Parganas are relatively more stable with respect to gross value of output per hectare of aman rice but highly unstable ones are Bankura, Hooghly amd Murshidabad. The more stable districts with respect to gross value of output per hectare of boro rice are Cooch Behar and Malda and relatively more unstable ones are Hooghly, Bankura, Burdwan, Dinajpur and Murshidabad.

Table 3 shows that with respect to harvest price of aus rice, the most stable district is Bankura. Birbhum and Cooch Behar districts are the most stable districts with regard to harvest price of aman and boro rice, respectively. Murshidabad district claims to be the most unstable district with respect to harvest price of both aus and aman rice. In case of boro rice, however, Hooghly district is found to be the most unstable one with respect to harvest price followed by Murshidabad district. It is interesting to note that among the three seasonal rice, aus records the highest degree of instability not only with respect to yield and harvest price but also with respect to gross value of output per hectare.

The more stable districts with respect to harvest price of aus rice are Bankura, Midnapur and Birbhum whereas relatively unstable districts are Nadia, Burdwan, Jalpaiguri and Murshidabad. In case of aman rice, Birbhum records the lowest level of instability in harvest price and relatively higher level of instability is observed for the districts of Dinajpur, Coochbehar and Murshidabad. In regard to harvest price of boro rice, Bankura, Midnapur and Birbhum are the more stable districts, whereas more unstable ones are Nadia, Burdwan, Jalpaiguri and Murshidabad.

NEXUS BETWEEN INCOME INSTABILITY AND YIELD/PRICE INSTABILITY

Rank Correlation Co-efficients between the instability of gross value of output per hectare and yield rate and between the instability of gross value of output per hectare and harvest price are presented in the **Table 4** to examine the influence of yield rate and harvest price in shaping the instability of gross value of output per hectare of three types of seasonal rice grown in West Bengal.

Table 4: Rank Correlation Co-efficients between Instability of Yield rate and Gross Value of Output per Hectare and between Instability of Harvest Price and Gross Value of Output per Hectare of Three Types of Seasonal Rice Grown in West Bengal (1977-78 to 1997-98)

Co-efficient of Rank Correlation Between	Aus Rice	Aman Rice	Boro Rice
Instability of Gross Value of Output per Hectare and Instability of Yield Rate	0.73	0.65	0.27
Instability of Gross Value of Output per Hectare and Instability of Harvest Price	-0.02	0.25	0.78

The **Table 4** exposes a fair degree of concordance between the rankings of districts done on basis of instability of gross value of output per hectare and yield rate of both aus aman rice. In case of boro rice, however, such nexus is not strong. The nexus between instability of income and instability of harvest price, though observed to be feeble for both aus and aman rice, is evidently strong in case of boro rice.

With a view to assessing the role of yield instability in explaining the instability of gross value of output per hectare, percentage distribution of movements under uni-directional changes and opposite-directional changes of yield and harvest price for three types of seasonal rice is presented in the **Table 5**.

Table 5: Percentage Distribution of Years Under Uni-Directional Changes and Opposite-Directional Changes of Yield Rate and Harvest Price of Aus, Aman and Boro Rice in West Bengal and its Constituent Districts (1977-78 to 1997-98)

State/District	Percentage distribution of years recording								
	– ve movements of yield rate and harvest price of			+ ve movements of yield rate and harvest price of			Opposite directional movements of yield rate and harvest price of		
	Aus rice	Aman rice	Boro rice	Aus rice	Aman rice	Boro rice	Aus rice	Aman rice	Boro rice
West Bengal	0	10.00	5.00	55.00	40.00	55.00	45.00	50.00	40.00
Burdwan	6.25	15.38	6.67	50.00	38.46	60.00	43.75	46.16	33.33
Birbhum	0	15.38	9.09	60.00	46.15	45.45	40.00	38.47	45.46
Bankura	7.14	5.88	6.25	50.00	52.94	31.25	42.86	41.18	62.50
Midnapur	0	0	11.11	50.00	21.43	33.33	50.00	78.57	55.56
Hooghly	11.11	0	7.70	50.00	13.33	46.15	38.89	86.67	46.15
24-Parganas	0	6.67	5.56	46.15	33.33	22.22	53.85	60.00	72.22
Nadia	11.11	5.56	11.76	38.89	38.89	41.18	50.00	55.55	47.06
Murshidabd	0	0	5.88	43.75	26.67	47.06	56.25	73.33	47.06
Dinajpur	6.67	0	12.50	46.67	26.67	50.00	46.66	73.33	37.50
Malda	0	6.67	0	57.14	40.00	50.00	42.86	53.33	50.00
Cooch Behar	5.89	0	11.11	47.06	40.00	33.33	47.05	60.00	55.56

It needs to be noted that the positive movement of both yield and price is welcome to the farmers. The negative movement of both yield and harvest price is, on the other hand, unquestionably undesired by the farmers. The relative rates of change in yield rate and harvest price are important considerations for judging the desirability of opposite directional change of both these variables. In no case, however, opposite directional movement of both these variables would be less desirable than the negative movement of these two variables.

The dominant feature of the positive directional movement of yield rate and harvest price in aus rice is observed from the **Table 5.** In aman and boro rice, the opposite directional movement in yield rate and harvest price is found to be dominant. The minimum aggregate percentage of cases of +Ve and opposite directional movements of yield rate and harvest price for aus, aman and boro rice are 88%, 84% and 87% respectively. This broadly signifies that the rice-growing cultivators of West Bengal belonging to different districts are not seriously affected as a result of inter-year variation in harvest price and yield rate of aus, aman and boro rice as is usually thought of.

SUMMARY AND CONCLUSION

Among the three seasonal rice grown in West Bengal, aus records the highest degree of inter-year instability with respect to yield rate, harvest price and gross value of output per hectare. Incidentally, it may be noted that the average yield of aus rice is lower than that of either aman or boro rice. The lowest degree of inter-year instability with respect to yield rate and gross value of output per hectare is observed in the case of boro rice.

It is observed from the study that the district showing lower level of instability with respect to yield rate of a particular seasonal rice does not invariably display lower level of instability in terms of any other seasonal rice.

The relative frequency distribution of number of years under different directional movement of yield rate and harvest price broadly indicates that the farmers of West Bengal, in general, are not adversely affected to any considerable extent by the instability of the aforesaid two variables.

Instability of yield rate is observed to play a pivotal role in defining the extent of instability of gross value of output per hectare in case of aus rice as well as aman rice. In the case of boro rice, however, over-riding influence of harvest price in shaping the extent of instability of gross value of output per hectare is observed.

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CHANGING PATTERN OF CONSUMER EXPENDITURE IN WEST BENGAL A REGIONAL STUDY IN ALL-INDIA PERSPECTIVE

Sukla Saha (Mondal)* and Debasis Mondal**

Analysis of pattern of consumer expenditure in India and its variation over different regions, over different classes and also over time has been a subject of interest from late 1950s as the reports of the NSS started to come out on a regular basis. This paper tries to make such an analysis but with a different methodology for the period 1972-73 to 1993-94. It also tries to compare this pattern in West Bengal with that in all-India separately for the rural and the urban areas and also tries to make a comparison between rural and urban areas within West Bengal with the help of a dummy variable. Results show that for majority of items there exists significant difference between rural and urban areas. This difference in West Bengal exists for a larger number of items of expenditure. This paper tries to utilise data on consumer expenditure and prices of different items over different rounds simultaneously to examine the nature of price elasticity of demand for the items under consideration.

I

Analysis of consumer expenditure plays a crucial role in the study of economic development of a country. This analysis is performed with the data available from household survey (or from budget studies). In almost all countries household surveys are performed at the national and/or at the regional level on consumption, employment, literacy, fertility, mortality etc. A number of theories have also been developed for analysis of household survey data. Prais and Houthakker (1955) and Houthakker and Taylor (1970) have examined and developed a number of methodologies used in such analysis. A basic tool used for the analysis of consumer expenditure is the Engel curve that explains the relation between household expenditure on different items and their total income or total expenditure.

Analysis of consumer expenditure also involves estimation of demand function and projection of future demand, estimation of effect of household size, household composition (age, sex, etc.) on the pattern of consumer expenditure, regional and sectoral variation of such expenditure etc.

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In India the National Sample Survey Organisation (NSSO) conduct household surveys generally on yearly basis. The consumer expenditure survey constitutes a major part of the NSSO surveys. Up to 1970-71, i.e., up to the 25th round of NSS, survey of consumer expenditure was an integral part of household survey and a number of economists have used these data for both cross-section and time-series analysis of consumer expenditure. Mahalanobis used these data for regional and temporal comparisons of the pattern of consumer expenditure. Besides using Lorenz curve and Gini coefficient he has developed and used new tools like specific concentration curve (specific to a particular item) and fractile graphical analysis in his work. During 1960s and 1970s Iyengar (1963,1964,1967), Bhattacharya (1972,1978), Bhattacharya and Maitra (1969), Bhattacharya and Pal (1985), Chatterjee and Bhattacharya (1974), Vaidyanathan (1974), Jain and Tendulkar (1972), Coondoo (1972, 1974) Coondoo et al (1974), Roy (1973) and others have examined the pattern of consumer expenditure and its variation over different States, over different social classes and also over different income classes. Most of them are cross-section analysis. However, Bhattacharya and Maitra (1969) and Bhattacharya et al (1985) have made some time-series analyses also. The main findings of these authors are that there exist considerable variations in the pattern of consumer expenditure among different sections and also over time.

After 1970-71 the Govt. of India decided to conduct consumer expenditure survey on a broader basis (covering larger number of households) but at 5 year intervals. The first quinquennial survey on consumer expenditure (and on employment and unemployment also) was undertaken in the 27th round of NSS survey in 1972-73. The next four quinquennial surveys were conducted in 1977-78,1983,1987-88 and 1993-94 in the 32nd, 38th, 43rd and 50th rounds respectively. In the interim rounds there was no consumer expenditure survey except after 1985-86. From 1986-87(42nd round) onwards consumer expenditure surveys are being conducted on a very small scale (comprising only 1000 samples) in each round of survey in order to have a continuous series.

This paper tries to analyse the pattern of consumer expenditure in West Bengal using five quinquennial NSS survey data on household consumption. Plan of work in this paper is as follows:

In Section II average monthly per capita consumer expenditure (MPCE) and its distribution in West Bengal are analysed. Section III examines the nature of Engel ratios and its change over NSS Rounds in West Bengal vis-à-vis all-India. Section IV deals with Engel curves and Engel elasticities and tries to classify the

items in terms of Engel elasticities. In Section V the effects of change in relative prices of different commodities on item expenditure over NSS rounds are evaluated. Section VI summarises the finding and draws conclusion.

II

During 1972-73 the average MPCE in rural areas of West Bengal was only Rs.38.45 and in 1993-94 it increased to Rs.278.78 (vide Table 1). A part of this growth has been due to increased prices. The value of average MPCE in 1972-73 (27th round) is estimated to be Rs.199.94 at 1993-94 prices. Thus, the rate of growth of real MPCE in West Bengal rural is estimated to be only 1.74% per annum as compared to 9.97% for MPCE at current prices during this period (Table 2). Comparing these figures with those for All-India rural one observes that the MPCE in West Bengal was lower than that in India in 1972-73 (27th round) but has come close to it in the 50th round survey (1993-94). This is also reflected in the growth rates. While the annual growth rate of MPCE at 1993-94 prices is 1.74% for West Bengal rural, it is only 1.04% for all-India rural.

On the other hand, MPCE at 1993-94 prices in the urban areas of West Bengal has increased at a smaller rate of 0.6% per annum. In all-India urban areas the rate of growth of MPCE at 1993-94 prices is slightly higher than that in West Bengal.

Growth of MPCE at constant prices can not reflect a real development unless it is assumed that the distribution of MPCE over different classes has remained constant. But this distribution has actually changed in both rural and urban areas of West Bengal as observed form the values of Gini coefficient (Table1) .The inequality coefficient has fallen continuously in the rural areas and has fluctuated with a very minor reduction in the urban areas of West Bengal. Thus, in West Bengal rural inequality in the distribution of MPCE has come down. This is also substantiated by the real development Index (calculated by multiplying the average MPCE by the difference between 1 and G). The growth rate of development index is calculated to be 2.14% per annum in West Bengal rural where as it is only 1.26% per annum for all-India rural. A period wise analysis of change in the real development index shows that during the first five years (1972-73 to1977-78) it was 1.48% per annum for West Bengal as compared to only 0.5% per annum for India as whole. In next 10 years this growth rate in West Bengal rural and also in all-India rural has increased considerably, but during 1987-88 to 1993-94 this rate has fallen sharply in both West Bengal and all-India In the urban areas this growth rate was negative during 1972-73 to 1977-78 but has increased considerably in next 15 years in both West Bengal and all-India.

III

In Section II we have observed that in the rural areas of West Bengal the average MPCE at 1993-94 prices has increased from Rs.278.78 during 1972-73 to 1993-94. Accordingly the pattern of consumer expenditures over different goods & services has changed during this period. For convenience of analysis all goods and services are classified into 22 broad groups (including sub-total) and the percentage distribution of MPCE among these different items or the Engel ratios are calculated and presented in Table 3. The Table shows that the said percentage for total food has decreased from 77.4% in the 27th round to 66.8% in the 50th round. On the other hand, the percentage expenditure on non-food has increased steadily from 22.65 to 33.2% during the period.

Within the food group rice or other cereals, pulses and pulse products and sugar have shown decreasing importance in the total budget during this period. But the percentage expenditure on milk, edible oils, meat, egg & fish, vegeTables, fruits & nuts and beverages etc. have increased marginally during this period. But as the importance of these items in total budget of the households is small in absolute term, they could hardly reverse the declining trend in the total expenditure on food items. In the non-food group the increase in Engel ratio was basically due to the increase in the expenditure on foot wear, misc. goods and services, and durable goods.

It should be borne in mind that this continuous change in consumption pattern during these 20 years is not only due to an increase in average MPCE over time but also due to changes in preference pattern, changes in relative prices of different items and change in the availability of new products. However, if we compare these changes with the all-India average of rural areas, which are shown in Table 4, we observe a similar pattern of change in Engel ratios of different items. Except a few items like fuel & light, clothing, gram and cereal substitute the Engel ratios for all other items have exhibited a similar type of change. What is most important to observe from these two Tables is that the Engel ratio for food total was higher in West Bengal rural than in all-India rural in 1972-73 (consequently the ratio for non-food total in West Bengal rural remains higher than that for All-India rural in 1993-94 also but the difference between the two has decreased. Thus, changes in the pattern of consumer expenditure in favour of non-food items was stronger in West Bengal rural than in the rural areas of other States.

Engel ratios and their changes for different items in urban areas of West Bengal and All-India are shown in Table 5 and Table 6 respectively. In an overall sense the pattern and changes in Engel ratios are similar to that in rural areas but here the changes in West Bengal is weaker than those in all-India urban and this increases the gap between West Bengal and other States.

IV

Using the NSS it is of interest to observe how item expenditure varies with total expenditure, i.e., to estimate the so-called Engel curves and elasticities. Though various linear and non-linear forms of Engel curves can be used for estimating Engel elasticities, we have used the double-log-linear form or the constant elasticity form. For other forms elasticity varies from one point to another, and we have to measure elasticity either at the average values or we have to average elasticities at different points. However, both these methods are arbitrary and we have chosen the constant elasticity form $\log Y_{ij} = a + b \log X_j$ where Y_{ij} is the average expenditure of the persons in the jth expenditure class on the ith item, X_j is the average total expenditure of persons in the jth expenditure class and b_i is the Engel elasticity of the ith item. This curve is estimated for all items in West Bengal rural and urban and in All-India rural and urban with the help of weighted least squares method and with proportion of persons in different expenditure classes as weights.

This constant elasticity Engel curve is observed to give good fit for almost all items, over all rounds of NSS and for all four areas of West Bengal rural and urban and All-India rural and urban. Estimated Engel elasicities are presented in Table 7 through Table 10. Based on the values of Engel elasticities, items are classified into luxury, necessary/habitual or inferior depending on whether the elasticity is greater than one, less than one and less than zero respectively and this classification is presented in Table 11. Among food items milk and milk products, meat, egg and fish, fruits and nuts, sugar and beverages are found to be luxury items in rural areas of West Bengal as well as in those of All-India. Among non-food items clothing, footwear, miscellaneous goods and services and durable goods are found to be luxury items in both the areas. On the other hand, rice and rice products, cereals and cereal products, salt and spices, food total, fuel and light are found to be necessary and pan, tobacco etc. are found to be habitual items in the rural areas of West Bengal and All-India. However, other cereals and vegetables are found to belong to the class of necessary-cum-inferior items in West Bengal rural.

On the other hand, in the urban areas, while meat, egg and fish and pan, tobacco etc. have Engel elasiticities greater than one or fall in the category of luxury items in West Bengal, the first comes into the category of luxury-cum- necessary items and the second into that of necessary items in All-India. Moreover, while rice and rice products, and cereals and cereal products are found to be necessary-cum-inferior in West Bengal, they are found to be necessary items in All-India. One final point to note from all these Tables is that the Engel elasticities for a number of items like rice, cereals, pulses, milk, oil, beverages and food total have decreased over NSS rounds in all four areas.

To compare the pattern of consumer expenditure of West Bengal with that of All India or to compare that of rural with urban areas the dummy variable method is used. For example, to make rural urban comparison the following function is estimated.

$$Y_{ij} = a_{1i} + a_{2i}D + b_{1i}X_j + b_{2i}DX_j$$

Where D is the dummy variable which takes value 1 for rural and 0 for urban areas. After estimating this function with the help of weighted least squares method and t-test has been carried out for b_{2i} that makes any difference in the Engel elasticity between the rural and urban areas. Regression results comparing West Bengal with All-India rural and urban areas are not presented here, only the conclusions are presented in Table 12 and Table 13. Table 12 shows that in rural areas the Engel elasticities for other cereals and non-food total were low in West Bengal as compared to All-India in the 27th round, but from the 38th round onwards this difference between West Bengal and All-India has ceased to exist. On the other hand, the elasticities for fruits and nuts, beverages etc. footwear and miscellaneous goods and services were found to be higher in West Bengal rural than in All-India rural in some rounds of NSS . For urban areas the elasticity of cereal substitute is significantly low in rural areas of West Bengal in comparison to All-India and those for beverages etc. and pan, tobacco etc. are higher in West Bengal.

When the Engel elasticities of items in urban areas are compared with those in rural areas it is observed that for majority of items those elasticities are lower in rural areas both in West Bengal and All-India, but for items like beverages, pan, tobacco etc. fuel and light the elasticities in urban areas are significantly higher than those in rural areas mainly in West Bengal.

V

Analysis of pattern of consumer expenditure in single round can explain the nature of its variation between States, between rural and urban areas, among different social classes(if such data ate available) and most importantly between different expenditure classes, but the effect of changes in general price or relative price of different items or in average MPCE of all classes can be ascertained if more than one round is considered simultaneously. However, non-availability of price data on different items over different rounds and for different States makes it impossible to make such a comparison. Recently Jain and Minhas (1991) have published an article in Sarvekshana that gives such prices for 27th, 32nd and 38th rounds of NSS. Based on these data and other data for these three rounds, item expenditures are regressed on total expenditure relative price and general price (all in logarithms). The Engel elasticities estimated from these regressions are presented in Table 15. It can be

noted that these new estimates do not differ from our earlier estimates. However the coefficients of relative prices can give an idea about the price elasticities of the compensated demand curve (as the effect of change in total expenditure has been considered as a separate variable). Moreover, as we have considered the effect of change in relative prices on item expenditure, the effect may be positive, negative, or zero even if the elasticity is negative in all cases. Positive effects imply elasticity greater than one in absolute terms. Similarly negative effects imply inelastic and zero effects imply unitary elastic compensated demand. For items like milk, meat, fish and egg, pan, tobacco etc., vegetables and fruits, fuel and light etc. elasticity is less than or equal to one, but varies between rural and urban and also between West Bengal and All-India. For all other items elasticities are greater than one.

VI

Analysis of the pattern of consumer expenditure in the urban and rural areas of West Bengal shows:

(1) Average MPCE and its distribution over different income classes have improved considerably in rural areas during the first three subperiods (the period of 5 years in between two surveys) while both average MPCE and its distribution have not improved much in urban areas during the period. In the last subperiod the urban sector has shown more improvement as compared to rural areas and, in fact, the improvement in rural areas was almost nil.

(2) In comparison to All-India average these improvements in West Bengal are larger in both rural and urban areas. The difference is more significant in rural areas.

(3) Engel ratios explaining the pattern of expenditure on different items have gone in favour of non-food items over NSS rounds in both rural and urban areas of West Bengal and All India. In rural areas there was a difference between West Bengal and All-India. The weightage on food item was relatively greater in west Bengal. This difference has reduced in the subsequent period.

(4) Engel elastcities for pan, tobacco etc, beverages etc, and fuel and light were found to be high in urban areas of West Bengal in comparison to those in rural areas. For India as a whole, however, this is not significant.

(5) In urban areas of West Bengal the elasticities for pan, tobacco, beverages etc., were also larger than in urban areas of All-India.

(6) Price elasticities of compensated demand for milk, vegetables and fruits, meat, fish and egg, pan, tobacco etc. were not greater than one in rural areas and are

strictly less than one in urban areas of West Bengal. These products, however, have almost unit elasticities in both rural and urban areas of All-India.

All these and similar results can be used for future demand projections in India and in her different States separately for rural and urban areas. Data are also to be classified in terms of other bases so that a complete picture of demand/expenditure and its changes over time can be obtained.

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Table 1 : AVERAGE MPCE AND ITS DISTRIBUTION OVER NSS ROUNDS

WEST BENGAL: RURAL

NSS Rounds	Av. MPCE at Current Prices(Rs.) (1)	Av.MPCE at 1993-94 Prices(Rs.) (2)	Gini Coeff of MPCE (3)	Real Development Index (4)
27th	38.45	199.94	.305	138.96
32nd	59.27	214.03	.292	151.53
38th	104.60	239.61	.286	171.08
43rd	149.87	269.66	.252	201.71
50th	278.78	278.78	.251	208.81

ALL – INDIA: RURAL

NSS Rounds	Av. MPCE at Current Prices(Rs.) (1)	Av.MPCE at 1993-94 Prices(Rs.) (2)	Gini Coeff of MPCE (3)	Real Development Index (4)
27th	44.17	229.68	.298	161.24
32nd	68.89	248.77	.336	165.18
38th	112.31	257.27	.302	179.58
43rd	158.10	284.47	.291	201.69
50th	281.40	281.40	.282	202.05

WEST BENGAL: URBAN

NSS Rounds	Av. MPCE at Current Prices(Rs.) (1)	Av.MPCE at 1993-94 Prices(Rs.) (2)	Gini Coeff of MPCE (3)	Real Development Index (4)
27th	68.23	421.66	.338	279.14
32nd	97.13	382.89	.317	261.51
38th	169.94	407.07	.327	273.96
43rd	249.45	423.52	.353	274.02
50th	474.19	474.19	.333	316.28

ALL – INDIA: URBAN

NSS Rounds	Av. MPCE at Current Prices(Rs.) (1)	Av.MPCE at 1993-94 Prices(Rs.) (2)	Gini Coeff of MPCE (3)	Real Development Index (4)
27th	63.33	391.38	.341	257.92
32nd	96.15	371.38	.345	243.25
38th	165.80	397.15	.330	266.09
43rd	249.93	424.33	.352	274.97
50th	458.04	458.04	.340	302.31

Table 2 : ANNUAL GROWTH RATES OF AVERAGE MPCE AND REAL DEVELOPMENT INDEX.

	WEST BENGAL RURAL	ALL – INDIA RURAL	WEST BENGAL RURAL	ALL- INDIA URBAN
Av.MPCE at current prices	9.97%	9.21%	9.83%	10.02%
Av.MPCE at 1993-94 prices	1.74%	1.04%	0.67%	0.88%
Real Development Index	2.14%	1.26%	0.60%	0.87%

Table 2a : ANNUAL GROWTH RATES OF REAL DEVELOPMENT INDEX OVER NSS ROUNDS.

	WEST BENGAL RURAL	ALL – INDIA RURAL	WEST BENGAL RURAL	ALL- INDIA URBAN
From 27th to 32nd round	1.84%	0.51%	1.36%	1.2%
From 32nd to 38th round	2.23%	1.53%	0.85%	1.65%
From 38th to 43rd round	3.73%	2.61%	0.01%	0.73%
From 43rd to 50th round	0.58%	0.03%	2.42%	1.59%

Table 3: ENGEL RATIOS OVER NSS ROUNDS WEST BENGAL : RURAL

Percentage

No	ITEM	NSS ROUNDS				
		27TH	32ND	38TH	43rd	50th
1.	RICE & PROD	42.7	36	-	34.5	31.6
2.	OTHER CEREALS	7.8	6.1	-	2.7	2.3
3.	CEREALS & PROD.	50.0	42.3	45.0	37.3	33.9
4.	GRAM	0.0	0.1	0.0	0.0	0.1
5.	CEREAL SUBST.	0.1	0.1	0.1	0.0	0.0
6.	PULSES & PROD.	2.1	2.6	2.0	2.3	2.0
7.	MILK & PROD.	3.3	3.6	3.5	4.0	3.8
8.	EDIBLE OIL	3.8	4.7	4.0	5.3	4.0
9.	MEAT, EGG, FISH	4.3	5.8	5.4	7.1	6.6
10.	VEGETABLES	5.7	6.0	6.8	7.1	7.7
11.	FRUITS & NUTS	0.6	0.7	0.9	0.9	1.2
12.	SUGAR	2.4	1.8	1.7	1.7	1.6
13.	SALT & SPICES	2.1	2.8	2.1	2.4	2.2
14.	BEVERAGES ETC.	2.4	2.2	2.5	3.0	3.7
15.	FOOD TOTAL	77.4	72.7	74.0	71.0	66.8
16.	PAN,TOBACCO ETC	2.9	2.9	2.4	2.8	2.7
17	FUEL & LIGHT	5.0	6.0	6.2	7.3	7.0
18	CLOTHING	5.0	7.0	5.6	5.5	4.6
19	FOOTWEAR	0.1	0.3	0.5	0.5	0.6
20	MISC & SERVICES	8.5	7.5	10.0	10.3	16.6
21	DURABLE GOODS	1.1	3.6	1.2	2.5	1.7
22.	NON-FOOD TOTAL	22.6	27.3	26.0	29.0	33.2

Table 4: ENGEL RATIOS OVER NSS ROUNDS, ALL INDIA : RURAL

Percentage

No	ITEM	NSS ROUNDS				
		27TH	32ND	38TH	43rd	50th
1.	RICE & PROD	20.7	18.4	-	15.8	15.4
2.	OTHER CEREALS	19.9	14.4	-	10.5	8.8
3.	CEREALS & PROD.	40.6	32.8	32.3	26.3	24.2
4.	GRAM	0.6	0.4	0.3	0.2	0.2
5.	CEREAL SUBST.	0.5	0.3	0.2	0.1	0.1
6.	PULSES & PROD.	4.3	3.8	3.5	4.0	3.8
7.	MILK & PROD.	7.3	7.7	7.5	8.6	9.5
8.	EDIBLE OIL	3.5	3.6	4.0	5.0	4.4
9.	MEAT, EGG, FISH	2.5	2.7	3.0	3.3	3.3
10.	VEGETABLES	3.6	3.8	4.7	5.2	6.0
11.	FRUITS & NUTS	1.1	1.1	1.4	1.6	1.7
12.	SUGAR	3.8	2.6	2.8	2.9	3.1
13.	SALT & SPICES	2.8	3.0	2.5	2.9	2.7
14.	BEVERAGES ETC.	2.4	2.5	3.3	3.9	4.2
15.	FOOD TOTAL	72.9	64.3	65.6	64.0	63.2
16.	PAN,TOBACCO ETC	3.1	2.9	3.0	3.2	3.2
17	FUEL & LIGHT	5.6	6.0	7.0	7.5	7.5
18	CLOTHING	7.0	8.7	8.6	6.7	5.4
19	FOOTWEAR	0.5	0.7	1.0	1.0	0.9
20	MISC & SERVICES	8.7	10.3	12.5	14.5	17.3
21	DURABLE GOODS	2.2	7.0	2.3	3.1	2.7
22.	NON-FOOD TOTAL	27.1	35.7	34.4	36.0	36.8

Table 5: ENGEL RATIOS OVER NSS ROUNDS

WEST BENGAL : URBAN

Percentage

No	ITEM	NSS ROUNDS				
		27TH	32ND	38TH	43rd	50th
1.	RICE & PROD	15.3	16.2	-	14.4	13.7
2.	OTHER CEREALS	6.6	6.3	-	3.6	3.4
3.	CEREALS & PROD.	21.9	22.5	22.0	18.0	17.1
4.	GRAM	0.1	0.1	0.1	0.1	0.1
5.	CEREAL SUBST.	0.0	0.0	0.0	0.0	0.0
6.	PULSES & PROD.	2.5	2.9	2.1	2.1	1.9
7.	MILK & PROD.	6.8	6.6	6.2	6.5	5.9
8.	EDIBLE OIL	4.2	5.0	4.3	4.6	3.8
9.	MEAT, EGG, FISH	6.5	7.8	7.5	8.1	7.4
10.	VEGETABLES	6.2	6.1	6.2	5.9	6.4
11.	FRUITS & NUTS	1.4	1.3	1.4	1.6	1.9
12.	SUGAR	2.7	1.9	1.6	1.5	1.5
13.	SALT & SPICES	1.6	2.2	1.7	1.6	1.8
14.	BEVERAGES ETC.	10.4	6.9	7.6	7.5	8.1
15.	FOOD TOTAL	64.2	63.4	60.8	57.6	55.9
16.	PAN,TOBACCO ETC	3.2	3.1	2.8	3.5	3.0
17	FUEL & LIGHT	5.0	6.2	6.8	7.5	7.3
18	CLOTHING	5.0	6.3	6.5	6.8	4.9
19	FOOTWEAR	0.3	0.5	1.0	0.8	1.0
20	MISC & SERVICES	15.8	11.8	20.5	21.7	25.9
21	DURABLE GOODS	1.1	8.7	1.5	2.1	2.1
22.	NON-FOOD TOTAL	35.8	36.6	39.2	42.4	44.1

Table 6: ENGEL RATIOS OVER NSS ROUNDS, ALL- INDIA : URBAN

Percentage

No	ITEM	NSS ROUNDS				
		27TH	32ND	38TH	43rd	50th
1.	RICE & PROD	12.2	11.4	-	8.7	8.3
2.	OTHER CEREALS	11.1	9.1	-	6.3	5.7
3.	CEREALS & PROD.	23.3	20.5	19.4	15.0	14.0
4.	GRAM	0.3	0.3	0.2	0.2	0.2

5.	CEREAL SUBST.	0.1	0.1	0.1	0.1	0.1
6.	PULSES & PROD.	3.4	3.6	3.2	3.4	3.0
7.	MILK & PROD.	9.3	9.5	9.2	9.5	9.8
8.	EDIBLE OIL	4.9	4.6	4.8	5.3	4.4
9.	MEAT, EGG, FISH	3.3	3.5	3.6	3.6	3.4
10.	VEGETABLES	4.4	4.4	5.0	5.3	5.5
11.	FRUITS & NUTS	2.0	2.0	2.1	2.5	2.7
12.	SUGAR	3.6	2.6	2.5	2.4	2.4
13.	SALT & SPICES	2.3	2.7	2.1	2.3	2.0
14.	BEVERAGES ETC.	7.6	6.3	6.8	6.8	7.2
15.	FOOD TOTAL	64.5	60.0	59.1	56.4	54.7
16.	PAN,TOBACCO ETC	2.8	2.4	2.4	2.6	2.3
17	FUEL & LIGHT	5.6	5.4	5.9	6.8	6.6
18	CLOTHING	5.3	7.1	7.6	5.9	4.7
19	FOOTWEAR	0.4	0.6	1.1	1.1	0.9
20	MISC & SERVICES	19.2	14.6	20.5	23.2	27.5
21	DURABLE GOODS	2.2	8.9	2.3	4.1	3.3
22.	NON-FOOD TOTAL	35.5	40.0	40.9	43.6	45.3

Table 7: ENGEL ELASTICITIES OVER NSS ROUNDS
WEST BENGAL : URBAN

Percentage

No	ITEM	NSS ROUNDS				
		27TH	32ND	38TH	43rd	50th
1.	RICE & PROD	0.81	0.66	-	0.52	0.37
2.	OTHER CEREALS	0.03	0.03	-	0.32	0.35
3.	CEREALS & PROD.	0.67	0.56	0.65	0.51	0.37
4.	GRAM	-0.41	1.58	1.74	1.64	2.09
5.	CEREAL SUBST.	0.54	-0.84	0.26	0.45	-0.15
6.	PULSES & PROD.	1.41	1.34	1.21	0.93	0.94
7.	MILK & PROD.	2.98	2.75	3.00	2.20	2.37
8.	EDIBLE OIL	1.09	1.14	1.04	0.97	0.77
9.	MEAT, EGG, FISH	1.55	1.47	1.39	1.52	1.38
10.	VEGETABLES	1.04	1.04	0.93	0.81	0.76
11.	FRUITS & NUTS	3.08	2.40	2.27	2.16	2.19
12.	SUGAR	1.86	1.52	1.46	1.21	1.16
13.	SALT & SPICES	0.77	0.77	0.74	0.73	0.73
14.	BEVERAGES ETC.	1.64	1.45	1.60	1.51	1.36

15.	FOOD TOTAL	0.90	0.86	0.87	0.82	0.75
16.	PAN,TOBACCO ETC	0.85	0.87	0.84	0.79	0.70
17	FUEL & LIGHT	0.68	0.68	0.58	0.69	0.71
18	CLOTHING	2.28	2.18	2.33	2.22	2.47
19	FOOTWEAR	10.67	3.32	3.61	2.85	3.06
20	MISC & SERVICES	1.60	1.74	1.77	1.68	1.76
21	DURABLE GOODS	4.11	2.54	2.77	2.78	2.41
22.	NON-FOOD TOTAL	1.43	1.47	1.39	1.42	1.44

Table 8: ENGEL ELASTICITIES OVER NSS ROUNDS
ALL - INDIA : RURAL

Percentage

No	ITEM	NSS ROUNDS				
		27TH	32ND	38TH	43rd	50th
1.	RICE & PROD	0.54	0.49	-	0.39	0.25
2.	OTHER CEREALS	0.54	0.40	-	0.34	0.39
3.	CEREALS & PROD.	0.54	0.45	0.44	0.37	0.30
4.	GRAM	1.40	0.01	0.95	1.52	1.51
5.	CEREAL SUBST.	-0.20	-0.07	0.49	1.09	1.32
6.	PULSES & PROD.	1.19	0.95	0.88	0.76	0.67
7.	MILK & PROD.	2.31	2.13	1.97	1.89	1.84
8.	EDIBLE OIL	1.06	0.99	0.96	0.94	0.77
9.	MEAT, EGG, FISH	1.20	1.12	1.35	1.29	1.19
10.	VEGETABLES	0.83	0.77	0.77	0.74	0.66
11.	FRUITS & NUTS	1.68	1.56	1.73	1.75	1.68
12.	SUGAR	1.60	1.28	1.24	1.20	1.06
13.	SALT & SPICES	0.62	0.66	0.65	0.68	0.60
14.	BEVERAGES ETC.	1.31	1.32	1.49	1.45	1.34
15.	FOOD TOTAL	0.85	0.80	0.81	0.84	0.78
16.	PAN,TOBACCO ETC	0.92	0.85	0.91	0.31	0.83
17	FUEL & LIGHT	0.60	0.61	0.59	0.61	0.66
18	CLOTHING	2.32	2.13	2.39	2.34	2.48
19	FOOTWEAR	4.06	2.66	2.27	2.18	2.26
20	MISC & SERVICES	1.75	1.59	1.51	1.51	1.45
21	DURABLE GOODS	3.89	2.49	2.79	2.77	2.41
22.	NON-FOOD TOTAL	1.47	1.44	1.42	1.39	1.37

Table 9: ENGEL ELASTICITIES OVER NSS ROUNDS WEST BENGAL : URBAN

Percentage

No	ITEM	NSS ROUNDS				
		27TH	32ND	38TH	43rd	50th
1.	RICE & PROD	0.16	0.22	-	0.11	-0.02
2.	OTHER CEREALS	0.02	0.13	-	0.27	0.25
3.	CEREALS & PROD.	0.11	0.20	0.16	0.14	-0.02
4.	GRAM	1.35	1.25	1.24	1.59	1.00
5.	CEREAL SUBST.	0.02	-1.09	-0.72	-0.71	-0.11
6.	PULSES & PROD.	0.63	0.57	0.47	0.46	0.54
7.	MILK & PROD.	1.63	1.79	1.37	1.60	1.46
8.	EDIBLE OIL	0.72	0.78	0.75	0.74	0.69
9.	MEAT, EGG, FISH	1.31	1.35	1.25	1.19	1.14
10.	VEGETABLES	0.61	0.68	0.58	0.53	0.55
11.	FRUITS & NUTS	2.13	2.10	1.77	1.84	1.65
12.	SUGAR	0.55	0.75	0.68	0.81	0.70
13.	SALT & SPICES	0.47	0.55	0.58	0.58	0.64
14.	BEVERAGES ETC.	2.10	1.97	1.68	1.81	2.03
15.	FOOD TOTAL	0.80	0.78	0.74	0.76	0.72
16.	PAN,TOBACCO ETC	1.12	1.18	1.10	1023	1.01
17	FUEL & LIGHT	0.66	0.81	0.71	0.72	0.72
18	CLOTHING	1.99	2.04	2.22	1.87	1.95
19	FOOTWEAR	3.00	2.65	1.94	2.12	2.23
20	MISC & SERVICES	1.65	1.55	1.50	1.59	1.59
21	DURABLE GOODS	1.35	1.68	2.93	2.45	1.94
22.	NON-FOOD TOTAL	1.45	1.45	1.43	1.40	1.41

Table 10: ENGEL ELASTICITIES OVER NSS ROUNDS ALL INDIA : URBAN

Percentage

No	ITEM	NSS ROUNDS				
		27TH	32ND	38TH	43rd	50th
1.	RICE & PROD	0.28	0.26	-	0.21	0.18
2.	OTHER CEREALS	0.11	0.17	-	0.20	0.22
3.	CEREALS & PROD.	0.20	0.22	0.21	0.21	0.20
4.	GRAM	1.00	1.06	1.02	1.27	1.16
5.	CEREAL SUBST.	0.04	0.27	0.83	0.97	0.81

6.	PULSES & PROD.	0.73	0.70	0.60	0.63	0.53
7.	MILK & PROD.	1.53	1.54	1.28	1.29	1.25
8.	EDIBLE OIL	0.92	0.91	0.78	0.84	0.68
9.	MEAT, EGG, FISH	1.09	1.06	1.02	0.97	0.88
10.	VEGETABLES	0.85	0.83	0.75	0.78	0.69
11.	FRUITS & NUTS	1.82	1.61	1.54	1.53	1.43
12.	SUGAR	0.86	0.84	0.66	0.71	0.56
13.	SALT & SPICES	0.45	0.54	0.51	0.54	0.45
14.	BEVERAGES ETC.	1.66	0.76	0.74	0.77	0.73
15.	FOOD TOTAL	0.78	0.76	0.74	0.77	0.73
16.	PAN,TOBACCO ETC	0.93	0.83	0.83	0.80	0.71
17	FUEL & LIGHT	0.69	0.73	0.63	0.63	0.65
18	CLOTHING	2.36	2.19	2.26	2.13	2.17
19	FOOTWEAR	2.83	2.35	1.82	1.96	1.81
20	MISC & SERVICES	1.63	1.47	1.40	1.42	1.46
21	DURABLE GOODS	3.03	1.95	2.75	2.32	2.38
22.	NON-FOOD TOTAL	1.48	1.44	1.40	1.34	1.36

TABLE 11 : CLASSIFICATION OF COMMODITIES IN TERMS OF ENGEL ELASTICITIES

	WEST BENGAL RURAL	ALL INDIA RURAL	WEST BENGAL URBAN	ALL INDIA URBAN
LUXURY	MILK & PROD MEAT, EGG, FISH, FRUITS & NUTS, SUGAR BEVERAGES ETC CLOTHING FOOTWEAR MISC. & SERVICES DURABLE GOODS NON-FOOD TOTAL	MILK & PROD MEAT, EGG, FISH, FRUITS & NUTS, SUGAR BEVERAGES ETC CLOTHING FOOTWEAR MISC. & SERVICES DURABLE GOODS NON-FOOD TOTAL	GRAM MILK & PROD MEAT, EGG, FISH FRUITS & NUTS BEVERAGES ETC PAN, TOBACCO ETC. CLOTHING FOOTWEAR MISC. & SERVICES OURABLE GOOOS NON-FOOD TOTAL	GRAM MILK & PROD MEAT, EGG, FISH FRUITS & NUTS BEVERAGES ETC CLOTHING FOOTWEAR MISC & SERVICES DURABLE GOODS NON-FOOD TOTAL
NECESSARY/ HABITUAL	RICE & PROD CEREALS & PROD SALT & SPICES FOOD TOTAL PAN, TOBACCO ETC FUEL & LIGHT	RICE & PROD OTHER CEREALS & PROD VEGETABLES SALT & SPICES FOOD TOTAL PAN, TOBACCO ETC FUEL & LIGHT	OTHER CEREALS PULSES & PROD EDIBLE OIL VEGETABLES SUGAR FOOT TOTAL FUEL & LIGHT	RICE & PROD OTHER CEREALS CEREALS & PROD CEREALS SUBST PULSES & PROD EDIBLE OIL VEGETABLES SUGAR SALT & SPICES FOOD TOTAL PAN, TOBACCO ETC FUEL & LIGHT
INFERIOR	—	—	—	—
LUXURY OR NEC/HAB	PULSES & PROD EDIBLE OIL VEGETABLES	GRAM PULSES & PROD EDIBLE OIL	–	MEAT, EGG, FISH –
NEC/HAB OR INFERIOR	OTHER CEREALS CEREAL SUBST	.....	RICE & PROD CEREALS & PROD CEREAL SUBST	.....
OTHERS	GRAM	CEREAL SUBST	—	—

TABLE 12: ITEMS HAVING LOWER / HIGHER ENGEL ELASTICITIES IN WEST BENGAL IN COMPARISON TO ALL INDIA OVER NSS ROUNDS

NSS ROUNDS	ITEMS			
	SMALLER		LARGER	
	RURAL	URBAN	RURAL	URBAN
27TH	OTHER CEREALS** NON FOOD TOTAL**		FRUITS ETC ** BEVERAGES **	
32ND	OTHER CEREALS **	CEREAL SUB		BEVERAGES ETC PAN, TOBACCO ETC**
38TH		CEREAL SUB*	BEVERAGES FOOT WEAR	BEVERAGES ETC
43RD				BEVERAGES ETC *
50TH			MISC & SERV	BEVERAGES ETC *

Note : * Significant at 5% level of significance
** Significant at 1% level of significance

Table 13: ITEMS HAVING LOWER/ HIGHER ELASTICTTIES IN URBAN AREAS OF WEST BENGAL IN COMPARISON TO ITS RURAL AREAS

NSS ROUNDS	ITEMS		
	SMALLER	LARGER	
27TH	RICE & PROD** PULSES & PROD** EDIBLE OIL** VEGETABLES** SALT & SPICES** FOOT WEAR*	CEREALS & PROD** MILK & PROD** MEAT, EGG, FISH** SUGAR** FOOD TOTAL**	BEVERAGES ETC** PAN, TOBACCO ETC**
32ND	RICE & PROD** PULSES & PROD** EDIBLE OIL** SUGAR** FOOD TOTAL DURABLES GOODS**	CEREALS & PROD** MILK & PROD** VEGETABLES** SALT & SPICES** MISC & SERVICES**	BEVERAGES ETC** PAN, TOBACCO ECT** FUEL & LIGHT**

38TH	CEREALS & PROD**	PULSES & PROD**	PAN, TOBACCO ETC. **
	MILK & PROD**	EDIBLE OIL**	FUEL & LIGHT*
	VEGETABLES**	FRUITS & NUTS**	
	SUGAR**	SALT & SPICES**	
	FOOD TOTAL**	FOOT WEAR**	
	MISC & SERVICES**		
43RD	RICE & PROD**	CEREALS & PROD**	PAN, TOBACCO
	CEREAL SUBSTITURE	PULSES & PROD**	ETC. **
	MILK & PROD	EDIBLE OIL**	
	MEAT,EGG, FISH**	VEGETABLES**	
	SUGAR**	SALT & SPICES**	
50TH	RICE & PROD**	GRAM	BEVERAGES ETC**
	PULSES & PROD**	MILK & PROD**	PAN,TOBACCO ETC*
	VEGETABLES*	FRUITS & NUTS*	
	SUGAR**	CLOTHING	
	MISC & SERVICES**		

Table 14: ITEMS HAVING LOWER/HIGHER ELASTICITIES IN URBAN AREAS OF ALL INDIA IN COMPARISON TO ITS RURAL AREAS.

NSS ROUNDS	ITEMS		
	SMALLER	LARGER	
27TH	RICE & PROD*	OTHER CEREALS**	FRUITS & NUTS*
	CEREALS & PROD**	GRAM**	BEVERAGES ETC**
	PULSES & PROD**	MILK & PROD**	FUEL & LIGHT*
	SUGAR**	SALT & SPICES**	
	FOOD TOTAL	MISC & SERVICES**	
32ND	OTHER CEREALS**	CEREALS & PROD **	CEREAL SUBST*
	PURLSES & PROD**	MILD & PROD**	FUEL & LIGHT**
	SUGATR**	SALT & SPICES**	
	MISC & SERVICES**	DURABLE GOODS**	
38TH	CEREALS & PROD**	PULSES & PROD EDIBLE	CEREAL SUBST
	MILK & PROD**	OIL**	
	MEAT, EGG, FISH, **	FRUITS & NUTS **	
	SUGAR **	SALT & SPICES **	
	BEVERAGES ETC	PAN, TOBACCO ETC. **	
	FOOT WEAR**	MISC. & SERVICES**	

43RD	OTHER CEREALS**	CEREALS & PROD**
	MEAT, EGG, FISH*	SUGAR**
	SALT & SPICES**	DURABLE GOODS**
50TH	CEREAL SUBST	PURLSES & PROD*
	MILK & PROD	MEAT, EGG, FISH
	FRUITS & NUTS	SUGAR*
	SALT & SPICES**	PAN, TOBACCO, ETC
	FOOT WEAR	

Table 15: ENGEL ELASTICITIES FROM COMBINED DATA OF 27TH, 32ND & 38TH ROUND.

ITEM NO.	WEST BENG. RURAL	ALL INDIA RURAL	WEST BENG. URBAN	ALL INDIA URBAN
3.	0.63	0.47	0.19	0.21
6.	1.31	0.99	0.59	0.65
7.	2.91	2.12	1.70	1.40
8.	1.09	0.99	0.78	0.85
9	1.46	1.23	1.35	1.04
10 & 11	1.10	0.96	0.83	1.10
12.	1.59	1.35	-----	-----
13.	0.76	0.64	0.56	0.50
15.	0.88	0.81	0.79	0.75
16.	0.85	0.89	1.16	0.85
17.	0.64	0.60	0.75	0.67
18 & 19	2.31	2.30	2.18	2.23
22.	1.14	1.44	1.45	1.43

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Table 16: ITEMS FOR WHICH EFFECTS OF CHANCE IN RELATIVE PRICES ON ITEM EXPENDITURES ARE POSITIVE, ZERO OR NEGATIVE.

EFFECTS NO.	WEST BENGAL RURAL	ALL INDIA URBAN	WEST BENGAL URBAN	ALL INDIA URBAN
POSITIVE	CEREALS & PROD, PULSES & PROD EDIBLE OIL SUGAR SALT & SPICES FOOD TOTAL FUEL & LIGHT CLOTHING FOOTWEAR NON-FOOD TOTAL	CEREALS & PROD, PULSES & PROD EDIBLE OIL SUGAR SALT & SPICES FOOD TOTAL FUEL & LIGHT CLOTHING FOOTWEAR NON-FOOD TOTAL	CEREALS & PROD PULSES & PROD. EDIBLE OIL VEGETAVBLES & FRUITS SALT & SPICES FOOD TOTAL FUEL & LIGHT	CEREALS & PROD PULSES & PROD MEAT, EGG, FISH SALT & SPICES FOOD TOTAL CLOTHING & FOOTWEAR NON-FOOD TOTAL
ZERO	MILK & PROD. VEGETABLES & FRUITS	MILK & PROD EDIBLE OIL VEGETABLES & FRUITS PAN, TOBACCO ETC		MILK & PROD EDIBLE OIL VEGETABLES & FRUITS
NEGATIVE	MEAT, EGG, FISH PAN, TOBACCO ETC	FUEL & LIGHT	MILK & FROM MEAT, EGG, FISH PAN, TOBACCO ETC CLOTHING & FOOTWEAR NON-FOOD TOTALETC	PAN, TOBACCO FUEL & LIGHT