

**LABOUR SUPPLY FUNCTIONS AND REMITTANCE
BEHAVIOUR AMONG MIGRANT WORKERS IN
A SEASONAL INDUSTRY - CHAMBER BRICKS
MANUFACTURING UNITS IN
RURAL COIMBATORE**

**BY
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CERTIFICATE

This is to certify that the thesis entitled **“LABOUR SUPPLY FUNCTIONS AND REMITTANCE BEHAVIOUR AMONG MIGRANT WORKERS IN A SEASONAL INDUSTRY – CHAMBER BRICKS MANUFACTURING UNITS IN RURAL COIMBATORE”** submitted to the Avinashilingam Institute for Home Science and Higher Education for Women (Deemed University), Coimbatore, for the award of the Degree of **DOCTOR OF PHILOSOPHY IN ECONOMICS**, is a record of original research work done by **Tmt.K.ARULSELVAM**, M.A., Dip. Ed. (Madras), M.Phil. (Bharathiar) during the period of her study in the Department of Economics, Avinashilingam Institute for Home Science and Higher Education for Women (Deemed University), Coimbatore, under my supervision and guidance and the thesis has not formed the basis for the award of any Degree / Diploma / Associateship / Fellowship or similar title of any candidate of any University.

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19.8.02
Signature of the Guide

DECLARATION

I hereby declare that the matter embodied in the thesis entitled **“LABOUR SUPPLY FUNCTIONS AND REMITTANCE BEHAVIOUR AMONG MIGRANT WORKERS IN A SEASONAL INDUSTRY – CHAMBER BRICKS MANUFACTURING UNITS IN RURAL COIMBATORE”** is the result of investigation carried out by me in the Department of Economics, Avinashilingam Institute for Home Science and Higher Education for Women (Deemed University), Coimbatore, under the supervision of **Dr.G.RAMATHILAGAM**, M.A., M.Phil., Dip. Ed. (Madras), Ph.D. (Bharathiar), Professor, Department of Economics, Dean – Faculty of Humanities, Avinashilingam Institute for Home Science and Higher Education for Women (Deemed University), Coimbatore, and it has not been submitted for the award of any Degree / Diploma / Associateship / Fellowship of any other University or Institute.

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CHAPTER I

INTRODUCTION

I. INTRODUCTION

Enhancement of the quality of life of the people is the basic goal of economic development. The quality of life has several dimensions - a life free from want, ignorance, unemployment, disease, exploitation and pollution. One of the crucial determinants of quality of life is access to productive employment opportunities in terms of income and employment, security and working conditions.

Generation of adequate and sustained employment opportunities was the dominant development paradigm since the advent of planning in India. The opening statement of the First Five Year Plan (Government of India, 1951, P. 7) affirmed that the purpose of development was to raise living standards and open out to people new opportunities for a richer and more varied life. However, with the steady decline in the growth of the formal sector following the structural adjustment programme, a large section of the growing labour force has been relegated to the unorganised or informal sector. In 1990s, the size of the informal sector both in the rural and urban areas, had expanded (Liedham and Mead, 1998). Hence the declining absorption of labour force in the formal sector, informalisation and casualisation of employment, inter and intra regional migration of workers and their implications became the central themes of research and discussion at different levels (Jayadevan, 1996 ; NSSO, 2000 and Vanamala, 2001).

Among these issues, the causes and consequences of migration have been a major concern of scholars as well as policy makers.

Migration is either internal or international, temporary or permanent, seasonal or non-seasonal, individual or collective. It reflects an expectation of an individual that he will be better off at the point of destination than at the point of origin. Migration of labour contributes to economic and social development by enabling labour to overcome the 'tyranny of space'. Gaonkar (1998) views it as an equilibrating process. It brings about improved relations between quantity of labour and its physical environment ; reduces disparities between communities or regions in different stages of development ; stimulates increase in overall productivity of the resources of a region or a country ; and promotes more trade between two regions differing substantially in factoral structure.

According to 1991 Census, the extent of internal migration, that is, those who were enumerated at a place different from their place of birth constituted 27.4 percent of the total population. The number involved in internal migration had steadily increased from one decade to another. The population recorded as internal migrants in 1961 census was 144.8 million ; in 1997 census, it was 166.8 million and in 1981 census, it was 195.8 million.

Though migration literature has focussed on the long duration rural to urban migration, circulatory rural to rural migration is also equally

important. The rural areas have emerged as the major source and destination of the migrants, observed Srivastava (1998). As per Census 1991, 70.5 percent of the internal migrants were in the rural areas. Rural to rural flows accounted for 64.2 percent for all migrants, while rural-urban and urban-urban migrants were 17.7 percent and 11.7 percent respectively. The relative importance of migration for economic reasons viz., employment and business reasons within the overall migration stream, also increases monotonically with the distance of migration. Srivastava (1998) has indicated the rate of male migrants for economic reasons to be 23.3 percent of all intra-district migration, 41.3 percent of inter-district migration and 54.9 percent of inter-state migration. In effect a great deal of circular migration takes place within the rural areas themselves.

Srivastava (1998) had observed that it is not labour scarcity alone that attracts labour migration into an area. It takes place equally into both labour-scarce as well as labour-surplus regions. One of the causes of increase in labour migration to both types of areas was the emergence of capitalist organisation of agriculture with the advent of green revolution which made the farmers depend on labour supplies from far off regions in times of peak demand. Later, they realised that it also worked as a labour control strategy that helped them in disciplining the local labour. Eventually, the migrant labour was extensively used in several non-agricultural activities also such as brick-kilns, tobacco processing,

charcoal making, road construction, quarries and fish processing. All these enterprises regardless of their location either in labour scarce or labour surplus regions employed a large number of inter and intra-state migrants. Srivastava (1998) highlights that brick kilns are on the top of this list of non-agricultural activities.

The National Commission on Rural Labour (1991) had characterised migration, particularly circular migration, as essentially a distress phenomenon undertaken for the sake of basic survival or subsistence. It denotes extreme economic and social hardship faced by labourers in rural areas. It is undertaken mostly by landless or land poor, unskilled and illiterate workers. The calculus of costs and benefits behind an individual's decision to migrate strictly involves getting the discounted value of present and future economic benefits in the place of destination in excess of the package of economic benefits that he can hope to enjoy in his place of origin (Passaris, 1999). The pecuniary costs include, for instance, opportunity costs, transportation and relocation costs and any capital gain or losses associated with the liquidation of fixed assets. The non-pecuniary or psychic costs may include the break in social and family ties, the sentimental cost of leaving one's childhood and home town memories behind. These factors may be considered very important particularly by the people in the older age group and large families. Likewise, non-pecuniary benefits influencing one's migration decision may include a more stable employment environment, a more enhancing social

and cultural atmosphere, better medical facilities and services, better schooling facilities and so on. Over and above all these, it is differences in economic advantages which, according to Hicks (1932) are differences in wages, that cause migration.

The potential migrant views migration essentially as investment for the future, in the sense that the benefits arising out of it will outweigh the costs associated with it over a lifetime. Theoretically, he is supposed to take a long term view of the costs and benefits of migration. Yet, a constraining feature is that future cannot be predicted with certainty and without a high degree of error. Therefore, in studies that explore the determinants and decision of migrants, a significant weightage is attached to information based on past and current economic conditions.

The subject of remittances is inseparable from the subject of migration such as the number and characteristics of migrants. Both migration and remittances are considered as vehicles of individual and household prosperity. Though parts of migrating family are geographically separated, still, for all purposes, they are part of an economic households that make consumption and income decisions jointly and not individually (Knowles and Anker, 1977). Since a migrant continues to consider his family as a source of economic security, emotional satisfaction and tangible assets, he feels that he is under an obligation to send remittances to the family members whom he has left behind in the home area. Thus

remittances which are an offshoot of migration become a crucial component of a longer term understanding between a migrant and his family. Glytos (1993) observes that the flow of remittances depends jointly on the capacity of migrants to remit to the family left behind (supply) and on the claim of the family on the income of their migrated members (demand). Supply, he says, is constrained by the level of migrants' savings and demand is enhanced by the needs of the family. Earlier researchers had underlined the need for a study on the factors influencing the marginal propensity of the migrants to remit (Johnson and Whitelaw, 1974). Thus the issue of the flow of remittances shifts the focus of the migration theory from individual independence to mutual inter-dependence (Stark and Bloom, 1985).

The process of theorisation, on migration began in the 19th century with Ravenstein's (1885) laws on migration. Sociologists, geographers, and economists have, respectively, emphasised social, cultural and economic factors as causes of migration (Gill, 1998). The sociologists have examined the factors influencing the individual and household decisions on migration. They have focussed on demographic (age, sex, education, marital status, household size and composition), geographic (distance), social, psychological (better amenities), economic (income and occupation) and attitudinal (economic status, income, being close to relatives) characteristics to explain migration flows. The focus of the geographers was on the spatial pattern and direction of movement and

distribution of population. Economists have concentrated on the role of wages, expected income differentials and levels of employment and unemployment influencing migration flows (Oberai and Billsborrow, 1987).

Studies on the determinants of migration have been based on two approaches : the neo-classical micro economic theory and the new economics of migration. In the neo-classical micro economic research (Sjaastad, 1962 and Todaro, 1969) a potential migrant goes where the expected net returns (expected earnings minus costs) to migration are the greatest and expected earnings is the product of the region's or sector's earnings and employment rates. According to this approach, individuals from a particular region may be pulled to migrate due to individual human capital characteristics such as education, skills and experience that enhance their probability of better employment in the destination.

The new economics of migration (Stark and Bloom, 1985) views migration decisions as being taken by larger associations of related people-families or households-rather than autonomous individuals. The collective decisions of migrants are not only made on the basis of expected income but also to minimise and diversify risks to family income through intersectoral movement even in the absence of wage differentials. Thus, even if wage differentials across sectors are eliminated, migration can continue (D'Souza, 1998).

Sahota (1968), Levy and Moses (1967) and Greenwood (1968, 1977) have found the degree of urbanisation in the destination as an important factor behind the inter-regional migration, urbanisation being associated with more employment opportunities and better infrastructural facilities. Studies by Yashwant (1962) and Connel et al (1976) have made a note of the higher proportion to migrate among middle income group rather than in the lower and upper income groups. Many studies found 'distance' to be an important factor for migration (Moses, 1967 ; Sahota, 1968 and Kishore, 1998). Increased distance raises transportation and psychic costs. The importance of the informal sector as a major source of employment for migrants was recognised by Todaro (1969). Migrants either work in small family-owned enterprises or become self-employed in a variety of activities ranging from work of carpenters and street vendors to personal servants. Informal sector accommodates workers who are non-salaried, casual labour, self-employed, sub-contracted, piece rate, temporary or part-time. So migrant workers get easily absorbed into this sector (Srinivas, 2002).

Earlier research on migration explained migration behaviour in developing countries in terms of the push-pull factors : push factors being the distress factors which drive an individual away from his home area and pull factors being those that attract him to a select place of destination. Harris-Todaro (1970) model have emphasized the difference between rural earnings at the place of origin and the expected value of urban

income as the driving force behind migration. Hoselitz (1973) maintained that unfavourable employment condition in rural areas caused the process of migration. Chakrapani and Mitra (1995) have brought out the importance of employment in non-household manufacturing sector in determining the migration of rural people. An increase in the rural manufacturing employment discouraged out-migration from rural area while a rise in urban employment encouraged in-migration in urban areas.

A considerable amount of the reported research on migration had concentrated on migration trends and had been done on macro level data (Sahota, 1968 ; Murthy and Murthy, 1980 ; Mitra, 1992 ; Rao, 1996 ; Sensarma, 1997 ; Singh and Aneyetei, 1997 ; Kolhi and Kothari, 1998 ; Misra, 1998 ; Bora, 2000 ; Ghaffari and Singh, 2000 ; Dewan, 2001). Some studies have been done on households in the sending area (Krishnaiah, 1997 ; Misra, 1998 ; Topal et al., 1999 ; Agesa, 2001 ; Boyle et al., 2001 ; Cerruti and Massey, 2001 ; and Umarani and Shylendra, 2001). Very few studies have concentrated on the migrant people in the destination area (Tiwari, 1981 ; Reddy, 1991 ; Tanner, 1991 ; Chand et al., 1998 ; Patrick, 1998 and Gupta and Mitra, 2002). Only a few studies have attempted to analyse the factors behind the flow of remittances from the migrants to home area (Chaudhuri, 1993 ; Santhapparaj, 1998 ; Shah, 1998 and Duraisamy and Narasimhan, 2000). These studies really miss out on how migrant population performs vis-a-vis the local population in terms of its labour supply to the market and the

wage differentials that may exist between these two groups. The issue of the effects of migration on the well being of the households that had sent out people has not been addressed adequately.

The current study on **“Labour Supply Functions and Remittance Behaviour among Migrant Workers in a Seasonal Industry – Chamber Bricks Manufacturing Units in Rural Coimbatore”** is an effort to fill this gap. It focuses on a select group of migrant workers in the brick manufacturing units which employ them on an extensive scale. It attempted to

1. identify the factors influencing their decisions to migrate ;
2. find out their determinants of their wage rates ;
3. study the determinants of the labour supplied by them in terms of their annual days of employment ; and
4. find out their remittance behaviour as a two part problem – the first order decision involving the factors influencing their decision to remit and the second order decision involving the factors influencing the amount remitted by them to their family members in the home area.

The specific hypotheses tested in the study were :

- Migrant workers differ from non-migrant workers in that they are younger, single and unmarried, not very educated and come from landless or land poor households and have relocated from areas where there was a large incidence of unemployment.
- The wage rates or earnings of workers in the brick manufacturing units are a function of their age and potential experience. Given other things, the migrant workers tend to have higher earnings than non-migrants as they bring with them the skills and ability to be trained which are to the advantage of the employer.

- The labour supply behaviour is a positive function of the wage rates for all the groups of workers.
- Health status is a determinant of labour supply function in so far as workers in the brick manufacturing units are exposed to hazardous conditions.
- The decision to remit and factors influencing the amount remitted are sequential decisions, with the set of factors influencing the first decision being different from the set of factors influencing the second decision.
- Workers remit more, when they have more binding ties with the home area in terms of their intention to go back, number of children and other dependents left behind by them and the fixed assets at the place of origin.

The study was done in the period April – August 2001, on a sample of 1050 workers of whom 700 were migrant workers and 350 were local workers who constituted the control group for the study. They were drawn from among the workers in 500 brick manufacturing units in Perianaickenpalayam Block of the Coimbatore district. These workers were selected using the cluster sampling procedure which involved systematic the random selection of 50 brick manufacturing units in the first stage and all the workers employed in them were interviewed for the study in the second stage, subsequently. Since the dependent variables studied the decision to migrate, the decision to remit - were binary in character, taking the value one or zero for the individual and a fraction for the group, the maximum likelihood estimation procedures were used to estimate the co-efficients of the Logit and Tobit models. The wage and labour supply functions were estimated in the two-stage least square frame work. An

attempt was made to correct for selectivity bias involved in sample selection by estimating the inverse of Mill's ratio.

The investigator strongly believes that such group-specific studies of migrant population when replicated over workers in several sectors will highlight the crucial contribution that the migrants make to specific industry and also the circumstances in which they find themselves which may call for specific interventions on the part of the policy makers. The findings of the study will incidentally improve the data base of the informal sector workers in the economy.

CHAPTER II

REVIEW OF LITERATURE

II. REVIEW OF LITERATURE

The literature pertaining to the topic on **“Labour Supply Functions and Remittance Behaviour Among Migrant Workers in a Seasonal Industry – Chamber Bricks Manufacturing Units in Rural Coimbatore”** is presented and discussed under the following heads :

- A. Emergence of Informal Sector
- B. Migration Behaviour : Theory and Evidence
- C. Determinants of Labour Supply : Theory and Evidence
- D. Remittance Behaviour : Theory and Evidence

A. Emergence of Informal Sector

Most of the developing countries are confronted with the problems of employment creation and income distribution. Despite their best efforts, “the scope for generating major increase in industrial employment in large scale manufacturing remains limited” (Hajela and Goswami, 2000). Employment in organised sector has been declining since the last 20 years and the Structural Adjustment Programme (SAP) has worsened this trend (Liedham and Mead, 1998). The rate of employment creation resulting from the growth of output in the modern formal sector has failed to keep pace with the high and rising rates of unemployment and hence an informal sector has emerged in its own right (Meier, 1984). It has emerged as a residual sector of employment and output readily absorbing all kinds

of labour including migrant labour. In India, the informal sector or the unorganised sector plays a vital role in the employment and production front. Around 92 percent of the workforce including those employed in agriculture, are in this informal sector. More than 60 percent of the national income is generated in the informal segment in India (Kulshreshtha, 1998).

The characteristics that distinguish the informal sector from the formal sector are : “easy of entry, reliance on indigenous resources, family ownership of enterprises, small scale operations, labour-intensive and adapted technology, skills acquired outside the formal school system and unregulated and competitive market” (Meier, 1984). The formal sector is characterised by difficulty in entry, large investment, corporate ownership, large scale operations, capital intensive and often improved technology, formally acquired skills and protected markets through tariffs, quotas and trade licences.

The concept and extent of informal sector in the Indian economy has been studied extensively by Hart (1973) ; Papola (1980) ; Anand (1991) ; Tiwari (1991) ; Das (1996) ; Narasimhan, (2000) and Kishore (2000). These studies indicate that a large segment of informal workers are employed not only in agriculture but also in non-agriculture and tertiary activities.

B. Migration Behaviour : Theory and Evidence

The role of internal migration, defined in terms of movement of people across the smaller units within a country in the process of economic development, is widely recognized. Rural-urban migration is both a symptom of changes in the productive structure and a contributing factor to such change (Standing, 1984). Social scientists who have assessed the phenomenon are divided in their views on the impact of migration. Lewis (1954) states that mobility is a necessary part of economic growth ; it is an equilibrating force, it facilitates industrialisation ; improves income distribution and it induces technological changes in agriculture. Against this, is the other view of Myrdal (1966) is that the departure of comparatively more resourceful, skilled and educated people from rural to other areas is a loss of scarce entrepreneurial and innovative talent. Mobility involves a sizeable transfer of human capital out of the rural sector and this might adversely affect agricultural production and incomes and thus increase rural inequalities. So, an understanding of the causes and determinants of migration in particular, rural-urban migration and rural-rural migration becomes essential.

A large and growing literature in both developed and developing countries deals with the causes and consequences of internal labour migration. Most of them had adopted some version of a human capital approach as shown in the survey of Halfacree and Boyle (1993). They

have found that individual and family moves are motivated by economic criteria. In short, movement is regarded as a response to job related constraints at the place of origin and/or perceived job related opportunities or incentives at the place of destination (Johnson and Salt, 1990 ; Gorden, 1992, 1995 and Green, 1992).

The dominant theory of migration at the individual level is neo-classical in approach which posits that rational actors migrate because the cost-benefit calculation leads them to expect positive net return from international / intranational movement (Borjas, 1989 and Todaro, 1976). Migration is conceptualised as an investment in human capital ; people move to places where they can be more productive, given their skills (Sjaastad, 1962) ; yet, before they can reap the higher wages associated with greater productivity, they must pay the cost of travelling, looking for work, adapting to a new labour market, and cutting old ties (Todaro and Maruszko, 1987). Potential migrants estimate the costs and benefits of moving to alternative locations, and go where the expected net returns are the highest (Borjas, 1989, 1994).

The new economics of labour migration assumes that household members act collectively not merely to maximise expected income but also to overcome various market failures (Stark, 1991 and Taylor, 1986, 1987). In the absence of efficient insurance markets, households reduce risks by diversifying the allocation of their workers across labour markets (local,

national and international). They use internal and international migration to accumulate cash in the form of remittances and savings.

Researchers who take a structural perspective tend to interpret migration as a household survival strategy (Simmons, 1983). The concept of survival strategy within this approach is a way of focussing attention on the poverty of many migrants and on the fact that their movement often results from deteriorating employment and income conditions in rural areas.

Roldan (1988), Grasmuck and Passar (1991) and Repak (1995) have challenged the idea that household members co-operate rationally in developing economic strategies : they argue that this view overestimates family's capacity to define objectives, evaluate means and undertake actions. More specifically, it ignores conflicts of interest and power within the household. As Ridey and Gardner (1993) observed, "In reality, household strategies are more likely to derive from decisions made by the most powerful household members, decisions that, by affecting all household members, irrespective of their involvement in the decision making process may give rise to dissent or resistance". The decisions about who migrates and why migration takes place is determined not only by the gender division of labour within households, but also by the structure of opportunities available to both men and women, particularly labour market opportunities.

The literature on migration in developing countries is based on the four basic theories relating to the determinants of migration : Ravenstein's (1885) law of migration, Lee's (1966) theory of migration and rural-urban labour transfer models (Lewis, 1954) and expected income differential model (Todaro, 1969, 1979).

The migrants move from areas of low economic opportunities to areas of high opportunity. The choice of destination is regulated by distance in the sense that the migrants from rural areas first move to nearby towns and then to large cities (Ravenstein, 1885). Building on Ravenstein's law of migration, Lee (1966) developed a general framework for analysing the internal migration process. According to him, every case of out-migration involves an origin, a destination and an intervening set of obstacles. He categorised the factors influencing the migrant perception into 'pluses' 'zeros' and 'minuses'. While 'pluses' pull the individuals towards them, 'minuses' drive them away. The 'zeros' refer to competing forces which are more or less evenly balanced.

Lewis (1954) model which is based on the concept of dual economy, comprising a subsistence agriculture sector and a modern sector ; rural, urban migration acts as a balancing factor by transferring manpower from low income activities of rural sector to high income activities in urban sector and thus narrows down the rural-urban gap. Its central assumption are that the faster the rate of capital accumulation, the

higher will be the growth rate of modern sector and the creation of new jobs ; 'surplus' labour exists in rural areas while there is full employment in the urban areas and that constant real urban wages continues until the point where the supply of rural surplus labour is exhausted.

Todaro's (1969) model lays down that migration is stimulated primarily by rational economic considerations of relative benefits and costs, mostly financial but also include psychological ; the decision to migrate depends on 'expected' rather than actual rural-urban wage differentials and probability of successfully obtaining employment in the urban modern sector ; and that the probability of obtaining an urban job is inversely related to the urban unemployment rate.

In the context of these theoretical dimensions, a number of empirical studies have been undertaken by experts from different fields like economics, sociology and demography both at national and also at district levels.

Krishnaiah (1997) analysed the issues of tied migration system namely, the contract migration system and united migration system, that is, casual migration. The study was confined to two-villages of Andhra Pradesh, which were semi-arid backward regions. The study made an attempt to enquire into the factors determining the participation of a labourer in the contract migration system by adopting logit model. The analysis revealed that marital status, per capita income, per capita land

availability and dependency ratio of the households were found to be significantly influencing the decision of households to send their members into contract migration. For casual migration system, it was found that age, sex, marital status, over due amount paid and unemployment had impact on the decision of a migrant to move out ; male workers migrated out in larger number than female workers ; married persons were more likely to move out rather than the single, widowed or divorced persons and higher the unemployment rate faced, the higher the chances of household members migrating out.

Sensarma (1997) in his study on "Migrant labour in urban areas : Dimensions and determinants" examined the various aspects of the issue of migration in general and migration of labourers in urban areas of India in particular, using the information of NSS 43rd round on internal migration and population figures of 1991 census, covering 14 states in India. The study used ordinary least squares technique in estimating migration functions. The analysis explained 51 percent to 53 percent of rural-urban migration and 67 percent of migration between urban area. Marriage and associational morbidity were reported as the most significant factors behind migration into urban areas. Urban tertiary sector employment was a very crucial pull factor behind both rural to urban and urban to urban migration. The significant role of urbanisation, reflecting increasing job opportunities and a greater availability of infrastructural facilities in cities, in explaining urban to urban migration was very evident in the study. The

study concluded that rates of migration are still slow in India but, given the sluggish absorption rate in the urban industrial sector, the absolute number of migrants is quite large.

Singh and Aneyetei (1997) in their study on "Information gathering prior migration and land factor in family migration decisions : Some evidence from a western Sub-saharan African Region", attempted to evaluate the effects on the households' migration decisions of (1) the family farm size in relation to the households' active labour supply (2) information supply about migration (3) level of schooling. Data for the study were collected from randomly selected sample of 105 farm households from seven villages during period 1979-1981. The study revealed that male adult members moved out first ; and 70 percent of the migrants were from households that farmed less than five hectares of land. The scarcity of good quality farm land and low demand for labour services in the family farm provided strong incentives to seek employment. The regression results also highlighted that information supplied to households played an effective role for worker to enhance the ability of farm works. Further, households' prior migration variable, and the location variable exercised positive effect on migration. It was further noted in the study that migration contributed to farm household income and welfare through cash remittances and gifts in kind tend to maintain constant linkages with their families in the villages.

Chand et al. (1998) attempted to study the socio-cultural and economic background of the migrant labour working in the sugar industry in their paper on "Socio-economic variables and process of migration in sugar industry of Punjab". The study also analysed the local labour in the above regard using a field survey conducted in four sugar mills of Punjab, covering a sample of 240 workers including 160 migrant and 80 local workers. The study observed that push factors like unemployment and poverty played a dominant role in motivating migration. Due to the nature of sugar industry, the majority of migrant workers were skilled or semi-skilled seasonal permanent workers with an average annual stay of three to five months in Punjab. Most of the single migrants to Punjab were found to be regularly remitting money to their families. All the migrants were found to be males and most of them were Hindus and belonged to backward castes as well as upper castes. The migrants covered in the study had rural background and a majority of them had small land holding which were the main additional source of income.

Kohli and Kothari (1998) in their study on the "Trends and dimension of urban labour migration in Western India", focussed on an analysis of urban labour migrants. The study covered six adjoining states of Western India ; the data used were information from 43rd Round Survey of NSS, Census of India (1991) and Economic Survey (1996-97). The findings of the study showed that migration in the individual states, region as a whole and in India was low but the destination area was not

able to provide requisite facilities to the in-migrants. In general, migration into the rural areas was less than into urban areas with female migration dominating over male migration. The distance covered by the migrants was turned out to be the most important factor in migration decisions. Other factors influencing the migration decisions were poverty, establishment of non-household industry, the difference of industrial income and level of urbanisation.

Singh and Agarwal (1998) in their study on "Rural-urban migration the role of push and pull factors" tried to identify the set of economic variables which were responsible for rural-urban migration. The study was based on cross-sectional data collected from Population Census 1991 and Statistical Abstract of Uttar Pradesh for 25 districts of north-western Uttar Pradesh. The ordinary least square model has been applied to analyse the factors accountable for rural-urban migration. The results of the study indicated that literacy played a very important role in out-flow of rural males. Rural industrialisation was found as one of the important factors responsible for checking the outflow of rural population and the percentage of urban workforce engaged in non-household urban manufacturing and construction activities was also a significant factor in pulling the rural people into the urban area ; the decline in the available average size of operational holdings, and lack of irrigational facilities in the rural area appeared to be the most significant push factor in rural-urban migration. The study indicated that in order to control the unbalanced flow

of workers into the urban sector, better employment prospects and educational opportunities at the place of origin be provided. So, to reduce out-flow of rural people, more schools and colleges of good quality may be established. Launching of Non-farm employment projects in the rural areas by the government with a stress on the expansion of major and minor irrigation projects, which may create employment opportunities and also check outflow of rural population to urban areas, may be launched.

Topal et al. (1999) conducted a study in Kumaun hills of Himalayas to understand causes of the out-migration and its socio-economic implications particularly on the remaining population. The study reported that in the process of a migration, lack of employment opportunities and alternative sources of livelihood, insufficient cultivable land, poor farm productivity and inaccessible infrastructure facilities were some of the main push factors ; the pull factors identified in the study were support by kith and kin, access to modernity and better quality of life. It was found that 72.09 percent and 27.91 percent of migration was influenced by the impact of push and pull factors respectively.

Ghaffari and Singh (2000) attempted to identify the most important push and pull determinants of inter-provincial migration in Iran based on the data collected from 1996 Census for 25 provinces of Iran. The study applied the OLS regression model to examine the impact of different variables on inter-provincial migration. They concluded that the most

important variables influencing the variation in province's out-migration were percentage of irrigated area and mechanisation. The roles of industrialisation and general literacy were not found to be significant. The most significant explanatory variables for province's in migration were access to modern amenities and mechanisation. Both unemployment variable and the industrialisation variables were insignificant in explaining the variation in in-migration.

Umarani and Shylendra (2001) analysed the nature and extent of migration over two time periods, the migrants' activities, and their working and living conditions at the place of migration in their study on "Seasonal migration and rural-urban interface in semi-arid tropics of Gujarat : A study of a tribal village". The data for the study were drawn from household surveys carried out during 1993-94 and 1996-97 in a rural village. The pilot survey covered 316 sample households and second survey pertained to 45 households. The study indicated the main reason for seasonal migration was both push and pull factors. The push factors were weak resource base, inadequate food and income from agriculture, decline in the per capita availability, disappearance of forests, increasing pressure of population, limited employment opportunities. The pull factor was basically the alternative employment opportunities available mainly in growing urban area. Based on the magnitude and extent of migration, the study reported that on an average 2.2 persons per household migrated. The migration was circulatory in nature and was the dominant mode of migration.

Most of these studies have focussed mainly on the trends and magnitude of internal migration based on secondary information collected from census reports. The studies reviewed indicated various reasons that had motivated people to migrate. They included lack of adequate land for cultivation, meagre income from existing land holdings, inadequate employment opportunities and conditions, poverty, rural illiteracy and lack of employment opportunities in the non-farm sector in rural areas.

C. Determinants of Labour Supply : Theory and Evidence

Labour, like capital, can be defined either as a stock of productive instruments at a point of time or as a flow of services yielded by these instruments over time (Raynolds et al., 1991). In the stock sense, labour is the totality of people counted in the labour force, with whatever skills or productive capacity they possess at the moment. In a flow sense, labour is the number of worker-hours / days available for production over a period of time.

To the classical economists, discussion of labour supply was concerned with the forces that determine the size of the population of working age and especially, the effect of changes in real wages on the growth of the population. As Rees (1973) states, the amount of labour supplied by a given population depends on four factors : (1) the labour force participation rate or the fraction of the population engaged in seeking gainful employment ; (2) the number of hours people are willing to work

per week or per year while they are in the labour force ; (3) the amount of efforts workers put forth while at work ; (4) the level of training and skill that workers bring to their jobs.

An individuals' labour supply depends on his or her preferences for market income versus leisure or home production. Labour supply decisions are also affected by income and substitution effects: As a person's income rises, the worker can afford to work fewer hours-an income effect. But as the persons' wage rate rises, the opportunity cost of working fewer hours also increases - a substitution effect.

Micro economic analysis of labour supply is based on the neo-classical theory of utility maximisation (Ashenfelter and Heckman, 1974). In this frame work, the family is assumed to be maximising its utility of welfare subject to a number of constraints.

The decision to work is ultimately a decision about how to spend time. One way to use one's available time is to spend it in pleasurable activities. The other major way in which people use time is to work. One can work around the home, performing such household production as raising children, or even growing food (Bowen and Finegan, 1969). Alternatively, one can work for pay and use one's earnings to purchase food, shelter, clothing and child care. As working for pay and engaging in household production are two ways of getting the same jobs done, decision to work can be characterised as a choice between leisure and

working for pay. Since the amount of discretionary time spent on leisure is time not spent on working and vice versa the demand for labour can be considered the reverse side of the coin labelled supply of labour.

The labour force participation rate is generally higher for men than for women, but within each sex, there is substantial variation by age and the age pattern for men and women are highly dissimilar (Rees, 1973). To explain these patterns of participation, how decisions about the use of time are made within the household by an individual worker becomes very important.

Since most people live in families or households rather than as single individuals, decisions about who is and who is not in the labour force as well as the related decisions about how many hours of work they would like to supply are best viewed as decisions about the household that divides its total available time between market work and non-market activities (Becker, 1965). Whether the members of the household make these decisions collectively or individually or whether the head makes the decision for the whole household is also considered an important issue.

Decisions about the allocation of time will reflect the total resources of the household, of which the most important are the time of household members of working age and the households' income from sources other than work (non-labour income). These decisions reflect also the opportunities for market work available to members of the household,

including their potential market wage, their comparative advantages in non-market activities and the amount and nature of household work that needs to be performed. An increase in the family's resources, unaccompanied by any other changes in opportunities such as an inheritance that substantially increases non-labour income should reduce total labour supply. The expectation that a rise in non-labour income tends to reduce participation in the labour force is the assumption that, for at least some members of most households, more leisure is preferred to some portion of current market work and that the higher non-labour income will make it possible to engage in more in the preferred activity. A rise in the wage for the market work, open to some members of the household may induce more participation by these members.

Bardhan (1979) analysed the labour supply function for rural Bengali women. The data of this study were obtained from 8,500 workers belonging to 4,690 households, drawn from 500 sample villages of West Bengal. The data referred to the period October 1972 to September 1979, and were drawn from the NSSO. The results suggested that labour supply was positively related to number of dependents, low caste families, district development index, widowed women and with busy season. It was negatively related to number of adult males in the household, village unemployment, slack season and family's standard of living. One of the interesting findings was that labour supply was sensitive to social,

economic and demographic constraints and was not responsive to wage rate.

Sarfraz (1979) conducted a study to identify the determinants of paid employment of Pakistani Women. The data for the study were drawn from micro level investigation, on a sample of 1000 respondents, of which 222 were working women. Labour supply was measured in two ways viz., labour participation as a dummy variable and hours of work supplied to the market. The results indicated that income of the family and total number of children were negatively associated with work participation while education had a positive impact. One of the contrary findings was that children below five years had a positive impact on mother's work participation.

Greenbalgh (1980) estimated the labour supply function for the married women of Great Britain. The study was based on the data drawn from the 1971 General Household Survey. By using the OLS regression, labour force participation and hours of work supplied by married women to the market were analysed. The results of the study showed that wage had a direct impact on labour participation.

Children in the age groups of 0-2, 3-5 and 6-10 years had an indirect impact on mother's work participation. But children above 10 years had a positive impact on mother's work participation. The number of dependents above 60 years had a negative impact on the probability of work participation. In the case of hours of worked supply to the market

wife's wage, children above 10 years had a positive impact on mother's work participation. The number of dependents above 60 years had a negative impact on women's labour participation. The age of the wife had a positive impact on the probability of work participation.

Layard et al. (1980) examined the labour force participation and hours of work supplied to the market for US married women. The analysis was based on a sample of 3,877 families. The data were drawn from the General Household Survey conducted in US in 1974. The sample comprised both time series and cross-section data. Tobit, Logit and OLS techniques were applied to estimate the determinants of the labour supply decision and hours of work. The results of the study revealed that own wage had a positive impact on the probability of work participation. Income of the husband and unemployment of the husband had negative but insignificant impact on the work participation decision. Children under the age groups of 0-2, 3-5, 6-10, 11-13 years had negative impact on the probability of mother's work participation. Unearned income was negatively associated with the probability of work participation. The total number of children had a positive impact on the probability of work participation. The annual hours of work was positively associated with the wife's wage and it was negatively related with the total number of children, young children and household wage.

Hill (1983) made an attempt to analyse the factors that determined the labour participation of the women belonging to Tokyo metropolitan area. The sample of 1037 women in the age group of 20-59 years was divided into three categories (i.e.) as an employee, working as a family worker and not working. The data for the study were collected in 1975. Maximum likelihood Logit Model was applied to estimate the dichotomous labour participation model. The study showed that years of schooling, husband's income and house ownership had negative impact on the probability of work as an employee. The wage had a positive impact on likelihood of work as an employee. The wage rate in the family sector had a negative impact on the probability of work in that sector. Husband's income had a direct impact on the probability of work in family sector. Schooling had a positive impact on the likelihood of engaging in family work.

Khandker (1987) by using the multinomial logit frame work analysed the labour supply of rural Bangladeshi women. The data were drawn from a survey of 444 respondents administered in eight taluks of Bangladesh during 1983 and 1984. Data under this study had been classified into three exclusive groups ; groups not producing cash income, that producing cash income in family enterprise and that producing cash income outside the family enterprise. The results revealed that the work participation of rural married women in Bangladesh was not responsive to 'local customs' but partially influenced by economic constraints, wife's

education, school distance, wife's wage and age. Husband's education, pre-marriage asset and household current holdings had a significant negative impact on the probability of labour market participation for producing cash income. Urbanisation had a negative impact on the probability of labour market participation. One of the findings of the study was that children's income had no impact on mother's choice for work pattern, which was contrary to the expectation.

Jhangir (1990) studied the muslim women workers of West Bengal. He analysed the type of occupations pursued by them, reasons for working, attitudes towards work and relationship between work participation and status in the family. The study was based on the primary data collected from the urban and rural areas of Murshidabad Districts of West Bengal. The sample consisted of 299 observations, comprising of 98 working and 201 non-working muslim women. The working women were classified in the three groups on the basis of age viz., (i) 18-27 years, (ii) 28-37 years and (iii) 38 and above years. The study revealed that economic or poverty conditions forced women to take up market work. Education was positively associated with work participation. One of the interesting findings of this study was that the muslim men of Murshidabad district had a favourable attitude towards work participation of their women. Women, irrespective of place of residence, education and occupation, revealed that their work participation raised their position both within the family and outside.

Using the cross-section data drawn from a primary survey of households of Madras city, Malathi (1991) estimated wage and labour supply functions of married women. The data for the study were collected from 244 working and 422 non-working women in 1981. Labour supply was measured both in terms of labour participation and 'hours of work supplied to market'. The analysis was carried out by adopting the techniques of Tobit, probit and OLS method. The results revealed that wife's education, age and wage rate had a positive impact on labour participation, husband's wage, asset income, children below seven years and children in the age group of 8-19 had a negative impact on the probability of labour participation. Labour supply was found to be sensitive to husband's wage, non-earned income. Children had a negative impact on annual hours work supplied to the market, while education and wage rate had a positive and significant impact on annual hours of labour supplied.

Nirmala et al. (1992) made an attempt to identify the factors that governed the work participation decision of married women of Pondicherry region. The total sample of this study was of 250 observations in which 125 from each urban and rural region. The data of this study were collected through field survey during April 1990 and 1991. Both OLS and Tobit techniques were used to estimate the results and the two techniques did not reveal much difference in their decision for work participation. It was evident from the study that urban, rural and pooled

sample, the decision to participate in market work with regard to personal and economic variables like age, own wage, husband's earning and asset income, did not differ. The influence of child variables was, however, governed by regional opportunities and constraints.

Nirmala and Kamaiah (1993) estimated a model of labour supply of wives with living husbands in Pondicherry region, under the framework of labour leisure model. This study was based on a sample of 200 observations, 100 from the urban and an equal number from the rural areas of Pondicherry. The study was restricted to working women only and based on a primary survey conducted in 1990-91. Labour supply was measured in terms of annual hours of labour supply to the market. The analysis suggested that husband's earnings and other income variables were negatively associated with labour supply of wife in case of the urban and total samples. The impact of children in the age group 6-15 and above 15 years had a negative but insignificant effect on labour supply. Age of the youngest child and number of dependents were positively associated with wife's labour supply. The age of wife had a positive impact in the initial and negative impact in later phase of life in the case of urban and pooled sample. The study also found a negative impact of own wage on labour supply.

Russel and Peter (1993) estimated the labour supply behaviour of single mothers and married mothers of Australia using the data based on

the 1986 income distribution survey. This study was based on 3202 mothers, out of whom 2841 were married at the time of survey and 361 of them were sole mothers. The results showed that when the age of the youngest reached above five years the mothers of both the categories increased their entry into the labour force. In case of sole mothers when the youngest child reached fifteen years and above they further increased their participation rates. The impact of age on participation decision indicated that it was positive up to the age of forty five and after that their participation declined. Education had a positive but experience had a negative impact on participation decision. The results also revealed that sole mothers were more responsive to transfer payments and non-wage income when compared to married mothers. These incomes had a major negative impact on their participation decisions. In the case of the labour supply behaviour of actually employed women, pre-school children did not have any significant impact on employment. Children between 5-9 years of age did not show any impact either. But the experience of the mothers had a positive impact on their employment.

Kamaiah et al. (1999) examined in their study, the relationship between labour supply, fertility and wage among married women, in a case study of Muslims of Hyderabad city. The required data for the study were collected through a primary survey during July-August 1993, from a sample of 160 married women with living husbands drawn from different parts of the city of Hyderabad. Half of the sample consisted of working

women. The results based on two stage least square method and three stage least square methods showed that wife's education, her wage, age of husband, husband's income, education, employment status, number of children in the age group of 0-5, and fertility were the proximate determinants of work participation and labour supply. Fertility was determined by factors like the number of dependents, desire for male child, work participation, nature of family, husband's income and education, woman's wage, total child income, etc. wages on the other hand, were influenced by her age, education, fertility, work experience and place of work. The study concluded that work participation / labour supply, fertility and wage behaviour relating to women should not be studied each in isolation, but together by considering the interdependence that may exist among these variables in the light of economic, social and demographic features.

Using a rural household survey on 1820 household from Sichuan province of China, Zhao (1999) in his study on "Labour migration and earnings differences : The case of rural China", found that rural labourers earned much higher incomes as migrants than they did as workers in local non-farm and farm sectors. The differences in earnings were derived from examining household earnings and labour inputs from migrants, local non-farm workers and farm workers. Less than a third of the difference was accounted for by explicit costs of migration, such as transportation and urban housing. Logistic probability models showed that the decision to

migrate was driven largely by the availability of rural non-farm employment opportunities. If these jobs were available, even at significantly lower wages, rural people chose to stay in rural areas rather than to migrate under current regulation and condition. According to his study, a major deterrent to migrate, was the lack of safety during transportation and in destination cities as well as forced separation from families, as large part of these problems arose from the fact that rural migrants were denied the legal right to reside permanently in cities.

The neo-classical household utility maximization theory continued to be the basic frame work of all reported research on labour supply. In short, these studies on labour supply had by and large related to female labour supply rather than to male labour or migrant labour supply, as against Greenbagh (1980), Layard et al. (1980) and Malathy (1991), who found that wages had a direct and positive impact on women's labour participation. Bardhan (1979) and Nirmala and Kamaiah (1993) found evidence to the contrary. Family assets which proxied for family income or unearned income also was negatively associated with work participation in Hill (1983) and Khandker (1987) and Malathy (1991). Children constituted constraints on the economic choice of the household members, yet only in Sanfraz's (1979) study, the number of children was negatively associated with work participation. In Greenbagh's (1980) study, they had a positive impact on women's participation, Kamaiah (1991) reported that wage was positively related to age and workers participation.

Lisa et al. (2001) in their study on "Education and labour market participation of women in Asia : Evidence from five countries" contributed to the understanding of household decisions of women's labour market participation in Asian societies. First, the possible impact of women's education on their labour market participation decisions were discussed within the context of a collective model of household bargaining. Second, an empirical analysis of the determinants of participation of married women was carried out through the use of household-level data from Indonesia, Korea, Philippines, Sri Lanka and Thailand. This cross-country analysis using comparable data allows for the comparison of the determinants of women's participation in countries with different income levels, stages of development, and cultural characteristics.

The empirical results indicated that the determinants of women's LFPRs in Asia vary dramatically across countries. Tertiary education was found to have a large impact on participation in all countries except the most developed country, Korea, where women's education has very little effect on participation. In contrast, primary and intermediate education was found to have little impact on participation except in Indonesia, where the effect of intermediate education was positive, and in Sri Lanka, the effect was negative. The evidence indicated that there was not a single relationship between women's education and labour force participation in Asia. The relationships vary significantly by country. Therefore, it is important to consider the cultural context when trying to predict the effect

of policies that increase women's education levels on women's participation in the labour force. In countries with more traditionally defined gender roles, like Korea and Sri Lanka, increase in women's education levels are unlikely to boost women's labor force participation rates. However, in countries where gender roles are less rigidly defined, like Thailand and the Philippines, there is likely to be a stronger relationship between women's education and labour force participation.

D. Remittance Behaviour : Theory and Evidence

The analysis of remittance behaviour by the households is based on the neo-classical utility theory. Knowles and Ankar (1977) have stated that income transfer affect both inter-household and intra-household allocation of resources. Remittances associated with migration have been cited as the key benefit for the area of origin not only by replacing foregone incomes but also by augmenting savings, investment and technological innovations (Chaudhuri, 1993).

Internal and external migration can have a profound impact on rural asset accumulation in most third world countries. In many African, Asian and Latin American countries, the bulk of the labour force still lives in the countryside (Adams, 1998). In these countries, the large difference between expected rural and urban or foreign incomes, coupled with the risk reducing functions of migration, causes workers to migrate, either to urban centres or abroad. The remittances, defined as the money or goods

sent home by migrant workers, can have a large effect on the accumulation of assets in the rural areas. For example, an inflow of external remittances to rural households at the upper end of the income distribution could increase land accumulation by the rich and cause income inequalities (Stark, Taylor and Yitzhaki, 1986).

Previous research on remittances has ignored two important questions:

- (1) Though considerable variation has been observed in the proportion of migrants' remitting, it is not known whether the factors which determine the decision to remit differ from the factors which determine the size of remittance flow from those remitting.
- (2) Previous studies (Rampel and Lodbell, 1978) of remittances have usually been limited to rural-urban migrants. Yet, the number of rural-rural migrants is considerably larger than the rural-urban migrants in many developing countries and large transfer flow other than urban to rural remittance may occur in many developing countries.

The existing literature on the issue of remittances by migrants (Stark, 1980 ; Lavhari, 1982 and Zachariah et al., 2002) indicates that very little attention has been focussed on the question of marginal effects of remittances on household consumption and investment in the rural areas. This inattention has been due to three considerable methodological

problems (Adams, 1998). The first is fungibility ; as remittances are like any other form of cash income, it is difficult to associate this income source with any particular changes in household expenditure behaviour. The second problem relates to the multiple round effects of remittances on the local economy. For example, an inflow of remittances into a rural area may lead to a surge in expenditure in housing, which may, in turn, create new income and employment opportunities for the poor and the unskilled. A few studies (Taylor, 1992 and Lipton, 1980) have evaluated the second and third order effects of remittance expenditure on wages and employment. They maintained that out-migration is likely to lead to a worsening of income distribution and in net terms, the remittances are either very small or go disproportionately to these better off. As Appleyard (1989) observed, "the research that has attempted to determine how remittances are invested tends to be poorly devised and lack theoretical underpinning". One particular difficulty in this context is that much of the remittance research is based on data gathered at one point of time ; such research is unable to measure the various ways in which remittances get invested in different rural assets over time. Owing to these interrelated problems many studies on remittances have not focussed on the economic impact of remittances. These studies (Lipton, 1980 and Whitelaw, 1974) often found that the bulk of such income transfers is spent on consumption and not on investment in rural areas.

Studies on the remittance behaviour of migrants pose a number of issues for further research, like what is the time path of remittances ? to what extent do remittances affect distribution of income ; whether remittances are a payment to relatives or for past expenditures incurred on migrants' behalf ; whether investment opportunities affect remittances and whether there is a cycle of remittances whereby newly arrived migrants remit very little while more established migrants remit less, the longer they reside away from home (Knowles and Anker, 1981).

The motives for remitting, according to Lucas and Stark (1985), are as follows : Pure altruism, pure self-interest and enlightened self interest. Using the classical utility maximisation framework, Lucas and Stark (1985) showed that the amount of remittance depends on the income of the migrant, income per capita and the household size. The individual may be motivated for remitting because he would like to support his family, particularly, parents or for inheritance or for investing in assets in the place of origin and finally, for maintaining contacts to return home for settling.

An alternative theory put forward by Stark and Lucas (1988) considered remittances as the self-enforcing co-operative contractual arrangements between the migrant and the family. Thus the pure altruism and contractual arrangement theories emphasised the migrant family ties while the self-interest and contractual arrangements model rely on

inheritance and risk taking behaviour as the major factor influencing the remittance behaviour of the migrants.

Knowles and Anker (1981) reported a descriptive and analytical evidence on the characteristics and determinants of remittances and transfer in Kenya in their study on "An analysis of income transfers in a developing country". The study utilised data from a survey of households in Kenya (International Labour Office / University of Nairobi Household Survey, 1974). The study indicated that income transfer were limited to members of the nuclear family ; the income transfers from urban to rural areas, accounted for the largest flow with 50.4 percent of all income transferred. Among rural households, there was a clear tendency for transfers sent to increase with income and the income transfers were seen to be an important source of income for the lowest rural income group. The regression analysis indicated that the decision to make transfers was positively and significantly related to income, education, urban residence, male sex, migrant status, ownership of a house in the home area and household members residing away. The amount of income transferred by household was found to be positively and significantly related to urban residence, migrant status, education, income and the number of children residing away. There were no differences among determinants of amount remitted between rural and urban households.

Johnson and Whitelaw (1988) in their study on "Urban-rural income transfers in Kenya : An estimated remittance function" found out that urban-rural income transfers represent about a fifth of the urban wage bill in Kenya, as the analysis showed that the amount which the individuals transferred was systematically related to income and other socio-economic variables. Families which had a member employed in a regular urban job had a ready source of information on new job opening ; and this member could influence the employment decision in favour of other family members. Further, an employed member of the family could provide funds for the education of his younger brothers and sisters, which, in-turn, gave them a greater chance of obtaining high-wage position. In their study remittances as one of the components of a long term understanding between a migrant and his or her family which include many aspects like education of the migrant, coinsurance and inheritance. The family group as a whole can potentially gained from such arrangements. Empirical illustration from the study indicated that having been educated by the family, the migrant gains from higher wages ; the family gains assurance in undertaking riskier agricultural activities, as the migrant will support them during drought and sons in the hope of maintaining favour in ultimate inheritance. Migration, thus, was an intertemporal proposition generating streams of various benefits to both migrants and their families.

Glytoss (1993) made an attempt to provide an overall picture of individual and aggregate income effects of remittances using the case of

Greece as an example, in his study on “Measuring the income effects of migrant remittances”. The study indicated that the individual pattern of consumption of remittance the recipients improved greatly as did the local standard of living in areas of heavy migration, as the recipients shifted to more urbanised consumption habit. At the aggregate level, remittances did not seem to have the power to impose any serious burden on the balance of payments despite their strong import generating effect. On the contrary, remittances promoted economic growth, employment and capital formation.

Changrang and Nangia (1997) in their study on “Emigration from Kerala : Characteristics of migrants and their contribution to household economy” found that totally 19.3 percent of migrant households purchased assets or property from remittances received ; a majority of these households invested remittance in house, land and gold / jewellery. Remittance receiving households exhibited better standard of living and differences were observed in the standard of living between rural and urban households.

Duraiswamy and Narasimhan (1998) conducted a study on “Migration, remittances and family ties in urban informal sector”. The study examined the urban-to-rural remittance behaviour of the migrants in the urban informal sector using a primary survey data from the Chennai metropolitan area. The theories of remittance are presented and the

implied hypotheses were specified and tested empirically. Two factors viz., family ties and inheritance emerged as the key determinants of the remittance. The data showed that about 69 percent of the migrants remitted about 18 percent of their income. The empirical results provided evidence of the positive association between migrant family ties and remittances. Theories of remittance pointed to the fact that there are three motives of remittance, namely altruism, self-interest and contractual arrangements. The share of urban income remitted had a strong relationship with the indicators of family ties. A strong positive relationship was also observed between remittance and the number of school going children in the origin and the intention to return home. The more the number of family members associated with the migrants, the less was the amount remitted. If the migrant had landholdings at the origin he was motivated to remit a larger position of his income.

In an empirical analysis on "Internal migration, remittance and determinants of remittance", Santhapparaj (1998) examined the factors influencing the decisions of the individuals to remit money to the place of origin and also the variables which have a significant influence on the amount remitted. The analysis on probability of remittance by the migrant to the rural area showed very poor probability. Only unmarried migrants and those who had assets in the form of land or house had a higher probability to remit. Further, the analysis on the amount of remittance and its determinants showed that the decision to send remittances and the

amount of remittance are independently determined. The closeness of ties with the rural areas for various reasons like presence of close relatives, possession of land or house etc., had a strong influence on the decision to remit. The purpose of remittance did not support the view that it helps to promote rural development.

These reported studies highlight that remittance behaviour of migrants and migrant households could be assessed in two ways regarding the set of factors influencing the decision to remit and factors determining the amount of remittance. Family based variables like marital status, number of children and dependents left behind in the place of origin, kind of property possessed and the number of school going children at the destination places, exerted influence on the decision to remit by the migrants and the amount remitted by them.

CHAPTER III

METHODOLOGY

III. METHODOLOGY

The methodology adopted in the current study on “**Labour Supply Functions and Remittance Behaviour Among Migrant Workers in a Seasonal Industry – Chamber Bricks Manufacturing Units in Rural Coimbatore**” is presented and discussed under the following heads :

- A. Locale of the Study Area
- B. Sampling Procedure and Data Collection
- C. Theoretical Model
- D. Econometric Estimation and Issues
- E. Terms and Concepts
- F. Limitations of the Study

A. Locale of the Study Area

Coimbatore District is one of the thirty districts of the state of Tamil Nadu. It is bounded by the Nilgiris in the North, the Western ghats side of Kerala in the West, the tobacco and vegetable district of Dindigul in the South and highly agriculturally commercial turmeric district of Erode in the East (Vide Fig. 1). It lies between 10° – 10' and 11° – 30' latitude and 76° – 40' and 77° – 30' longitude. It is spread over an area of 7469 km² with a population of 35,08,374 (Census 1991) making it the most advanced district in the state. It has also the distinction of being one of the ten most industrialised districts in the country (Annual Credit Plan -

MAP OF COIMBATORE DISTRICT

50

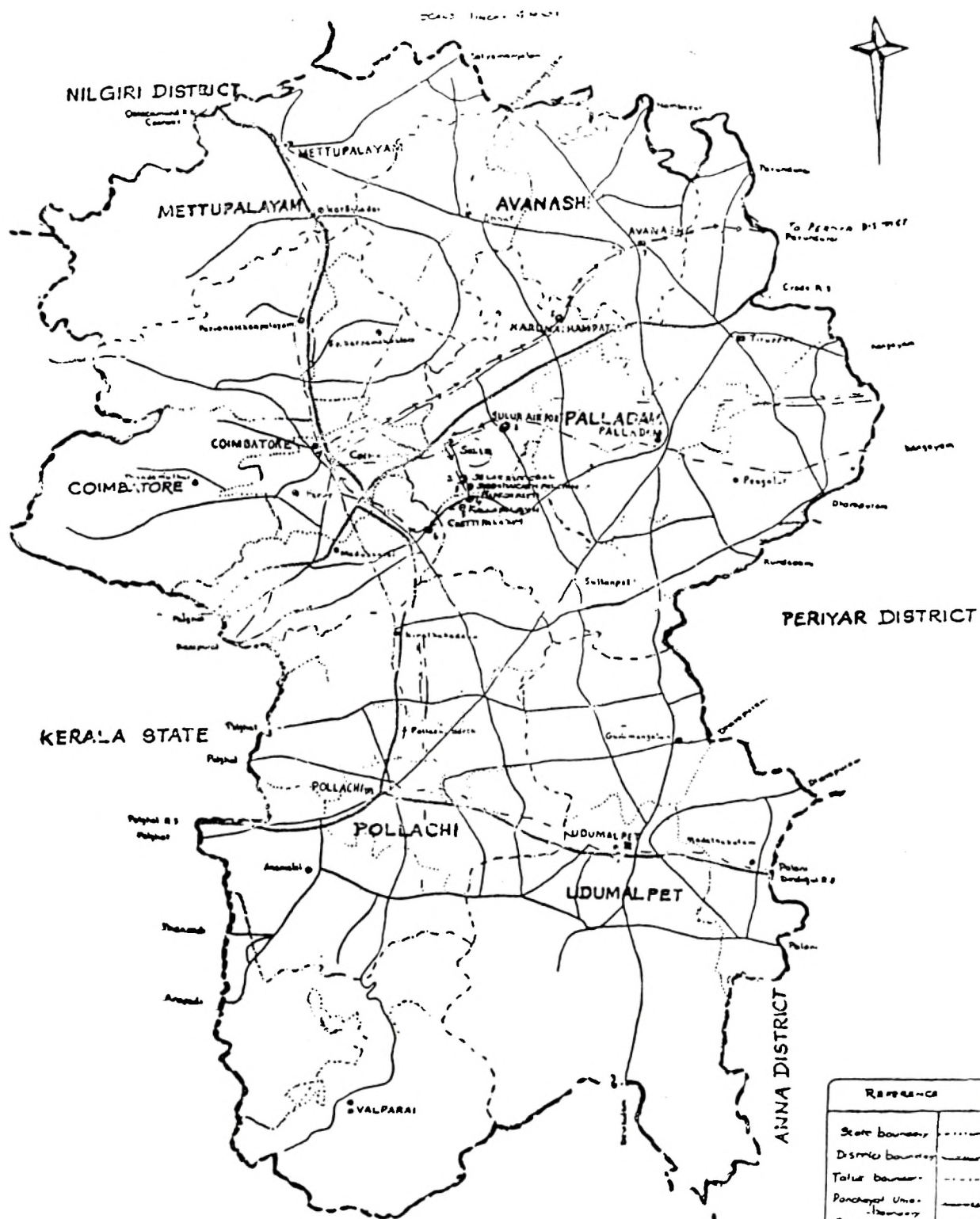


FIGURE 1

REFERENCE	
State boundary	-----
District boundary	-----
Taluk boundary	-----
Panchayat Union boundary	-----
State High ways	-----
Major District Road	-----
Railway line	-----
Not shown high ways	-----

Coimbatore District, 2002-2003). The district has made rapid strides in agriculture and allied activities, industry, trade and transport.

Coimbatore district had the highest proportion of in-migrants viz., 30 percent, next to the districts of Nilgiris (35.8 percent), Periyar (34.2 percent), Chengalpattu M.G.R. (31.5 percent) and Thanjavur (30.7 percent). A total of 4,64,259 persons were recorded as in-migrants in the district comprising 2,25,225 males and 2,39,004 females. Though these in-migrants were drawn from several districts of Tamil Nadu, southern districts dominated with 72 percent.

The construction industry is a very busy industry in itself. Due to the growing affluence caused by industrial and commercial activities going on in the district, construction activities take place intensively throughout the year. Supporting industries for construction namely, brick manufacturing units, units making flooring tiles, wood work units and units trading in sanitary wares and bath room fittings have also grown considerably in Coimbatore. Among these supporting units, the chamber brick manufacturing units occupy a key position. There are certain reasons why the people engaged in construction and owners of buildings prefer to use chamber bricks in construction as against the bricks turned out by traditional units or methods. The chamber bricks are good in quality, strength and they involve less wastage of cement mortar in the process of construction. Therefore Chamber bricks are more in demand as inputs in

construction industry. The chamber bricks industry is well established and developing, giving rise to consistent employment to workers in this industry. The industry employs a large amount of migrant labour, in addition to local labour (Interview with members of brick owners associations).

The brick manufacturing units are heavily concentrated in the villages of Chinnathadagam, Nanjundapuram, Pannimadai, Somayampalayam, Thudialur, Veerapandi and Anaikatti in the Perianaickenpalayam block in Coimbatore district (vide Fig. 2). It has a heavy concentration of brick manufacturing units, which use modern technology to turn out chamber bricks. The most important factor behind the concentration of brick-making units in these villages is the quality of soil available, which is a mixture of 60 percent clay and 40 percent sand. It is the best quality soil available in the entire state of Tamil Nadu (oral interviews with the owners of brick manufacturing units).

In this area, there are about 500 brick kiln units of varying size producing about one lakh bricks from 300 tonnes of soil and about one lakh litres of water every day (The Hindu, 2002). A total of 10,000 workers are employed in these units. Seventy percent of them are migrants from

Foot Note : A block is an administrative division comprising around 100 villages with a population of about 50,000 and more. The administrative responsibilities devolve on the panchayat union and its elected members and the developmental activities devolve on the block development officer.

MAP OF PERIANAICKENPALAYAM BLOCK

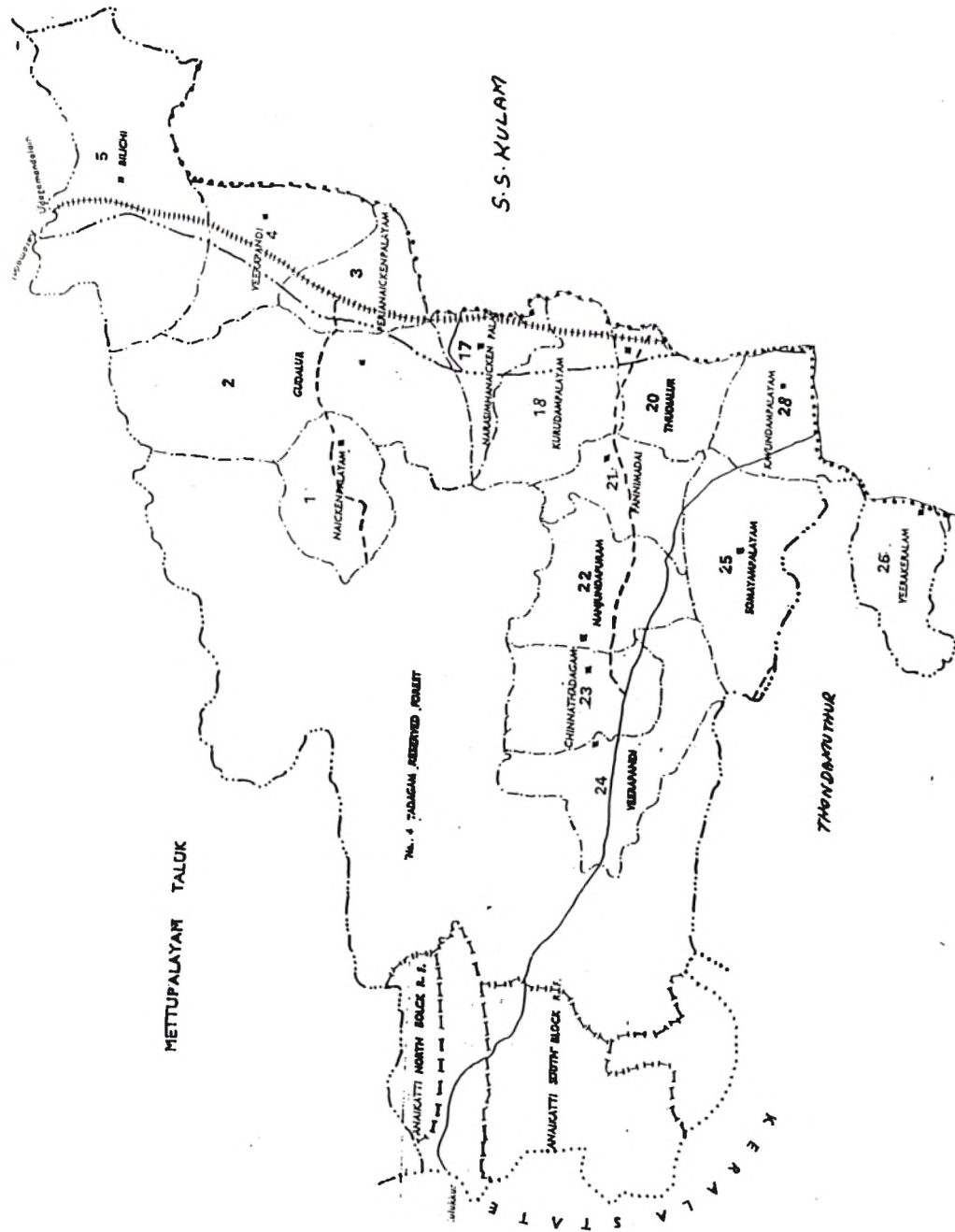


FIGURE 2

southern districts of Tamil Nadu viz., Madurai, Theni, Kanniyakumari, Tirunelveli, Salem, Trichy, Thanjavur, Tirunelveli and Dharmapuri. Construction industry is rather restrained during the rainy season (September – December) and it picks up from January onwards. The reference period of the current study was April to August 2001 coinciding with the busy season in construction activity.

B. Sampling Procedure and Data Collection

The study was based on data collected from both secondary and primary sources. Data relating to district profile and block profile were obtained from published sources like Census Reports and District Census Handbooks. To obtain the sample of workers for the study, a list of all the brick units functioning in the study area was made in consultation with the members of brick owners association and village leaders. It constituted the sampling frame ; cluster sampling method was used to draw the sample workers.

As a first step, systematic random sampling was used to select 50 units out of the total of 500 units in the area selecting every tenth unit in the list. All the workers in these units were personally interviewed for the study. The total sample for the study was 1050 workers working in the sample manufacturing units. Post stratification showed that two-thirds of them (700) were migrant workers and one-third (350) were local workers.

To test and finalise the interview schedule, a pilot survey was conducted during March 2001. Based on the experience in the pilot study, the schedule was recast and it was canvassed among the sample during the period April – August 2001. The schedule covered questions on their such as social, economic and demographic background, reasons for migration, pre-migration and after migration working conditions, income differentials, details on remittances and health status, (vide Appendix I). During the initial visits to the study area, information on the villages, number of brick manufacturing units, type of organisation, operations, method of hiring workers, production details, wages etc., were collected from village leaders and school headmasters located in the study area (Vide Appendix II). The researcher created good rapport with local leaders and owners of brick kiln units of each village and explained to them the nature and purpose of the study and they were co-operative in arranging for researcher's interview with workers when they were working in full swing and also during their off-time. The mean time taken to complete an interview was about 40-50 minutes.

C. Theoretical Model

The study involved estimation of the determinants of the migration decision, the labour supply and wages of migrant workers as against the non-migrant workers and their remittance behaviour. The act of migration is conceived as an attempt to ease the budget constraint in the utility

maximisation model through increase in wage rates and thereby the expected income. The process of migration which is a response to expected income differentials (Todaro, 1969 and Harris and Todaro, 1973) fits within this utility maximisation frame work. A survey of the household models showed that the neo-classical utility maximisation model would be appropriate in explaining this behaviour. The labour supply function is derived from a general model of consumer behaviour where the individual household maximises a well-behaved utility function subject to a budget constraint (Mohan, 1985 ; Pencavel, 1986 and Malathi, 1991).

Adapting from Mohan (1985), the utility maximisation model with respect to labour supply decision is outlined as under :

An individual is assumed to decide on his work-leisure choice such that the utility of the whole household is optimised. If there are n individuals in the household, the utility function U becomes

$$U = (\ell_1, \ell_2, \dots, \ell_n ; x, z) \quad (1)$$

where

$\ell_1, \ell_2, \dots, \ell_n$ is the time devoted to leisure by each family member i ,

X is the Hicksian composite good consumed by the household

Z is a vector of other characteristics of the household.

The household maximizes U subject to the budget constraint :

$$px = \sum_{i=1}^n h_i w_i + A \quad (2)$$

and

$$0 \leq \ell_i \leq T_i \quad (3)$$

where

h_i is hours worked in the market by individual i , for hourly market wage w_i

p is the price level

A is the non-labour income of the household

Equation (3) states that leisure time is non-negative and is, moreover, bounded by the total time available T . It can be rewritten as

$$\ell_i + h_i = T \quad (4)$$

Thus the household maximizes U subject to (2), (3) and (4).

Assuming that U is a twice differentiable quasi concave function and has positive first partial derivatives for all its arguments, the Lagrangian was written as

$$L = U(\ell_1, \ell_2, \dots, \ell_n; x; z) + \lambda \left(\sum_{i=1}^n h_i w_i + A - px \right) + \sum_{i=1}^n \gamma_i (T - \ell_i - h_i) \quad (5)$$

The Kuhn Tucker conditions are :

$$\frac{\partial L}{\partial X} = U_x - \lambda_p = 0 \quad (6)$$

$$\frac{\partial L}{\partial \ell_i} = U_{\ell_i} - \gamma_i \leq 0 \quad (7)$$

$$\ell_i \frac{\partial L}{\partial \ell_i} = \ell_i (U_{\ell_i} - \gamma_i) = 0 \quad (8)$$

$$(\ell_i \geq 0) \quad (9)$$

$$\frac{\partial L}{\partial \lambda} = 0 \quad (10)$$

$$\frac{\partial L}{\partial \gamma} = 0 \quad (11)$$

$$\frac{\partial L}{\partial h_i} = -\gamma_i + \lambda w_i \leq 0 \quad (12)$$

$$h_i \frac{\partial L}{\partial h_i} = (-\gamma_i + \lambda w_i) h_i \leq 0 \quad (13)$$

$$(h_i \geq 0)$$

There are five unknowns (γ , Y_i , h_i , ℓ_i , x) and five equations and given the conditions on U_i , the system of equations is solved for those unknown in terms of p , w_i , A and z . From equation (6),

$$\lambda = \frac{U_x}{p}$$

and when $\ell_i > 0$, from (7) and (8)

$$\frac{\partial L}{\partial \ell_i} = U_{\ell_i} - \gamma_i = 0$$

or $\gamma_i = U_{\ell_i}$ i.e. the marginal utility from leisure. When $h_i > 0$, from equation (12) and (13)

$$\gamma_i = \lambda w_i$$

$$\text{or } U_{\ell_i} = \lambda w_i$$

$$\text{or } U_{\ell_i} = \frac{U_x}{p} \cdot w_i$$

$$\text{i.e. } w_i = \frac{U_{\ell_i}}{(U_x / p)} = \frac{M U_{\ell_i}}{M U_x} \text{ when } h_i > 0 \quad (14)$$

Equation (14) shows that when $h_i > 0$ i.e., when a person works, the market wage is equal to the marginal rate of substitution between leisure and other goods, in other words, the shadow price of the individual's time.

However, if $h_i = 0$, from equations (12) and (13)

$$\gamma_i - \lambda w_i > 0$$

$$\frac{U_{\ell_i}}{U_x / p} - w_i > 0$$

We can write the first term as w_i^* the shadow price of the individual's time, then

$$w_i^* - w_i > 0 \quad \text{if } h = 0 \quad (15)$$

$$\text{where} \quad w_i^* = \frac{U_{\ell_i}}{(U_x / p)} \quad (16)$$

Equations (14), (15) and (16) determine the labour supply schedule and, also suggest the estimation procedure.

Equation (16) holds for both $h = 0$ and $h > 0$ and can be written as

$$\begin{aligned} w_i^* &= f(\ell_i, x; z; p) \\ &= f(h_i, \sum w_i h_i + A; p; z) \end{aligned} \quad (17)$$

This is the result of the household's optimisation process. If f exists and is continuous, the labour supply function for h_i also exists in terms of w_i^* and the other variables.

The demand side function for the market wage rate w_i is expressed in terms of education (S), experience (E) and other background variables (X).

$$\text{i.e., } w_i = g(S, E; X) \quad (18)$$

but w_i is only observed if $h_i > 0$.

For estimation purpose, equations (17) and (18) are rewritten as linear functions along with a stochastic disturbance term.

$$w_i^* = \mathcal{L}_0 + \mathcal{L}_1 h_i + \mathcal{L}_2 Y_i + \mathcal{L}_3 A_i + \mathcal{L}_4 Z_i + u_i \quad (19)$$

$$w_i = \beta_0 + \beta_1 S_i + \beta_2 E_i + \beta_3 X_i + e_i \quad (20)$$

Remittances impact on the intra-household allocation of resources between two or more geographically separated components of an economic household. Hence the issue of remittance behaviour can be brought within the context of household utility maximisation model, maintain Knowles and Anker (1977). According to them the level of transfers is determined by the utility maximisation behaviour of the sending household.

$$U = U(Y_i, Y_j, Y_k) \quad (21)$$

Where U is the utility of a given household, Y is the post-transfer level of income (i.e., personal income) and where the subscript 'i' refers to that part of economic household which resides with the head of the household,

'j' refers to that part of the economic household which resides elsewhere, and 'k' refers to those people outside the economic household whose welfare seriously concerns the head of the household.

D. Econometric Estimation and Issues

Since the study involved variables like why people migrated and why they transferred their incomes to the families and what made them determine the amount of labour supply to the market, many of which were in the nature of limited dependent, censored and truncated variables the classical OLS estimation procedure could not be straightaway applied in modelling such behaviour. The problem of self selection was also involved in the process of sampling. To overcome both these problems, the investigator had used maximum likelihood estimation procedure of Logit, and Tobit models and provided for selectivity bias explicitly through a selectivity bias variable.

The OLS estimation procedure could not be applied in the current context. In regressions involving binary dependent variables, the problem of heteroscedasticity arises making the OLS estimation of the standard errors biased. In addition, the disturbance terms are bounded and hence at best only approximately normally distributed (Knowles and Anker, 1977).

The linear probability model had the basic equation as follows :

$$P_i = E(Y = \frac{1}{X_i}) = \beta_0 + \beta_j X_i \quad (22)$$

where

i stands for the individual, Y the dummy dependent variable in the equation one, if the worker were a migrant otherwise 0 ; one if the migrant makes remittance, otherwise zero.

X_j is a set of regression or explanatory variables

β_0 and β_j are the co-efficients

This equation was estimated by OLS procedure.

In view of the limitations inherent in LPM, (Gujarati, 1995), viz. non-normality of the error term, heteroscedasticity, the possibility of the estimated probability to lie beyond 0 and 1 bounds and its assumption that conditional probabilities increase linearly with values of the explanatory variables, the alternative Logit model was tried. Though the Logit and the Probit models are comparable, the Logit model was preferred to the Probit because, Logit cumulative distribution is relatively flatter and approaches the limits slowly as compared to the standard normal distribution underlying the Probit model.

The underlying equation of the Logit model was :

$$P_i = E(Y = 1 / X_i) = \frac{1}{1 + e^{-(\beta_1 + \beta_j X_i)}} \quad (23)$$

which had the cumulative logistic distribution function as

$$P_i = \frac{1}{1 + e^{-Z_i}} \quad (24)$$

where

$$Z_i = \beta_0 + \beta_j X_i$$

In its estimable form, the equation in terms of the log of the odds ratio became

$$L_{ij} = \ln \left(\frac{P_i}{1 - P_i} \right) = Z_i = \beta_0 + \beta_j X_i \quad (25)$$

Since the study was based on individual data sets obtained through survey, the maximum likelihood estimation procedure was used to fit the model (Gujarati, 1995).

The rate of change in the probability in the Logit model was given by

$$\frac{\partial P}{\partial X_i} = \beta_i P_i (1 - P_i) \quad (26)$$

where

β_j is the co-efficient of j th regressor

P_i was evaluated at the mean level.

The advantage in the Logit model was that it guaranteed the estimated probabilities in the 0 to 1 range and ensured that these probabilities were non-linearly related to the explanatory variables. That is the probability tended to taper off as the values of explanatory variables approached their limits.

1. Migration Decision Function

The survey of theories on migration (Lewis, 1954 ; Fei and Ranis, 1964 ; Lee, 1966 ; Ravenstein, 1985 and Borjas, 1989, 1994) and studies on migration (Davis, 1951 ; Zachariah, 1960 ; Kumble, 1973 and Murthy and Murthy, 1980) pointed to the selection of the following as the explanatory variables in the migration behaviour equation : income differentials, levels of education, better opportunities, urbanisation and better working conditions, etc.

The migration decision function tested in the current study was of the form :

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9) \quad (27)$$

where

- y - Dependent - dummy variable equals one, if the worker is a migrant and zero otherwise.
- X₁ - Sex - dummy one if male ; zero otherwise.
- X₂ - Marital status - dummy one if unmarried / separated or widowed ; zero otherwise.
- X₃ - Current age in years
- X₄ - Age squared
- X₅ - Education - dummy one if literate, (all levels of education) ; zero otherwise.
- X₆ - Land holding - dummy one if no landholdings ; zero otherwise.
- X₇ - House property dummy one if no house ; zero otherwise.
- X₈ - Natural log of wage differential (current wage – old wage)
- X₉ - Days of unemployment per month at the place of origin

The personal characteristics of the workers namely age, sex, marital status and education were expected to have a positive effect on their probability to migrate in search of work. The family characteristics namely landlessness, houselessness and also were expected to increase their probability of migration. The log of the wage differentials between the current wage rates and pre-migration wage rates was expected to have a positive effect on their probability of migration. The economic distress of the workers in the home area in terms of severity of unemployment was supposed to have a positive effect and push the workers more towards migration.

The linear probability model by OLS procedure and the Logit model through maximum likelihood estimation procedure were used to estimate this equation.

2. Wage and labour supply functions of migrant workers as against non-migrant workers

The two-stage least square frame work that was used to estimate the labour supply behaviour of the workers. It was adopted from the procedure discussed by (Killingsworth and Heakman, 1986). The procedure consisted of estimating a wage equation, incorporating a selection bias correction variable, derived from the migration decision function. The predicted wage computed from this equation was used in the estimation of labour supply functions using OLS method.

a. Wage Equation

$$W_i = a_0 + a_1 X_1 + a_2 X_2 + a_3 X_3 + a_4 X_4 + a_5 X_5 + a_6 X_6 + a_7 X_7 + e \quad (28)$$

where

- W_i - Stands for natural logarithm of daily wage rate
- a_0 - Constant
- X_1 - Age
- X_2 - $\text{Age}^2 / 10$
- X_3 - Education - dummy one for all levels of education ; zero otherwise
- X_4 - Experience (Age – Schooling years – 5)
- X_5 - $\text{Experience}^2 / 10$
- X_6 - Sex - dummy one for male ; zero otherwise.
- X_7 - Inverse of Mills' ratio
- a_1 to a_7 - Co-efficients
- e - Error term

b. Labour Supply Function

$$\begin{aligned} LS = & b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 + b_7 X_7 \\ & + b_8 X_8 + b_9 X_9 + b_{10} X_{10} + b_{11} X_{11} + b_{12} X_{12} + b_{13} X_{13} \\ & + b_{14} X_{14} + b_{15} X_{15} + e \end{aligned} \quad (29)$$

where

- LS - Number of annual days worked.
- b_0 - Constant
- X_1 - Predicted wage rate

- X_2 - Age
- X_3 - Marital status - dummy one if unmarried, separated or widowed ; zero otherwise.
- X_4 - Illness days reported per month
- X_5 - Body mass index
- X_6 - Number of children below five years
- X_7 - Number of children between 5 – 10 years
- X_8 - Number of children between 10 – 15 years
- X_9 - Number of children more than 15 years
- X_{10} - Number of dependents – dummy one if dependents present ; zero otherwise
- X_{11} - Total family earnings in rupees per month
- X_{12} - Spouse's occupation - dummy one if employed ; zero otherwise.
- X_{13} - Spouse's income in rupees per month
- X_{14} - Children income in rupees per month
- X_{15} - Return migration - dummy if the worker intends to go back ; zero otherwise.
- b_1 to b_{15} - Co-efficients
- e - Error term

The need to work as well as the probability of finding a job increase as a person gains in age. So the coefficient of age was expected to be positive. Labour supply is a positive function of the wage rate assuming that at the current level of wages prevailing in the brick industry, the substitution effect will outweigh the income effect. In the event of an increase in wage rate induce the worker will supply more of his labour

services. The personal and family characteristics, number of dependents left behind at the place of origin, children of different age groups, and marital status of the person were indicative of the economic need of the individual to be in the labour force. As such they are expected to have a positive association with the amount of labour supplied.

Factors that tend to increase the reservation wage and therefore reduce the amount of labour supplied are the earnings derived from spouse's employment, children's employment and size of family earnings. The larger these amounts are, the lower would be the participation of a person in the labour force.

The health status of the individual workers both in terms of ill days reported and body mass index, were expected be negatively associated with the quantity of labour supply.

The predicted wage rates derived from the wage equation (28) was entered in the place of observed wage rate in the labour supply equation (29), since the use of predicted wage rate helped in eliminating the sources of measurement error and purged the wage variable of transitory components (Malathy, 1991).

The wage equations and labour supply equations were estimated separately for the entire sample as well as for the subgroups of migrant male, migrant female and non-migrant male and non-migrant female workers, by using the OLS procedure.

3. Remittance Functions

Though the migrants have left behind their families for purposes of employment, the family continues to be a source of economic security, emotional satisfaction and tangible assets to them. For these and other reasons, the migrant commits himself to a flow of remittances. Yet, not all migrants are observed to maintain their links with the families through making periodical remittances. A few reported studies (Santhapparaj 1993 ; Changrang and Nangia, 1997 ; and Duraiswamy and Narasimhan, 1997) had shown the migrants making the remittance are in the range of 25 percent and 30 percent. They have also suggested that the two issues relating to remittances namely the factors influencing the decision of a migrant to remit and the factors influencing the amount remitted by the migrant, should be treated as two separate issues. Following them, in the current study, the remittance behaviour was split into these two dimensions. The first issue, namely decision to remit, was modelled on the pattern of the decision to migrate because the decision was also a binary dependent variable. The remittance decision equation was of the form

$$Y = a_0 + a_1 X_1 + a_2 X_2 + a_3 X_3 + a_4 X_4 + a_5 X_5 + a_6 X_6 + a_7 X_7 + a_8 X_8 + a_9 X_9 + a_{10} X_{10} + a_{11} X_{11} + a_{12} X_{12} + e \quad (30)$$

where

Y - is a dependent - dummy binary variable one if the migrant makes remittance ; zero otherwise.

a_0 - Constant

- X_1 - Income of the worker per month
- X_2 - Income²
- X_3 - Family members involved in migration - dummy one if migrated alone / with family members ; zero otherwise.
- X_4 - Marital status - dummy one if unmarried / separated / widowed ; zero otherwise.
- X_5 - Number of school going children at the place of origin.
- X_6 - Return migration - dummy one if intends to return ; zero otherwise
- X_7 - Possession of ancestral property - dummy one if no land and house possessed ; zero otherwise.
- X_8 - Period of migration in years
- X_9 - Current age
- X_{10} - Age²
- X_{11} - None of dependents - dummy one if dependents are present ; zero otherwise
- X_{12} - Number of school going children at destination
- a_1 to a_{12} - Co-efficients
- e - Error term

The LPM model by OLS procedure and the Tobit model through maximum likelihood estimation procedure were used to estimate this equation.

In the second stage, the selectivity bias variable derived from the decision to remit equation was used as an additional regressor in the equation describing the factors determining the amount remitted. The amount remitted equation was of the form

$$\begin{aligned}
 R = & (b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 + b_7 X_7 \\
 & + b_8 X_8 + b_9 X_9 + b_{10} X_{10} + b_{11} X_{11} + b_{12} X_{12} + b_{13} X_{13} + e)
 \end{aligned}
 \tag{31}$$

where

- R - Dependent variable - Natural logarithm of monthly remittance
- X_1 to X_{13} - Set of variables as used in decision to remit equation (30)
- X_{13} - Inverse of Mill's ratio
- e - error term.

The relationship between the income of the worker and the amount remitted by him to his family left behind at the origin is expected to be positive. If a family moves with associated members in the family (wife, elders and earning children) their family income will increase and is expected to have a positive relationship with amount remitted. Regarding marital status of a person, an unmarried, person is likely to remit more towards his parental family at the origin and married persons who due to their family commitments may decide to remit less. If a migrant decides to return to the home area, he may like to remit more in order to accumulate assets to earn an assured income in future. So the variable return migration is expected to turn out with a positive sign. The variable period of migration is expected to have a negative relationship with the amount remitted. The presence of school going children and dependents at the place of origin may require transfer of more money on the part of the

migrant workers, so the expected relationship will be positive. If more number of children and dependents present at the destination place, it will dampen the decision to remit and reduce the amount remitted.

All the equations were estimated using the LIMDEP econometric software (Version No. 7).

In addition to these estimations, means, ratios and percentages were used to summarise the data wherever necessary.

E. Terms and Concepts

Chamber Bricks Manufacturing Units

They are brick kiln units, manufacturing bricks using modern methods to firing bricks. They have immovable steam burner with a height of 60 feet around which dried moulded bricks are lined up for firing. On every line 3000 bricks are arranged and set fire at every two lines. Every day, 30,000 bricks could be taken out from chamber (Vide Plate I).

Migrant Labour

Migrant labour in the current study is defined as a worker who does not belong to the Coimbatore region but who has moved in to the particular villages in Coimbatore for purposes of taking up a job in brick manufacturing units in the last 15 years.

STRUCTURE OF BRICK CHAMBER UNIT



MOULDED BRICKS GETTING DRIED



PLATE - I

Body Mass Index (BMI)

It is a long term measure of health status of an individual and is expressed as a ratio between weight in kg and height in meters squared. The ratio ranges between 18.5 and 25 for healthy individuals ; if the individual has BMI below 18.5, it is an indicative of under nourishment and ill health and if it were above 25, it shows obesity (ICMR, 1999).

Remittance

The amount remitted is defined as the sum total of cash plus gifts transferred by the migrant worker to his family members in his native place during the past one year ending March 2001.

Expected level of remittance

It is defined as the product of the migrant's decision to remit and the actual amount remitted by them, following Knowles and Anker (1977). The elasticity of the expected level of remittances was given by

$$\eta = \frac{\frac{d \hat{R}}{d X_i} X_i}{\hat{r}} \quad (32)$$

where

$$\frac{d \hat{R}}{d X_i} = \frac{\partial P}{\partial X_i} r + \frac{\partial R}{\partial X_i} P$$

X_i - particular explanatory variable

r - sample mean level of remittances

$\hat{R}$ - expected level of remittances sent by all migrants (including those not remitting)

- P - sample proportion of workers making remittances
- $\hat{r}$ - sample mean level of remittances sent by those reporting transfers.

F. Limitations of the Study

- The study examined migration decisions, labour supply and remittance behaviour at one point of time. It has not attempted multi period analysis where the decision in one period depends on the values of explanatory variables in the subsequent periods.
- Unlike other studies, which investigated the households at the place of origin to study the issue of migration, the current study focused only on the workers who had migrated to the new place of employment, as against the natives who were employed in the same industry.
- The labour market transactions involve a number of issues namely wage rates, quantity of labour supplied, quantity of labour demanded and level of work effort called for, the range of activities which an employee may be expected to perform, nature of contract working conditions, perquisites etc. The current study is restricted to wage rates and the number of days of employment per annum which constitute only a subset of transactions in a labour market.
- The impact of migration on the family and the economy has not been studied explicitly.

The results of the study are presented and discussed in the next Chapter.

CHAPTER IV

RESULTS AND DISCUSSION

IV. RESULTS AND DISCUSSION

The results of the study on “**Labour Supply Functions and Remittance Behaviour among Migrant Workers in a Seasonal Industry – Chamber Bricks Manufacturing Units in Rural Coimbatore**” are presented and discussed in the following heads :

A. DESCRIPTIVE ANALYSIS

1. Socio-economic Background of the Respondents
2. Economic conditions of Migrant Workers Prior to Migration
3. Factors Motivating Migration
4. The Working Conditions and Earnings Differentials Between Migrant and Non-Migrant Labour
5. Characteristics of Migrant Workers Reporting Remittances

B. ECONOMETRIC ANALYSIS

1. Estimates of Migration Status Function
2. Estimates of Wages and Labour Supply Functions
3. Determinants of Remittance Behaviour

A. DESCRIPTIVE ANALYSIS

I. Socio-economic Background of the Respondents

Migration is a dynamic and complex social process. Being a multidimensional phenomenon, it acts as an agent of economic, demographic, political and on the whole a social transformation

(Datta, 1985). People move from one place to another where some kind of development has taken place. Development in terms of large scale public and private sector industries and services sector in an area attracts people towards it for employment opportunities or to conduct some business. Different groups of people with different characteristics move from one place to another. Those who move from urban to urban areas and rural to rural areas would more or less have similar characteristics as their counterparts at their destination. But people moving from rural to urban areas and from urban to rural areas would be entirely different from their counterparts at the places of destination (Sivakumar, 2001). Further, certain groups move into urban areas to do only particular jobs such as building construction and business. These people moving from one area to another entirely new area would have characteristics very different from the local population at the places of destination which is called 'selection process' in the literature on migration.

Earlier studies - Kitagawa (1953), Elizaga (1966), Friedlander and Roshir (1966), Payderfar (1974), Role and Kanikar (1974), Tuladhar and Stoeckel (1982), Narain and Gotpagor (1983) have compared the characteristics of migrants with those of non-migrants to identify whether the former differ from the latter.

The current study attempts to find out selectivity in rural to rural migration by making a comparison between migrant and non-migrant labour in brick manufacturing units at the place of destination.

The profile of sample workers is described in relation to their personal, family characteristics, their pre-migration status, factors motivating their migration, working conditions and earnings and their remittance behaviour.

Table I gives details on the socio-economic characteristics of the total sample of 1050 workers (700 migrants and 350 non-migrants) engaged in the brick industry who were covered in the study.

TABLE I
DISTRIBUTION OF MIGRANT AND NON-MIGRANT WORKERS BY
THEIR CHARACTERISTICS

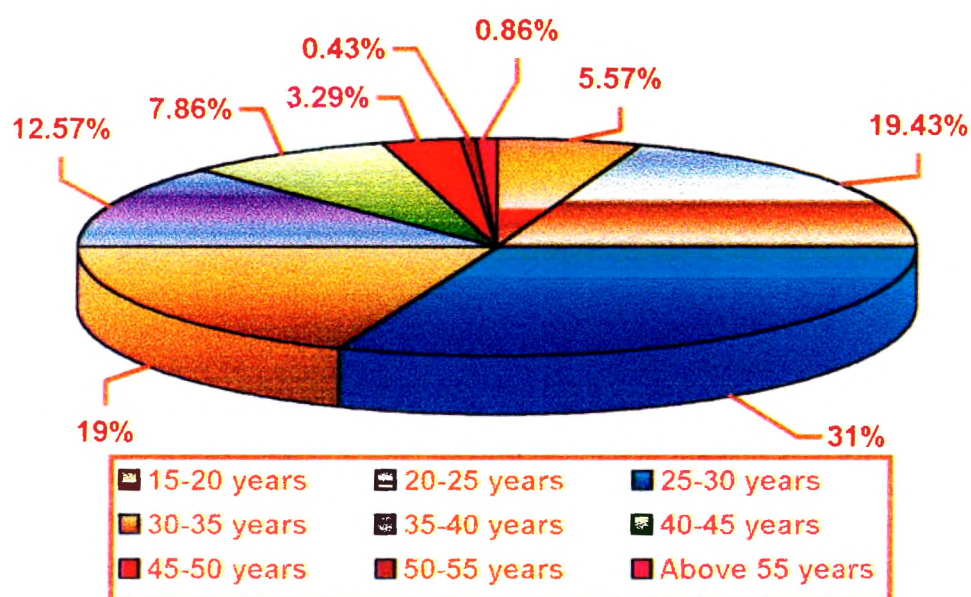
S.No.	Variable	Migrants		Non-migrants		Total	
		Number (700)	Per cent	Number (350)	Per cent	Number (1050)	Per cent
1.	Number of respondents						
	Male	381	54.43	165	47.14	546	52.00
	Female	319	45.57	185	52.86	504	48.00
2.	Age (in years)						
	15 – 20	39	5.57	21	6.00	60	5.71
	20 – 25	136	19.43	64	18.29	200	19.05
	25 – 30	217	31.00	75	21.43	292	27.81
	30 – 35	133	19.00	66	18.86	199	18.96
	35 – 40	88	12.57	53	15.14	141	13.43
	40 – 45	55	7.86	29	8.29	84	8.00
	45 – 50	23	3.29	29	8.29	52	4.95
	50 – 55	3	0.43	7	2.00	10	0.95
	Above 55	6	0.86	6	1.72	12	1.14
	Mean age (years)	22.4		24		23.2	
3.	Marital Status						
	Married	588	84.00	253	72.29	841	80.10
	Unmarried	94	13.43	82	23.43	176	16.76
	Separated / widowed	18	2.57	15	4.29	33	3.14
4.	Educational status						
	Uneducated	455	66.43	199	56.86	554	53.05
	Upto primary level	121	17.29	74	21.14	195	18.57
	Upto middle level	91	13.00	43	12.29	134	12.76
	Upto secondary level	19	2.71	32	9.14	51	4.86
	Higher secondary level	4	0.57	2	0.57	6	0.57
5.	Community Composition						
	Backward	316	45.14	37	10.57	353	33.62
	Most backward	216	30.86	209	59.71	425	40.48
	Schedule caste/scheduled tribes	163	23.29	96	27.43	259	24.66
	Other communities	5	0.71	8	2.29	13	1.24
6.	Family Size						
	Less than two	12	1.71	5	1.43	17	1.62
	2 – 3	72	10.29	49	14.00	121	11.52
	3 – 4	167	23.86	86	24.57	253	24.09
	4 – 5	280	40.00	140	40.00	420	40.00
	5 – 6	115	16.43	65	18.57	180	17.14
	6 – 7	37	5.29	5	1.43	42	4.00
	7 and above	17	2.43	0	0	17	1.62
	Mean family size	5.7	-	4.2	-	5	
7.	Parental occupation						
	Own agricultural farming	131	18.71	2	0.57	133	12.67
	Agricultural labour	365	52.14	181	51.71	546	52.00
	Casual labour	203	29.00	167	47.71	370	35.23
	Not employed	1	0.14	0	0	1	0.09
8.	Type of family						
	Nuclear	578	82.57	248	70.85	826	78.67
	Joint	122	17.43	102	29.15	224	21.33

Of the total 1050 workers, 52 percent were males and 48 percent were females. Male workers accounted for 54.4 percent in the migrant group. On the non-migrant group, female workers dominated with 53 percent share.

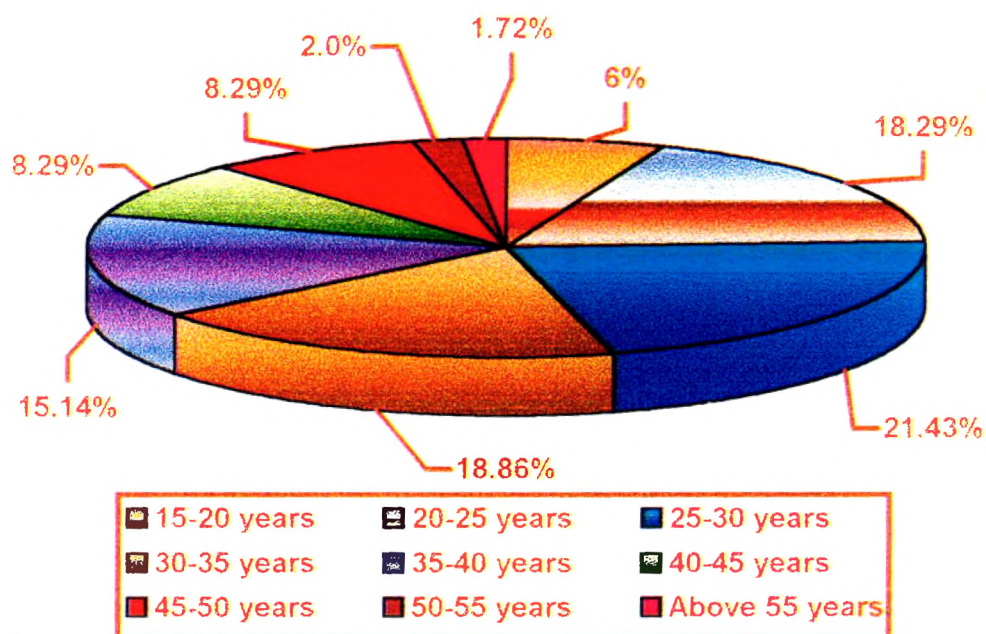
In spite of the fact that caste as a basis of occupational choice is slowly losing its ground (Bora, 1996), it still happens to be a main determinant of occupational choice. People of low castes take up jobs which are unrewarding normally. The community break-up of respondents shows that backward communities have a disproportionate share with 45 percent among migrants and 59.7 percent among non-migrant workers. Not a single respondent belongs to the higher strata of caste hierarchy. This again confirms that economic backwardness is closely associated with social deprivation and powerlessness in that only low-profile, less paying jobs involving manual work are available to those who are lower down in the caste ladder.

Age structure assumes importance in a study of workers sine it has a bearing on their decision to work, their productivity and earnings. Being poor, people may have no choice but to work due to economic compulsion, in fact women start working at a very tender age to keep the family fire burning. The migrant workers were younger than the non-migrant workers as is evident from the age distribution (Vide Fig. 3). In all, 87.6 percent of the migrants and 77.7 percent of non-migrants were

AGE WISE DISTRIBUTION OF WORKERS



Migrants



Non-migrants

FIGURE 3

below the age of 40 years. Further mean age of migrant workers was 22.4 years and it was 24 for non-migrants. There were only six workers in the age group of above 55 years in both categories of the workers. All the workers, other than 13.4 percent of the migrants and 23.4 percent of the non-migrants were married.

Education is a crucial input for development as it enables a person to understand his surroundings and environment in particular and to acquire information for promotion of his or her interests. While more than one third of the migrant workers are illiterate, only a little more than half of the non-migrants fell in this category. The workers in brick manufacturing industry have had hardly any opportunities for education, formal or non-formal. They had to settle down for work in brick industry, which did not require any special skill or training that is to be acquired by education. Instead this industry keeps these workers bound to manual labour throughout.

Majority of the migrants (82.6 percent) and non-migrants (70.9 percent) were from nuclear families. These findings are in conformity with that of Santhapparaj (1997) who found that nuclear families predominated in his study of urban informal sector workers in Madurai city. The larger the size of the family, the greater the burden on the head of the family. The model household size of migrants and non-migrants is four to five persons per family. In fact, one child norm was not observed among

sample families. Most of the members were still in their child bearing age (21-35 years) such a situation is likely not only to increase the pressure on time and energies of the respondents but also put severe financial strain on them. Both non-migrant (28.7 percent) and migrant (40.6 percent) workers have a good number of dependents living in joint families. This may be due to an overwhelmingly rural background of the work force / under study.

Parental occupation of a one fifth of the migrant labour was cultivation of land as against less than one percent of non-migrant labour. The parents of large number of non-migrant labour were agricultural labourers and artisans as compared to migrant labour.

2. Economic Conditions of Migrant Workers Prior to Migration

In this section, an attempt has been made to highlight the factors which compelled the rural workers to move out of their home in search of better earnings and reasonably assured employment for a major part of the year elsewhere. Several unfavourable economic conditions were prevailing at the places of origin as observed from the discussions with the sample respondents. Among them, heavy population pressure, conditions of unemployment and under employment were the important ones. These factors certainly induced different levels of migration in population of diverse composition. So an attempt has been made to identify who the

migrants are and their economic background at the origin which ejects out a large part of the working population into the stream of migration.

Before migrating into the brick manufacturing units at the place of destination, 99.7 percent of the respondents were engaged in some economic activity and only two respondents reported that they were not working.

The details relating to pre-migration status of the respondents are given in Table II.

TABLE II
DISTRIBUTION OF MIGRANT RESPONDENTS BY THEIR
PRE-MIGRATION CHARACTERISTICS

S.No.	Variable	Number (700)	Percent
1.	Employed before migrating	698	99.71
2.	Not working	2	0.29
3.	Employment Status		
	a. Own farming	106	15.14
	b. As agricultural labour	384	54.86
	c. As industrial labour	4	0.57
	d. As casual labour	204	29.14
	e. Non-working	2	0.29
4.	Area owned (in acres)		
	a. 0.25 – 1.00	21	3.00
	b. 1.00 – 2.00	85	12.14
	c. 2.00 – 3.00	13	1.86
	d. No landed property	581	83.00
5.	Family annual Income (in Rupees)		
	a. Less than 5,000	242	34.57
	b. 5,000 – 10,000	351	50.14
	c. 10,000 – 15,000	13	1.86
	d. 15,000 – 20,000	25	3.57
	e. 20,000 – 25,000	17	2.43
	f. 25,000 – 30,000	39	5.57
	g. 30,000 – 35,000	5	0.71
	h. 35,000 – 40,000	8	1.14
6.	Assets owned before migration		
	a. House	283	40.43
	b. Cattle	2	0.29
	c. House and land	106	15.14
	d. No items	309	44.14

TABLE II (CONTD.)

S.No.	Variable	Number (700)	Percent
7.	Working hours per day		
	a. Upto 7 hours	333	47.57
	b. Upto 8 hours	258	36.86
	c. Upto 10 hours	1	0.14
	d. Not employed	2	0.29
	e. Own farming	106	15.14
8.	Days of Employment (Agricultural labour-384)		
	a. Upto 15	28	7.30
	b. 15 – 16	131	34.00
	c. 16 – 17	151	39.32
	d. 17 – 18	61	15.89
	e. 18 – 19	2	0.52
	f. Around 20	11	2.86
9.	Days of Employment (Non-agricultural labour-208)		
	a. Upto 15	17	8.17
	b. 15 – 16	53	25.48
	c. 16 – 17	69	33.17
	d. 17 – 18	54	25.96
	e. 18 – 19	2	0.95
	f. Around 20	13	6.25
10.	Wages Per day (in Rupees)		
	a. Less than 20	4	0.57
	b. 20 – 25	6	0.86
	c. 25 – 30	142	20.29
	d. 30 – 35	324	46.29
	e. 35 – 40	107	15.29
	f. 40 – 45	5	0.71
	g. 45 – 50	2	0.29
	h. Above 50	2	0.29
	i. Own farming	106	15.14
	j. Not employed	2	0.29

TABLE II (CONTD.)

S.No.	Variable	Number (700)	Percent
11.	Indebtedness		
	a. Always (upto Rs.20,000)	684	97.71
	b. Some times (upto Rs.10,000)	11	1.57
	c. Rarely (upto Rs.5,000)	4	0.57
	d. No debt	1	0.14
12.	Reasons for debt		
	a. Family expenses	574	82.00
	b. Marriage	12	1.71
	c. Religious and social ceremonies	11	1.57
	d. Crop expenses	102	14.57
	e. No debt	1	0.14
13.	Source of borrowing		
	a. Money lender	578	82.57
	b. Friends	32	4.57
	c. Relatives	89	12.71
	d. No debt	1	0.14
14.	Reasons for leaving the earlier job		
	a. Low wages	105	15.00
	b. Nature of work	45	6.43
	c. Distance from home	10	1.43
	d. Lack of irrigation	106	15.14
	e. Low wages and nature of work	236	33.71
	f. Conditions of work and distance from house	113	15.14
	g. All the above	83	11.86
	h. No reasons	2	0.29

As for occupational distribution of the respondents prior to their migration, only 15 percent of the migrants belonged to the land cultivating category. About 55 percent of the workers were mainly dependent on agricultural labour followed by less than one percent of the workers deriving their livelihood from various activities like pot making and as factory workers. Nearly one-third of the workers who reported to have worked as casual labour.

Assets of a household in the pre-migratory conditions, comprised of land, houses and livestock. In these assets, land and houses accounted for the major share being 40 percent and 15 percent respectively in the total value of assets per worker. The value of assets per worker at the place of origin was in the range of Rs.40,000 – Rs.50,000.

With regard to land holding status, 83 percent of the migrants belonged to the landless category. In respect of others, who reported land holdings, land owned by them did not in effect exceeded three acres per household. As expected, because of the small size of landholdings, lack of irrigation and negligible use of fertilisers and high yielding varieties of seeds, migrants obtained very little income from land which put them under a compulsion to seek better opportunities.

Nearly 50 percent of the workers who reported that they depended on agriculture, worked for a period of 15 to 18 days per month. In order to ascertain the extent of unemployment among the workers, detailed information was sought regarding the number of days worked during the

year before migration. Out of the total 700 migrant workers, atleast 70 percent of the workers seemed to have worked only for a period of 15 to 17 days per month as agricultural labourers. The non-agricultural workers also were observed to have remained unemployed for a part of a month throughout the year.

All the respondents, whether they depended on agricultural operations or non-agricultural operations for their earnings, they were in a position to earn only Rs.20 to 35 per day as their daily wages. As this low income could not help them to maintain a good living, to meet their daily requirements, they had to depend upon borrowings from outside. The borrowed amount was spent on meeting family expenses and in meeting crop cultivation expenses incurred on their small pieces of land holdings. In meeting their debt requirements, it was observed that village money lenders played a crucial role in providing financial assistance though at an exorbitant rate of interest.

Thus, almost all the workers as the migrant sample shows, had incomes below poverty line (Rs.13,680 per annum for rural areas – Ninth plan, 1997-2002). The prime motive behind their migration was the pressure on them to get out of their poverty conditions caused by the nature and conditions of their work, low wages, lack of irrigation facility and long distance to cover to reach the work spot as attested by the responses of the respondents at the time of survey.

3. Factors Motivating Migration

Migration of people from one place to another has been considered as an essential component of economic development, social and political organisation. It is considered to be a means of promoting resource allocation, in particular labour resources. Out-migration is believed to increase rural incomes, land and labour productivity and the standard of living through transfer of resources as maintained by the classical development models (Lewis, 1954 ; Ranis and Fei, 1961). It has been argued that the migration decision is the outcome of a two-stage process. In the first stage, the decision is taken with regard to the economic necessity to move. In the second stage, the individuals think and search for optimal allocative locations (Connell et al., 1976).

The current study showed that the major factor which motivated the labourers to migrate for employment in the brick manufacturing units in non-agricultural sector of Coimbatore has been the economic distress faced by them in their native place due to factors such as unemployment, under employment, relatively low wages and low returns from their meagre land holdings due to low agricultural productivity. The general observation by the investigator at the brick kiln units and chambers showed that the number of migrant labourers in Coimbatore rose up significantly around mid 1980s when construction industry in the district picked up due to commercialisation and urbanisation of the district.

Table III shows the distribution of migrants (700) by select characteristics at the time of migration.

TABLE III
DISTRIBUTION OF MIGRANTS BY THEIR SELECT CHARACTERISTICS AT
THE TIME OF MIGRATION

S.No.	Variable	Number (700)	Percent
1.	Period of migration		
	a. Less than one	20	2.86
	b. 1 – 5	284	40.57
	c. 5 – 10	297	42.43
	d. 10 – 15	90	12.87
	e. 15 – 20	8	1.14
	f. 20 and above	1	0.14
2.	Age at migration (in years)		
	a. Less than 15	1	0.14
	b. 15 – 20	160	22.86
	c. 20 – 25	269	38.43
	d. 25 – 30	150	21.43
	e. 30 – 35	75	10.71
	f. 35 – 40	34	4.86
	g. 40 – 45	8	1.14
	h. 45 – 50	0	0.00
	i. 50 and above	3	0.43
3.	Marital status at the time of migration		
	a. Unmarried	151	21.57
	b. Married	544	77.71
	c. Separated / widowed	5	0.71
4.	Mode of migration		
	a. Alone	143	20.43
	b. With spouse	332	47.43
	c. With family members	225	32.14
5.	Number of working members in the family		
	a. One	261	37.29
	b. Two	422	60.29
	c. Three	17	2.42
6.	Source of information		
	a. Parents	11	1.57
	b. Prior migrants	263	37.57
	c. Relatives / neighbours	214	30.57
	d. Friends	160	22.86
	e. Contractors and agents	48	6.86
	f. No information	4	0.57
7.	Waiting period to get employed		
	a. A few days	320	45.71
	b. Few months	14	2.00
	c. Few weeks	193	27.57
	d. Immediately	173	24.71

The field survey revealed that 83 percent of the workers had migrated during the last 10 years. This indicates that the brick manufacturing units has created a huge demand for migrant workers especially during the busy season and due to shortage of locally available labour, the excess demand for labour is being met by the migrants from rural areas of different southern districts of Tamil Nadu (Madurai, Theni, Dindigul, Ramanathapuram, Kanniyakumari, Tirunelveli, Pudukkottai, Dharmapuri, Salem, Periyar, Trichy and Thanjavur) (Vide Fig. 4). Subsequently, the brick industry has developed a structure and system of employing a little more than 50 percent of its total labour from the migrant labourers.

Of the total respondents, 93 percent of the respondents migrated from the places of origin at the young age (15-35 years). The data on marital status showed that more than two-thirds of the migrant workers were married at the time when they migrated. The workers preferred to have their family with them, as 80 percent of the respondents moved out of their places of origin with their spouses and family dependents. Eighty nine percent of the respondents reported that they had moved out from their villages for economic reasons. These results are similar to the findings of Bora (1996) who reported that in-migrants from hill area of Himachal Pradesh to Delhi were mostly in the range of 15-34 years and they had migrated out from their villages for economic reasons and the push factors influenced 57 percent of the worker's decision to migrate out.

**DISTRIBUTION OF MIGRANT WORKERS BY
THEIR DISTANCE OF ORIGIN**

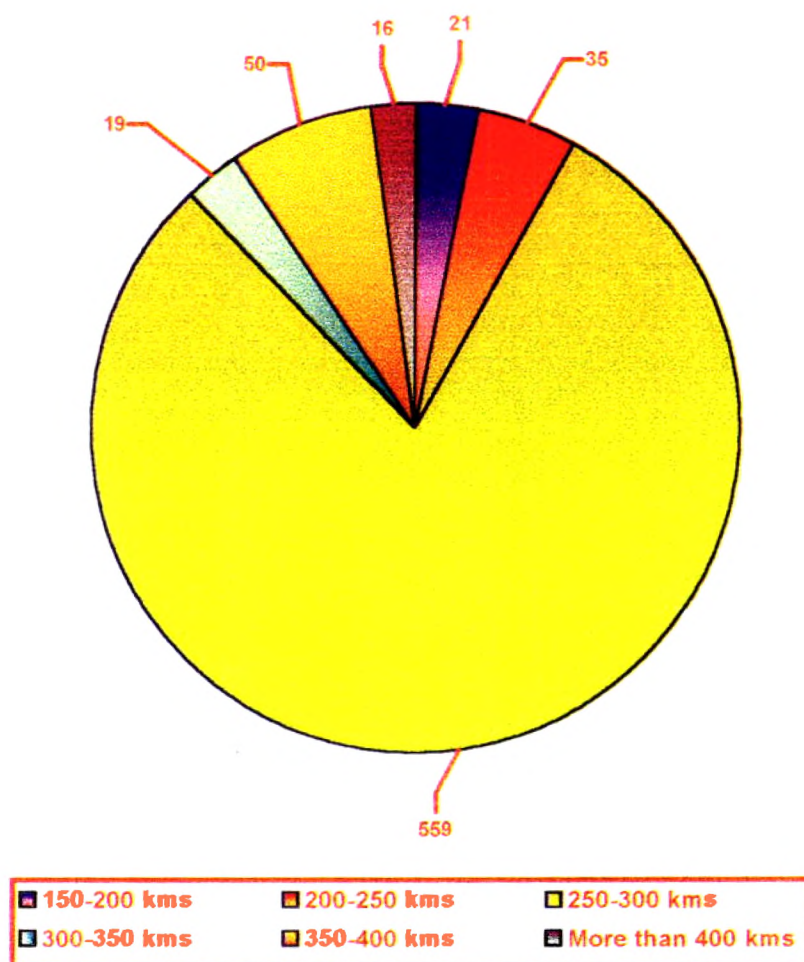


FIGURE 4

The survey of migrants in brick manufacturing units at Coimbatore further indicated that the period of waiting for their job ranged between a few days and a few months in the case of 75 percent of the migrants. On an average only 25 percent of the sample workers found a job easily and immediately. Oberai and Singh (1983) in their study on 'Causes and Consequences of Migration' in Ludhiana City of Punjab found that more than 90 percent of in-migrants who looked for work could find it within 60 days of their arrival at the place of work and Banerjee (1981) observed that the average period of waiting for their first job in Delhi was 17 days as revealed in his survey of migrants in Delhi city during 1975-76. These results indicated that rural migrant workers get absorbed rather quickly in the labour market at their place of destination.

Presence of relatives, prior migrants, friends and own villagers work as the major pull factors and source of information for potential migrants (Bora, 1996 and Singh and Aneyetei, 1996). Such contacts play a crucial role in influencing the migrants' decision. In the current study also, they were the major source of information for 68 percent of the migrants, followed by information supplied through by friends (23 percent).

The motives for migration are classified as 'push factors' which emphasise on the situation at the origin (that is place from which migration started) and pull factors which emphasise on the situation at the place of destination. The investigator identified 15 factors which could be treated as 'push factors' that made the respondents move away from their place ;

landlessness, small size of land holdings, size of family, illiteracy, family indebtedness, level of poverty, nature of jobs, low wages, etc. ; the factors which drew them into brick manufacturing units in the study area. These were easy availability of job, access to information sources, assured job, higher wages, better working conditions, better access to health facilities and better opportunities for children's education, etc.

Several studies have been carried out by economists to identify the push and pull factors of rural-urban migration. Dandekar and Rath (1971) identified poverty in the rural area as the main push factor, while the study by Sensarma (1997) negated this view and indicated rural literacy and unemployment in tertiary sector of urban areas as the main contributing factors to the phenomenon of rural-urban migration. Bosé (1978) found that the push back factor acts as a deterrent to the fresh flow of migration from rural to urban areas ; Singh and Aneyetei (1997) reported scarcity of good quality of land as a major push factor in rural-urban migration. Chakrapani and Mitra (1995) noticed a strong negative correlation between employment and rural-urban migration and a positive strong relation between employment in urban non-household manufacturing sector and rural-urban migration.

The responses given by the sample migrant workers towards the push and pull factors identified in the study are listed in Table IV and Figures 5 and 6).

TABLE IV
DISTRIBUTION OF RESPONDENTS BY THE IDENTIFIED
PUSH AND PULL FACTORS

S.No.	Factors	Number*	Percent
I.	Push factors		
1.	Level of poverty	484	69.14
2.	Unemployment	357	51.00
3.	Size of family	472	67.43
4.	Family indebtedness	480	68.57
5.	Low wages	375	53.57
6.	Economic necessity	359	51.29
7.	Lack of alternative employment in the off-season	299	42.71
8.	Age	1	0.14
9.	Small size of landholdings	280	40.00
10.	Landlessness	233	33.29
11.	Nature of jobs	370	52.86
12.	Illiteracy	118	16.86
13.	Underemployment	165	23.57
14.	Lack of opportunities for children's education	198	28.29
15.	Marriage	141	67.14
II.	Pull factors		
1.	Easy availability of job	642	91.71
2.	Access to information sources	338	48.29
3.	Assured job	538	76.86
4.	Higher wages	650	92.86
5.	Social infrastructural facilities	2	0.29
6.	Better working conditions	168	24.00
7.	Free residence	592	84.57
8.	Accident insurance facility	3	0.43
9.	Social security benefits	1	0.14
10.	Better opportunities for children's education	289	41.29
11.	Scholarships	40	5.71
12.	Better access to health facilities	436	62.29
13.	Alternative employment in the off-season and also in the event of closure	10	1.43
14.	Opportunities for social mingling	339	48.43
15.	Medical attention at the work spot	1	0.14

* Details relate to the multiple responses given by the respondents.

PUSH FACTORS IN MIGRATION

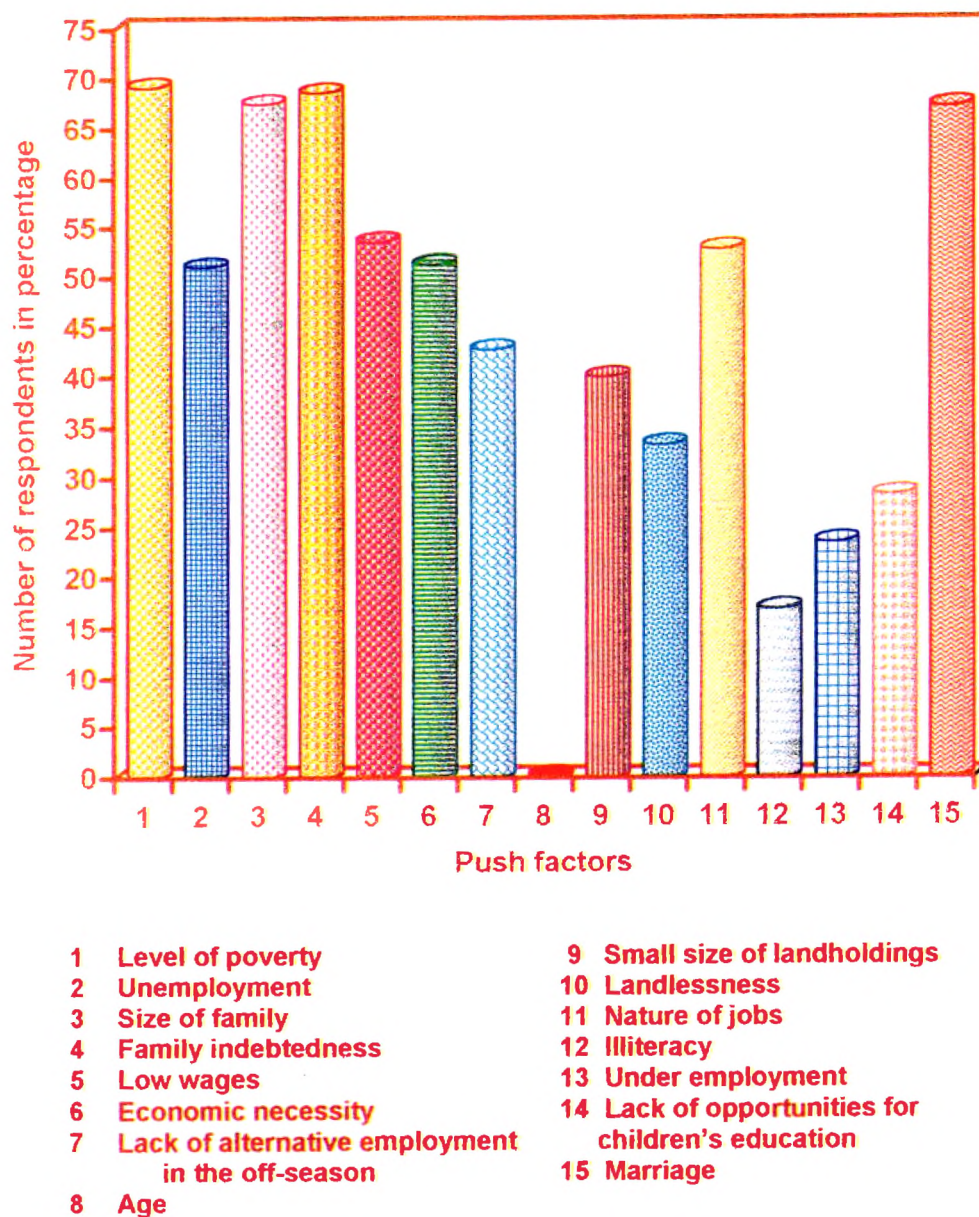
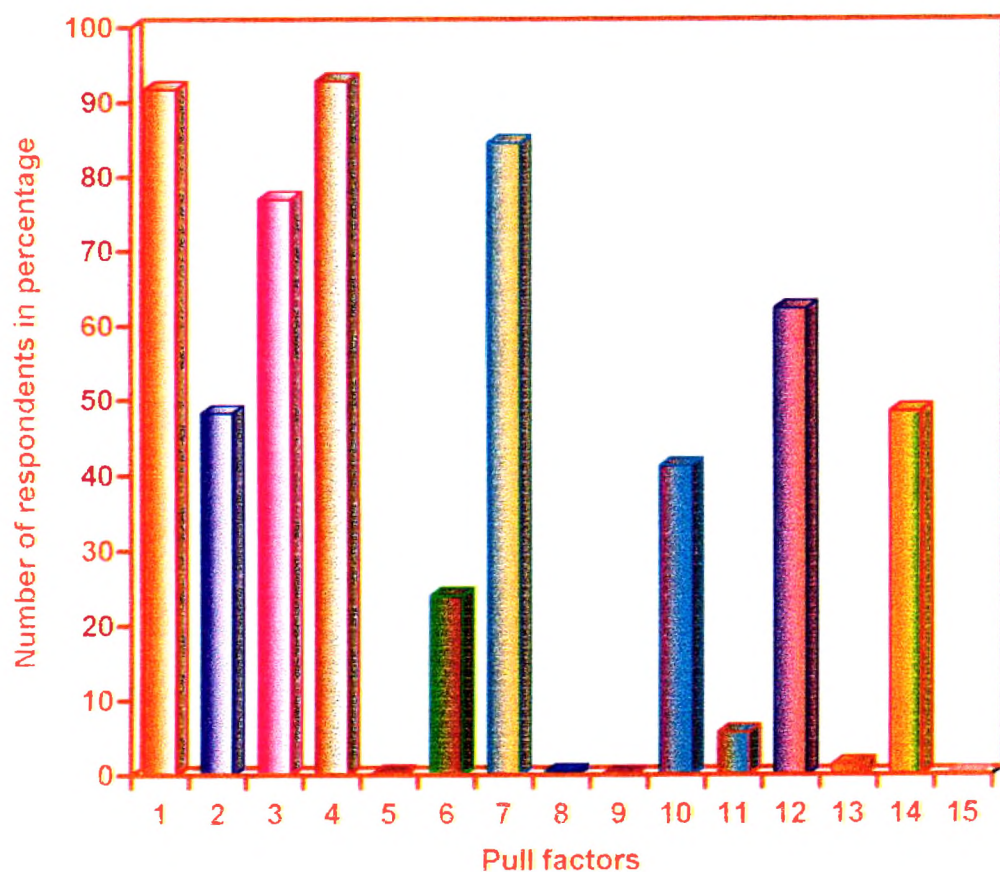


FIGURE 5

PULL FACTORS IN MIGRATION



- | | |
|-------------------------------------|--|
| 1 Easy availability of job | 10 Better opportunities for children's education |
| 2 Access to information sources | 11 Scholarships |
| 3 Assured job | 12 Better access to health facilities |
| 4 Higher wages | 13 Alternative employment in the off-season and also in the event of closure |
| 5 Social infrastructural facilities | 14 Opportunities for social mingling |
| 6 Better working conditions | 15 Medical attention at the workspot |
| 7 Free residence | |
| 8 Accident insurance facility | |
| 9 Social security benefits | |

FIGURE 6

It was observed that those who have given 'push factors' as the prime cause for moving to the study area are relatively younger than those who gave a pull factor as the prime cause. This could be interpreted in two ways : (1) the probability that a worker will migrate is likely to decrease as his age increases since older persons have a shorter expected working life over which to realise the advantage of migrating, which makes, the rate of return on migration lower for them. Individuals for whom migration is profitable immediately, move without delay, because postponing movement would result in a loss during early years. (2) Besides, the prospects on jobs, family ties are likely to be more important for older people than the younger ones.

As for the educational qualification, it is the illiterate and those who can read and write without any formal education, who have a higher probability of citing 'push factor' as the prime cause. This could be so, because those with relatively less educated qualifications may have a low level of skill, and hence have access only to low income activities.

4. The Working Conditions and Earnings Differentials Between Migrant and Non-Migrant Labour

Brick making activity, an ancillary activity for construction industry, is a perennial industry and a very crucial one, providing substantial employment opportunities to unskilled labourers. There is high demand for unskilled, semi-skilled and skilled workers in the brick making industry.

There exist a number of locations where the labourers gather in every village or town. The mode of operation in all these labour markets is very similar, where the construction labourers get together to find employment. There are no middlemen involved in this market and the transactions are made directly by the workers with the contractor. Sometimes these contractors happen to be owners of the chambers also.

The description of categories of workers in brick making units in the study area is presented in Table V.

TABLE V
DISTRIBUTION OF SAMPLE WORKERS BY NATURE OF EMPLOYMENT

Nature of employment	Migrant Labour		Non-migrant labour		All workers	
	Number (700)	Percent	Number (350)	Percent	Number (1050)	Percent
Temporary	234	33.43	123	35.15	357	34.08
Seasonal	376	53.71	143	40.85	519	49.43
Permanent	90	12.86	84	24.00	174	16.57

Not all brick kiln units employ all the workers on the same terms of work or wages. The workers in these units fall under these categories : temporary labour, seasonal and permanent labourers. Those who work as full time temporary labour may not have work throughout the year ; whether they work or not is a matter of their choice. Temporary full time workers are not found to work in the same brick kiln units all through the year and hence tend to move from one unit to another. The permanent workers are attached to only one brick unit and they are entitled to some service benefits like free gifts, free medical expenses at the time of emergency and they have to work on all working days. Seasonal labour, as the name itself suggests, is employed only during peak seasons when there is heavy demand for bricks. The seasonal workers form the largest category of workers (84 percent). The migrant labourers are relatively more in number in the category of seasonal labour (54 percent) as against 40 percent among non-migrants ; permanent labour (13 percent) was much less among migrants, as against 24 percent under non-migrant category. This distribution of workers by the nature of their employment shows that migrant workers are more vulnerable to problems of unemployment and low earnings as against the native labourers. The labour market outcomes are against the interests of migrant labour in these respects.

Several stages are involved in brick making. The first stage involves the preparation of clay out of various kinds of soil. Then, bricks are

moulded out of the clay, which are dried for a minimum of three days in the hot sun light and dry air. After that, the raw bricks are transferred into the kiln / chamber for heating. Fire wood, lignite and charcoal are used to set fire for bricks. After two or three days the finished bricks (processed) are taken out of the chamber / kiln, ready for sale. The price of bricks is decided by the market forces. Since the brick industry is seasonal in nature – during non-rainy seasons, the business is at its peak. The price of the brick is high during the rainy season. During the rainy season, the brick cutter and other brick workers engage themselves in agricultural work in their own native places (non-migrant workers) and the migrant workers are sent back to their native places.

On an average, the workers worked for eight to nine hours per day. Male workers were involved in mixing clay to mould bricks piling them on the burner for heating and in loading and unloading the bricks. Female workers were involved only in shifting the moulded bricks to sheds for drying and in shifting dried bricks to the burner (Vide Plate II). Since all these activities are hazardous in nature and they need to work continuously to earn a daily living, they are expected to maintain good health. Long term measure of health status, measured in terms of body mass index (BMI) was calculated for all the respondents covered under study and reported in Table VI.

MEN IN MIXING CLAY AND SAND FOR MOULDING BRICKS



WOMEN IN ARRANGING MOULDED BRICKS IN SHEDS

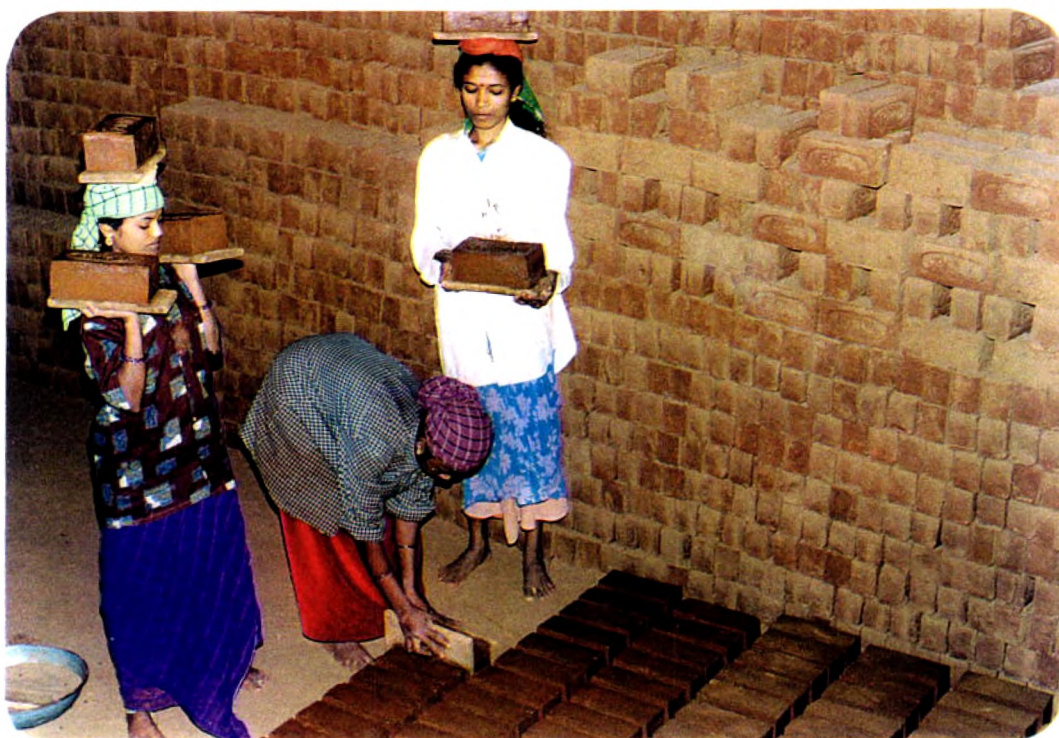


PLATE - II

TABLE VI
DISTRIBUTION OF MIGRANT AND NON-MIGRANT WORKERS BY
THEIR BODY MASS INDEX

S.No.	Body mass index	Migrant workers		Non-migrant workers	
		Number (700)	Percent	Number (350)	Percent
1.	Less than 15	10	1.43	4	1.14
2.	15 – 20	304	43.43	83	23.71
3.	20 – 25	301	43.00	205	58.57
4.	25 – 30	79	11.29	52	14.86
5.	30 – 35	4	0.57	6	1.71
6.	35 – 40	2	0.29	-	-

The body mass index in the range of 18.5 - 25 is accepted norm for normal health (ICMR, 1999). In the sample surveyed, 43 percent of the migrant workers and 59 percent of the non-migrants were found to maintain good health. As the brick industry involves a number of activities like moulding bricks, mixing clay and sand, firing bricks and loading and unloading, which are arduous in nature, the workers need to be healthy.

Earnings of a person is determined by the amount of direct investment in health, formal education, on-the-job training, study programmes like extension programmes in agriculture and migration (Schultz, 1961) ; investment on migration is a response to the differential economic opportunities between the two places – place of origin and place of destination (Treyz et al., 1993). However, unlike-investment on other human capital, investment on migration is highly risky and such investment is made by parents, who are prepared to take high risks and be more dynamic (Kannappan, 1985 and Galor and Stark, 1991).]

Migrant workers are discriminated against native workers by the employers on the basis of productive differentials or due to low elasticity of migrant labour supply or pure discrimination on the basis of taste and preferences (Galor and Stark, 1991 ; Collard, 1970 ; Chiswick, 1986 and Bloom and Gunderson, 1989). Prasad and Yogi (1991), Topal et al. (1999), Kishore (1998), Krishnaiah (1997) and Chand et al. (1998) in their studies suggest that migrants are likely to

participate in the labour force to a greater extent than natives. Several reasons are associated for such a situation, as migrants generally have a greater need for immediate income ; they are more likely to have lower income and job expectation and, therefore, prepared to take up low status jobs ; migrants may have higher participation rates than natives if they accept jobs which the natives do not and the migrants are an achievement oriented group and usually take greater risks in order to advance themselves. All these situations make migrants to have a higher participation rate.

The current study analysed and verified the above arguments in the context of performance of migrant and non-migrant workers involved in brick making chamber units. In particular, it highlighted the differences in the earnings of migrants and non-migrants. The earnings pattern of the migrants and non-migrants is presented in Table VII.

TABLE VII

DISTRIBUTION OF MIGRANT AND NON-MIGRANT WORKERS BY THEIR AVERAGE MONTHLY INCOME

(in rupees)

S.No.	Income Class	Migrant workers			Non-migrant workers			All workers		
		Number	As per cent of total migrants	Average income per worker	Number	As per cent of total non-migrants	Average income per worker	Number	As per cent of total migrants	Average income per worker
1.	500 – 1000	22	3.14	865.91	38	10.86	824.21	60	5.71	845.06
2.	1000 – 1500	301	43.00	1185.58	127	36.29	1296.54	428	40.76	1241.06
3.	1500 – 2000	145	20.71	1703.69	83	23.71	1688.55	228	21.71	1696.12
4.	2000 – 2500	165	23.57	2209.15	64	18.59	2215.63	229	21.81	2212.39
5.	2500 – 3000	61	8.71	2673.12	35	10	2678.86	96	9.14	2675.99
6.	3000 – 3500	5	0.71	3040.00	3	0.86	3133.33	8	0.76	3086.67
7.	3500 – 4500	1	0.14	3500.00	-	-	-	1	0.09	3500.00
	Total respondents	700	100		350	100		1050	100	
	Mean income of sample			1670.31			1660.26			1665.29

The average monthly income of the migrant worker at the time of survey was Rs.1670 and that of non-migrant worker was Rs.1660 per month. Though there was not much of a difference in the average income earned per worker by both migrant and non-migrant workers, the migrant workers are in a better position in terms of modal earning class compared to non-migrant workers. The unfavourable position of earnings of the non-migrant workers is because, the majority of the non-migrant workers do not possess the skill required to work in chamber and they are involved in manual operations of mixing clay and cutting bricks only.

Around six percent of migrants and eleven percent of the non-migrant workers were seen earning less than Rs.1000 per month. Among the migrants, nine percent were earnings more than Rs.2500 per month, while among non-migrants 11 percent came in this category. By and large migrant workers are better than the non-migrant workers, as far as earnings were concerned. In contrast to these findings, Santhapparaj (1997) concluded in his study that native workers were in a better position in terms of modal earning class as well as in average earnings per month.

This differential earnings shows that migrant workers bring with them skills and attitudes to the work place that raise their productivity relative to those of the non-migrants. The differential in earnings may

reflect the differentials in productivity between these two groups of workers.

A typical worker's family earned an amount of Rs.3000 to Rs.4000 per month. The distribution of migrants and non-migrant respondents by their household monthly income is shown in Table VIII.

TABLE VIII

DISTRIBUTION OF MIGRANT AND NON-MIGRANT RESPONDENTS BY THEIR HOUSEHOLD MEAN MONTHLY INCOME
(in rupees)

S.No.	Income Class	Migrant workers			Non-migrant workers			All workers		
		Number	As per cent of total migrants	Average income per worker	Number	As per cent of total non-migrants	Average income per worker	Number	As per cent of total migrants	Average income per worker
1.	Less than 1000	5	0.71	810	40	11.43	143.75	111	0.71	810.00
2.	1000 – 2000	71	10.14	1356.34	97	27.72	2433.92	283	10.57	750.05
3.	2000 – 3000	186	26.57	2496.34	200	57.14	3341.60	597	26.95	2465.13
4.	3000 – 4000	397	56.72	3300.61	13	3.71	4084.62	48	56.85	3321.10
5.	4000 – 5000	35	5.00	4181.43	-	-	-	4	4.57	4133.03
6.	5000 – 6000	4	0.57	5325.00	-	-	-	1	0.38	5325.00
7.	6000 – 7000	1	0.14	6500.00	-	-	-	1	0.09	6500.00
8.	Above 7000	1	0.14	7000.00	350	100	-	1050	0.09	7000.00
9.	Total	700	100	-	-	-	5	-	100.00	-
	Mean			3348.53			2500.97			2924.75

A majority of the migrant and non-migrant households income had their family below Rs.4000 per month. While none of the household could earn above Rs.4000 among non-migrant workers and around six percent of the workers among migrant group reported such incomes. The mean monthly income of migrant household was about Rs.3348 and that of non-migrant household was Rs.2500.

5. Characteristics of Migrant Workers Reporting Remittances

Remittances refer to the money transferred by the migrants to their village homes while they are away. If the migrants education, transport, foregone labour, emotion and other disruptions incurred by the family members at the origin are viewed as a form of investment by the members of the household remaining behind, then remittance can be seen as a return for the investment (Sjaastad, 1962). Remittances associated with migration are considered to be a key benefit for the area of origin not only by replacing foregone incomes but also by augmenting savings, investment and technological innovations (Choudhuri, 1993).

The importance of remittances in the development process is due to a number of factors (1) the scale and pace of rural to rural to urban migration (2) the magnitude of urban to rural remittances is usually transferred over quite a considerable period of time and it amounts to 10 percent to 30 percent of migrants' income (3) the wide-spread interest in transfers of income and mechanisms that generate changes in the

distribution of income (4) the impact of remittances on the resource constraints in the economy at large (5) the role of children as migrants enhancing returns to the parents for bearing and rearing of children (Stark, 1981).

Employment being the mainstay of the migrants and their respective families, the migrants were expected to remit a sizeable portion of their income to their native place. In the current study, about 33 percent of the respondents were found remitting money to their families in the native place (Vide Fig. 7).

Table IX shows the social background of the migrant workers making income transfers.

PROPORTION OF REMITTERS AMONG MIGRANT WORKERS

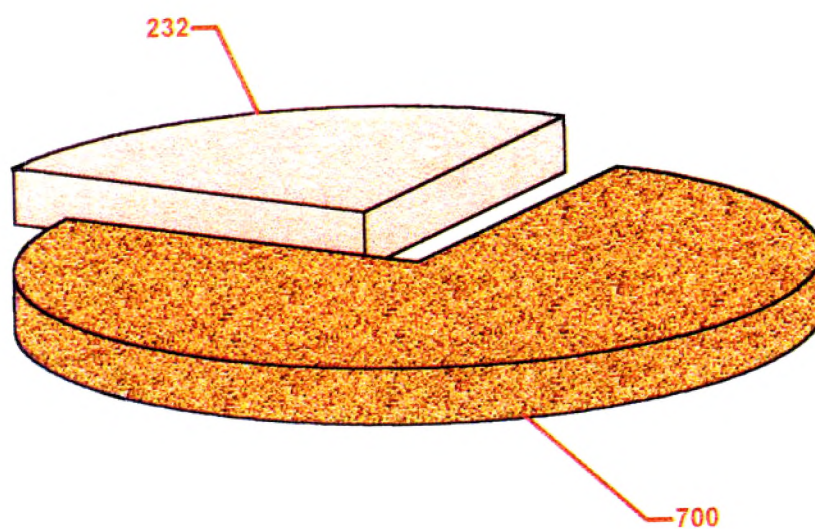


FIGURE 7

TABLE IX

DISTRIBUTION OF REMITTERS BY THEIR SELECT CHARACTERISTICS

Variable	Number (232)	Percentage
1. Age (in years)		
15-20	6	2.59
20-25	43	18.53
25-30	80	34.48
30-35	39	16.80
35-40	31	13.36
40-45	19	8.19
45-50	11	4.74
50-55	2	0.86
55 and above	1	0.43
2. Educational Status		
Illiterates	168	72.41
Up to primary level	40	17.24
Middle level	14	6.03
Secondary level	8	3.45
Higher Secondary level	2	0.86
3. Religion		
Backward	14	6.03
Most Backward	102	43.96
SC / ST	71	30.60
Others	45	19.40
4. Marital Status		
Married	203	87.50
Unmarried	29	12.50
Separated / widowed	0	0.0
5. Family size		
Two members	8	3.45
Three members	38	16.38
Four members	86	37.07
Five members	61	26.29
Six members	39	16.81

Of the 700 migrants, 232 migrants (33 percent) were making income transfers to their places of origin. Of the total remitters, 44 percent belonged to the most backward community that had left its dependents and other family members at the native places which required a heavy amount of income for their family expenses. Eighty percent of the remitters had a family size of four to six members consisting of either old dependents and school going children at the places of origin.

The most common way in which migrants kept contact with their native places was by way of visits to their places and by sending money to their native villages. Of the total 700 respondents, 26 percent had reported that they visited their places of origin once in six months and 48 percent stated that they visited the home town once in three months, as they had to cover a long distance and incur heavy expenses towards travelling. The remaining 26 percent expressed that they made their visits as and when necessity arose. It has been observed from the existing studies (Kishore, 1998 and Santhapparaj, 1998) that almost all the respondents covered in their studies have been making regular visits to their places of origin.

Remittances from out-migrants are likely to raise rural incomes and consumption. The net effect of remittances on the rural economy is difficult to determine. The amount may be used to create productive investment for the development and diversification of agriculture or of non-agricultural

activities in the rural areas or be spent on housing and education of the children who were left behind or be used to relieve the poverty of those who remained behind. On the other hand, they may be used unproductively for conspicuous consumption or for building on capital intensity into agriculture ; remittances may even erode work habits, since they increase resource base without the need for any effort on the part of the recipient. In addition, the full effect of remittances on the level and distribution of income in rural areas will depend on their size and frequency. These inturn will depend on the type of migration (temporary, seasonal or permanent), the type of job on which migrants are employed, their incomes, their living costs (which determine their capacity to save), the extent of their interest in the household land, the needs of the family members they have left behind.

As regards the reasons for contacts with the place of origin, the study showed that 9.5 percent of the total migrants have their household members (dependents) in their places of origin. Sixty five percent of the migrants possess land, house and any other property in their places of origin.

Around 48 percent of the total migrants expressed that they visited their villages to see their parents and relatives. The next important purpose of the visits was to attend religious festivals (26 percent). A little more than 25 percent of the workers reported that they made frequent

visits for other reasons such as to look after the property and meeting family obligations.

Persons in the age group below 20 years remit a very high proportion (54 percent) of their income, as they were unmarried. However, the number was very small (5.6 percent). Of the remaining migrants, the highest percentage of income remitted was by those who were in the age group of 40 – 50 years. This is partly due to a rise in income. By and large, as the length of stay increases, the proportion of remittances to income falls. This is expected since with the increase in the length of the stay, the workers may require more money to maintain their families.

Table X gives information on the amount remitted by the respondents and the reasons for the transferred money which has been used at the places of their origin.

TABLE X
DISTRIBUTION OF MIGRANTS BY THE AMOUNT OF REMITTANCES AND
REASONS FOR REMITTING

S.No.	Amount (in Rs.) / month	Frequency (700)	Percent
1.	No remittances	468	66.86
2.	250 – 500	55	7.86
3.	500 – 750	98	14.00
4.	750 – 1000	23	3.29
5.	1000 – 1250	40	5.71
6.	1250 – 1500	7	1.00
7.	1500 – 1750	8	1.14
8.	1750 – 2000	0	0.00
9.	2205 – 2500	0	0.00
10.	2500 – 2700	1	0.14
	Reasons for remitting		
1.	Consumption purpose	69	9.86
2.	Marriage expenses	16	2.29
3.	To meet school expenses of children left behind	26	3.71
4.	Crop cultivation expenses	26	3.71
5.	To meet maintenance expenses of house and construction of house	34	4.85
6.	To buy agricultural land	24	3.43
7.	Make improvement on existing land	23	3.29
8.	To meet health expenses	14	2.00
9.	No remittance	468	66.86

The study also showed that the proportion of remittances to income generally declined with the increase in monthly income ; as the workers started earning more, they preferred to acquire household articles, spend more on recreation and tried to improve their standard of living, which resulted in a decline in the amount remitted. Similar findings were reported by (Bora, 1996) who pointed out that the proportion of income remitted was high among low income earners in hilly region of Uttar Pradesh.

About 10 percent of the workers remitted money to meet the day-to-day consumption needs of their old parents and parents-in-law and also the expenses towards certain ceremonies and functions. Five percent of the total workers seemed to have remitted money for making improvements in the already existing houses and to build new houses. A little less than 5.0 percent of the workers remitted money to their places of origin which was found used for productive purpose like purchase of agricultural implements and for meeting crop expenses and in meeting the educational expenditure of their children left behind at the place of origin.

B. ECONOMETRIC ANALYSIS

This section presents and discusses the estimations of the migration status function, wage and labour supply functions and remittance functions.

1. Estimates of Migration Status Functions

The summary statistics of the variables used in migration status function namely their means, standard deviation are given in Table XI.

TABLE XI
SUMMARY STATISTICS OF THE MIGRANT STATUS FUNCTION

S.No.	Variable	Mean	Standard Deviation
1.	Sex	1.4800	0.4998
2.	Marital status	0.8829	0.6210
3.	Age	30.3152	8.3550
4.	Age squared	988.7533	573.0866
5.	Education	0.3676	0.4824
6.	Landed households	0.7648	0.4266
7.	Number of households reporting no house	0.6495	0.4773
8.	Log of income differentials	7.1101	0.5081
9.	Incidence of unemployment	4.1676	6.4157
	Dependent variable : Type of worker	0.667	0.4716

Typically the workers in the brick industry were 30 years of age on an average. Seventy seven percent of them came from landless households and 65 percent did not own any house property. Eighty eight percent of them were unmarried.

The correlation matrix involving the variables used in migration status function is given in Table XII.

TABLE XII
CORRELATION MATRIX INVOLVING THE VARIABLES USED IN MIGRATION STATUS FUNCTION

Variables	Type of worker	Sex	Marital status	Age	Age squared	Education	Landed households	Households with house	Log of income differentials	Incidence of unemployment
Type of worker	1.00000									
Sex	-0.06875	1.00000								
Marital status	0.68998	0.01855	1.00000							
Age	-0.15136	-0.27002	-0.34231	1.00000						
Age squared	-0.15642	-0.24800	-0.30016	0.98588	1.00000					
Education	-0.09358	-0.09995	0.03569	-0.14397	-0.11602	1.00000				
Landed households	0.18795	0.01592	0.01823	-0.12280	-0.14748	-0.18622	1.00000			
Households with house	-0.51518	0.00256	-0.46984	0.10159	0.09842	0.01359	0.08629	1.00000		
Log of income differentials	-0.34226	-0.54609	-0.32962	0.34518	0.32530	0.02701	0.04711	0.23628	1.00000	
Incidence of unemployment	0.14891	0.00729	0.04943	-0.1786	-0.02436	-0.08307	0.18091	0.00550	-0.3217	1.00000

There was no multicollinearity among the variables used in migration status function other than age, age squared which had correlation co-efficient 0.99 as is to be expected. In respect of all other correlations the co-efficient was less than 0.69, between marital status and type of worker (migrant and non-migrant). The absence of multicollinearity indicated that there was a possibility of getting a good fit for the estimated equation.

The probability model estimated to understand the determinants of the migration behaviour of workers was of the form

$$Y = a_0 + a_1 X_1 + a_2 X_2 + a_3 X_3 + a_4 X_4 + a_5 X_5 + a_6 X_6 + a_7 X_7 + a_8 X_8 + a_9 X_9 + e$$

where

- Y - is a dependent binary - dummy variable, taking the value one if migrant worker zero otherwise
- X₁ - Sex - dummy one if male ; zero otherwise
- X₂ - Marital status - dummy one if unmarried and single ; zero otherwise.
- X₃ - Age in years (current age)
- X₄ - Age squared
- X₅ - Education - dummy one for all levels of education ; zero otherwise.
- X₆ - Land holding - dummy one if no land possessed ; zero otherwise.
- X₇ - Number of households with houses - dummy one if no possession of house ; zero otherwise.

- X_8 - Natural log of income differentials (current wages – old wages)
- X_9 - Incidence of unemployment (days of unemployment at the place of origin as recorded per month)
- a_0 - Constant
- e - Error term

The personal characteristics of the workers namely age, sex, marital status and education were expected to have a positive effect on their probability to migrate in search of work while the family characteristics namely, landlessness, houselessness also were expected to increase their probability of migration. The log of the wage differentials between the current wage rates and pre-migration wage rates was expected to have a positive effect on their probability of migration. The economic distress of workers in the home area in terms of severity of unemployment was supposed to push the workers more towards migration.

Against these apriori expectations, the slope co-efficients derived from LPM and the maximum likelihood estimates of the Logit model are reported in Table XIII.

TABLE XIII
MIGRATION STATUS EQUATION AND THE SLOPE CO-EFFICIENTS OF
ALTERNATIVE MODELS OF ESTIMATION

(N : 1050)

S.No.	Variable	Co-efficients in	
		Linear Probability model	Logit model
1.	Sex	-0.1701* (0.0220) (-7.717)	-2.9010* (0.5116) (-5.67)
2.	Marital Status	0.4376* (0.0182) (24.049)	38 (1088) (0.04)
3.	Age	0.0534* (0.0069) (7.768)	0.7818* (0.1330) (5.88)
4.	Age squared	-0.0006836* (0.000097689) (-6.998)	-0.009375* (0.001782) (5.26)
5.	Education	-0.0411** (0.0192) (-2.146)	0.0563 (0.3671) (0.15)
6.	Land	0.2027* (0.0218) (9.308)	1.9899* (0.5365) (3.71)
7.	House	-0.2095* (0.0212) (-9.881)	-18.6* (667.3) (-0.03)
8.	Log of wage differential	-0.2432* (0.0227) (-10.735)	-5.9791* (0.7500) (-7.97)
9.	Days of unemployment	0.0055* (0.0014) (3.951)	0.06225** (0.03302) (1.89)
	Constant	1.2919	13.2 (859.5) (0.02)
	R squared	0.6452	
	F ratio	210.116	
	Log-likelihood ratio	-114.279	-116.952
	@ Somers' D		0.98

Foot Note : The term in the first bracket gives standard error of the estimate and the second term in the brackets stand for 't' value in LPM model, and 'z' value in the rest.

* Significant at one percent level ($t_{0.01} = 2.576$)

** Significant at five percent level ($t_{0.05} = 1.96$)

@ Somers' D is a goodness of fit measure which takes into account both preponderance of pairs of response frequencies and predicted probability as well as ties (Cohen and Holliday, 1982).

Though the co-efficients of the variable sex emerged significantly, it came out with an inconsistent negative sign. The apriori expectation for the co-efficient was that it would turn out positive, implying that the probability of migration was higher among male workers rather than among female workers, with the male worker being assigned the value of one as against the females who were assigned the value of zero. This finding, contrary to the expectation, implied that sex was not an important factor among the factors influencing migration. Several studies that focussed on women in specific occupations of the informal sector Gulathi (1987), Gupta (1990), Pandey (1993), Reddy (1991), Sinha and Ranade (1975), Shah (1983), Pathare (1995), Sundari and Ruckmani (1998), Kumar and Tataji (1998) recorded that a majority of women have migrated from rural area and they provide a greater dimension in migration.

The co-efficient of age had a non-linear relationship with the probability of migration in that age variable came out with a positive expected magnitude in all estimations, whereas the variable age squared came out with negative and significant magnitude in all of them. The migrants happen to be younger and the tendency to migrate declined with the age of the worker. The findings of Dubey et al. (1995), Chand et al. (1998), Singh (1986), Krishnaiah (1997), Gupta and Prajapati (1998), Cerruti and Massay (2001) are similar to the findings of

the current study in that the younger the individual more is the likelihood of migration.

Migration was directly associated with lack of assets for the families in their home area particularly productive assets like availability of land holdings. The dummy for landholdings which was assigned the value of one when the family was landless and zero when they happened to be landed households turned out statistically significant co-efficient in all the three estimations, highlighting that non-availability of assets in the form of land increased the probability of migration. Choudhary (1991) in his case study on migration of rural labour in Samastipur district of Bihar indicated that all the temporary out migrants were landless and belonged to socially and economically backward classes. The membership of house property did not, however, emerged as a significant variable, in that, it came out with an inappropriate negative sign which was any way insignificant in the Logit and Probit estimation. It implies that ownership of a dwelling by itself is not a deciding factor in influencing their decision to migrate.

The investigator had attempted to check the validity of the hypothesis that migration was a response to expected wage differentials between the pre-migration employment and post-migration employment. Since there was no possibility of getting the data on the expected wage differentials at the time these workers had migrated, this variable was provided by actual wage differentials, between the two types of

employment. For the non-migrant workers the difference between their current employment and previous employment was taken. The co-efficient of this variable however came out with an inconsistent and statistically significant negative sign in all the estimations. It gave strength to the proposition that it is certainty of finding the job in out-migration area and the assurance of continuous employment that were important factors in influencing their migration decisions.

Joshi and Padasla (1991) cited Adam Smith (1776), in stating that in making labour market choices workers were not motivated solely by the wages paid but also by non-market considerations in wage differentials, was in sufficient condition for workers to migrate from one location to another. Therefore this finding is in agreement with that of Joshi and Padasla (1991) that it is not just the expected income differentials but the probability of finding an assured job in the new place. They further remarked that people wish to migrate because of economic difficulties at home, such as insufficient land, or unemployment and better employment opportunities. Chand et al. (1998) observed that the aspirations dominant in the minds of the most of the respondents in Punjab and Madhya Pradesh. Gupta and Prajapati (1998) in their studies remarked that the most dominant aspiration for the respondents covered under study was the assurance of getting regular work and it is not expected income differentials that motivated the workers to migrate but the probability of finding an assured job in sample.

The co-efficient of the incidence of unemployment in the home area had positively influenced the probability of migration, as shown by statistically significant positive co-efficient for this variable in all the estimations.

The overall explanatory power of the variables chosen in this model was 64.5 percent with a F ratio of 210.11 showing that the chosen variables had good explanatory power in describing the probability of migration among the workers in the sample. Somer's D in the Logit model was 0.98 implying that predicted frequencies and response frequencies tallied in 98 percent of the cases.

The three co-efficients which emerged significant in this analysis of factors influencing migration behaviour were age, landlessness and incidence of unemployment in the home area. Taking the antilog. of the slope co-efficients, subtracting one from it and multiplying by 100, we get the percentage change in the odds ratio for a unit increase in the explanatory variable (Gujarathi, 1985). In respect of age, the odds ratio in favour of migration increased by 19 percent. Of course, the tendency to migrate has a non-linear relationship with age. The extent of landlessness similarly increases the odds ratio in favour of migration by 56 percent. The incidence of unemployment increases the probability of migration by 1.4 percent.

Measures of Elasticities in the Migration Function Equation

The elasticity estimates of the factors determining migration decision were computed by using the formula

$$\eta = \frac{\partial P}{\partial X} \frac{\bar{X}}{\bar{P}}$$

where

$\frac{\partial P}{\partial X}$ is the marginal effect or the co-efficients

$\bar{X}$ - mean of the respective variable

$\bar{P}$ - mean of the dependent variable, namely the probability of migration

The marginal effects from Logit co-efficients were computed using the formula

$$\frac{\partial P}{\partial X_j} = \bar{\beta}_j [\bar{P} (1 - p)]$$

where

$\bar{\beta}_j$ - slope co-efficient of the Logit function

$\bar{P}$ - mean probability of the worker being a migrant

The marginal effects and the corresponding elasticity measures arising from Logit estimation are given in Table XIV.

TABLE XIV
MEASURES OF MARGINAL EFFECTS AND ELASTICITIES OF
THE MIGRATION STATUS FUNCTION – LOGIT MODEL

S.No.	Variable	Marginal Effect	Elasticity Measure
1.	Sex	-0.6440*	-1.4296*
2.	Marital Status	8.4436	11.1817
3.	Age	0.1737*	7.898*
4.	Education	0.0125	0.0068
5.	Landless households	0.4421*	0.5071*
6.	Houseless households	-4.1329	-0.0402
7.	Log wage differential	-1.3285*	-14.1679*
8.	Incidence of unemployment	0.0138*	0.0862*

* indicates that slope co-efficient of Logit estimates were significant at one percent level.

A percentage increase in the age could be expected to increase the probability of migration by about eight percent. A percentage increase in the number of landless households could be increasing the probability of migration by one half of one percent. A percentage increase in the incidence of unemployment could increase the probability of migration by about one-tenth of one percent.

2. Estimates of Wage and Labour Supply Functions

The two stage least square framework was used to fit the wage and labour supply function. In the wage equations, the Inverse of Mill's Ratio (IMR) derived from migration status function was incorporated as an additional regressor. This was done to check for the selectivity bias as the industry had a specific preference for migrant workers. The predicted wages derived from wage equations were used as an instrumental variable in the place of observed wages in the estimation of labour supply functions.

The wage equation was of the form

$$\ln W = a_0 + a_1 X_1 + a_2 X_2 + a_3 X_3 + a_4 X_4 + a_5 X_5 + a_6 X_6 + a_7 X_7$$

where

$\ln W$ - stands for natural logarithm of daily wage rate

a_0 - constant

X_1 - Age

X_2 - $\text{Age}^2 / 10$

- X_3 - Education - dummy one for all levels of education ; zero otherwise
- X_4 - Experience (Age – Schooling years – 5)
- X_5 - Experience² / 10
- X_6 - Sex - dummy one for male ; zero otherwise.
- X_7 - Inverse of Mill's ratio
- a_1 to a_7 - Co-efficients
- e - Error term

The labour supply equation was of the form

$$\begin{aligned} LS = & b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 + b_7 X_7 \\ & + b_8 X_8 + b_9 X_9 + b_{10} X_{10} + b_{11} X_{11} + b_{12} X_{12} + b_{13} X_{13} \\ & + b_{14} X_{14} + b_{15} X_{15} + e \end{aligned}$$

where

- LS - number of annual days worked.
- b_0 - constant
- X_1 - Predicted wage rate
- X_2 - Age
- X_3 - Marital status - dummy one if unmarried, separated or widowed ; zero otherwise.
- X_4 - Illness days reported per month
- X_5 - Body mass index
- X_6 - Number of children below five years
- X_7 - Number of children between 5 – 10 years
- X_8 - Number of children between 10 – 15 years
- X_9 - Number of children more than 15 years

- X_{10} - Number of dependents – dummy one if dependents present ; zero otherwise.
- X_{11} - Total family earnings in rupees per month
- X_{12} - Spouse's occupation - dummy one if employed ; zero otherwise.
- X_{13} - Spouse's income in rupees per month
- X_{14} - Children income in rupees per month
- X_{15} - Return migration - dummy if the worker intends to go back ; zero otherwise.
- b_1 to b_{15} - Co-efficients
- e - Error term

Among other things, wages were presumed to go up with increase in age and experience. The higher order of these variables were introduced to capture their non-linear effects if any. Labour supply was postulated to be a positive function of wage rate. Personal characteristics of the workers namely age, marital status and health status variables were presumed to influence the labour supply positively. The variables of children in different age groups, dependents, family earnings, spouse's education, earnings, children's earnings proxied for reservation wages, all of them raising or lowering the reservation wages and hence lowering or raising the labour supply at a given market wage rate, depending on whether workers are men or women. The variable of return migration, namely, the intention of the worker to get back home eventually was supposed to raise the quantum of labour supplied at a given wage rate.

Seven sets of wage and labour supply equations were estimated for the following groups : the entire sample of workers, migrant workers, non-migrant workers, migrant male workers, migrant female workers, non-migrant male workers, non-migrant female workers.

The summary statistics of the variables involved in these equations and their correlation matrices are given in Appendices III and IV.

The estimated co-efficients of wage and labour supply equations of migrant and non-migrant and all workers are given in Table XV.

TABLE XV

**ESTIMATED CO-EFFICIENTS OF WAGE AND LABOUR SUPPLY
EQUATIONS –MIGRANT, NON-MIGRANT AND ALL WORKERS**

S.No.	Variable	Migrant workers (700)	Non-migrant workers (350)	All workers (1050)
A. Wage Equation				
1.	Age	0.0346* (0.0103) (3.357)	0.0053 (0.0131) (0.406)	0.0264* (0.0074) (3.571)
2.	Age squared / 10	-0.0044* (0.0011) (-3.978)	0.000102094 (0.0019) (0.054)	-0.0030* (0.00096591) (-3.103)
3.	Education	-0.0024 0.0714 (-0.034)	-0.0451 (0.682) (-0.661)	-0.0193 (-0.0444) (-0.435)
4.	Experience	-0.0050 (0.0079) (-0.635)	0.000965634 (0.0075) (0.129)	-0.0042 (0.0050) (-0.834)
5.	Experience squared / 10	0.0018** (0.00083803) (2.123)	-0.0012 (0.0014) (-0.860)	0.00083951 (0.000729132) (1.151)
6.	Sex	0.5194* (0.0126) (41.373)	0.4573* (0.0264) (17.301)	0.4975* (0.0124) (40.269)
7.	Inverse of mills' ratio	0.0034 (0.0148) (0.232)	0.1370* (0.0369) (3.709)	0.0295* (0.0096) (3.079)
	Constant	3.4207	4.0179	3.5706
	R ²	0.7843	0.5259	0.6800
	F	359.454	54.195	316.268
B. Labour Supply Equation				
1.	Predicted wage rate	-0.1747* (0.0332) (-5.264)	0.0504 (0.0289) (1.743)	0.0025* (0.00047287) (5.370)
2.	Age	-0.2552** (0.1164) (-2.193)	0.1076 (0.1312) (0.820)	-0.2014** (0.0910) (-2.214)
3.	Marital status	5.1326 (2.8929) (1.774)	3.8628 (2.1173) (1.824)	9.2728* (1.7584) (5.274)
4.	Illness days	1.8765** (0.7360) (2.550)	-5.3957* (0.9606) (-5.617)	-0.0877 (0.6208) (-0.141)
5.	Body mass index	-1.1197* (0.1893) (-5.916)	-0.3216 (0.2139) (-1.503)	-0.9629* (0.1526) (-6.309)
6.	Children below 5 years	-1.0921 (0.9640) (-1.133)	0.4513 (1.4828) (0.304)	-1.3986 (0.8261) (-1.693)
7.	Children below 5-10 years	1.0569 (1.0089) (1.048)	1.1076 (1.1250) (0.985)	0.5326 (0.8122) (0.656)
8.	Children between 10-15 years	1.4527 (1.4463) (1.004)	-0.3473 (1.5085) (-0.230)	1.0822 (1.1264) (0.961)
9.	Children more than 15 years	3.8016 (5.9667) (0.637)	-0.9342 (2.8635) (-0.326)	3.7343 (2.7543) (1.356)
10.	Number of dependents	-0.7464 (0.7875) (-0.948)	-1.5060 (1.0573) (-1.424)	-1.1438 (0.6612) (-1.730)
11.	Family earnings	0.0234* (0.0015) (15.126)	0.0046* (0.0014) (3.181)	0.0137* (0.0010) (13.401)
12.	Spouse occupation	-7.7386* (2.9534) (-2.620)	-0.7964 (0.8067) (-0.987)	-1.1425 (0.9534) (-1.198)
13.	Spouse income	-0.0122* (0.0061) (-7.717)	-0.0030** (0.0013) (-2.260)	-0.0052* (0.000937965) (-5.525)
14.	Children income	-0.0206* (0.0057) (-3.638)	0.0044 (0.0043) (1.031)	-0.0084* (0.0030) (-2.773)
15.	Return migration	0.2452 (2.0393) (0.120)	-	-
	Constant	167.8494	172.0245	165.5316
	R ²	0.3363	0.1917	0.2230
	F	23.107	5.675	21.215

Foot Note :

* Significant at one percent level ($t_{0.01} = 2.576$)** Significant at five percent level ($t_{0.05} = 1.96$)

The co-efficient of the selectivity bias variable namely the inverse of Mill's ratio (IMR) turned out with a significant positive sign in respect of the whole sample as well as the non-migrant workers, showing that there was self selection in respect of these groups. The most productive among the workers appeared to have got selected into this sample. Among the migrant group of workers, the selectivity bias was not important, implying that there were no substantive differences among the individual workers in this group with respect to their productivity characteristics.

Age had a non-linear effect on the earnings of the overall group of workers and the migrant workers, wages tended to increase with age, but at the age of 25 years for the entire group and at 30 years for migrant workers. However, the age factor did not influence the earnings of the total workers.

Next to age, the wages depended on the sex of the workers, with this variable turning out positive and significant among all the three groups of the migrants, non-migrants and the entire group. The male wages were higher than female wages by 52 percent among migrant workers, 46 percent higher among non-migrant workers and 50 percent higher among all categories. The male earnings were much higher than that of earnings of female workers partly because they were engaged in much more arduous and physically demanding tasks than women and hence were given a higher rate of compensation. Men were employed in activities like mixing clay and sand, moulding and firing bricks, attending to the burner, loading and unloading activities, which were round the clock jobs.

Women were employed in transfer of moulded bricks from the table to the sheds and from sheds to the lorries for firing. Sex wise segregation of tasks is not a specific feature of the brick industry alone. It is observed in all industries and due to this factor, among others, the wages of women were lower than that of men.

The variable in the wage equation could explain 53 to 78 percent of the variations in wage rates across the groups of migrant and non-migrant workers.

Compared to wage equations, the labour supply had relatively low explanatory power ranging from 19 percent to 34 percent.

In the labour supply equation of all workers, wage rate had a theoretically consistent, positive and significant effect on the labour supply, signifying that substitution effect overwhelmed income effect for these workers and they were willing to increase the supply of their labour supply at higher wage rates. The personal characteristics of age and long term health measure (BMI) reduced the labour supplied, other things remaining the same. The nature of tasks in the industry being arduous, it is clear that the industry preferred workers in the younger age range rather than older workers. The body mass index being a long term health measure is a summary indicator of the well being of the worker. The better the well being, the less was the need to work and hence the less was the quantum of labour supplied to the industry. The more the number of single workers, the more was the quantity of labour supplied.

Among the variables influencing the reservation wages, children over 15 years and non-labour income of the family came up with significant and positive signs showing that the larger the number of such children and the larger the incomes, the greater was their desire to work in the interest of adding further to their family incomes.

Income earned by the spouse and children, however, raised their reservation wages and reduced the days of labour supplied by the respondents to the market. Similar findings were reported by Hill (1983) and Sanfraz (1979).

The labour supply equations for migrant workers exhibited the following characteristics : The wage variable had a significantly negative co-efficient, showing that the income effect outweighed the substitution effect for them. As wages increased, they reduced the quantum of labour supplied by them. This group of workers were also predominantly single workers and were young. With increase in age, the labour supplied by them tended to decline, as shown by its significantly negative effect. The long term health measure was negatively associated with the labour supplied. The short term health measure was positively related to labour supply implying that sickness did not keep them back from work.

The co-efficients of children over 15 years and family earnings behaved as in the equation for the whole sample. The variables impacting directly on reservation wages namely spouse's occupation and income, children's income had significantly negative co-efficients implying that the

pressure of these factors raised their reservation wages and hence lowered the quantity of labour supplied by them to the employment at the going wage rate. Their intention to return home did make them work longer, as is shown by the positively significant co-efficient of their variable. In contrast to these findings, Greenbagh (1980), Khandker (1987) reported that children above seven years had a positive effect on labour supply.

As for non-migrants, they were also by and large single workers but the co-efficients of marital status was significant only at 10 percent level. Their labour supply was not influenced by age, or long term health. Illness in the short-term did reduce the number of days of labour supplied by them significantly.

As in the other two groups, the number of children over 15 years and family earnings exerted a significantly positive effect on the labour supplied them. Among the other factors influencing their reservation wages, only spouse's income tended to reduce their labour supply.

In all these groups, children below 15 years did not appear as a constraining variable, limiting their labour supply.

To examine whether the wage and labour supply functions were different among migrant and non-migrant male workers and among migrant and non-migrant female workers, these functions were fitted separately for these sub-groups and the results are given in Table XVI.

TABLE XVI

**ESTIMATED CO-EFFICIENTS OF WAGE AND LABOUR SUPPLY EQUATIONS
BY SEX-WISE DISTRIBUTION OF MIGRANT AND NON-MIGRANT WORKERS**

S.No.	Variable	Migrant male workers (381)	Non-migrant male workers (165)	Migrant female workers (319)	Non-migrant female workers (185)
A.	Wage Equation				
1.	Age	0.0437* (0.0148) (2.951)	-0.0023 (0.0213) (-0.109)	0.0387* (0.0150) (2.580)	0.0073 (0.0253) (0.288)
2.	Age squared / 10	-0.0065* (0.0015) (-4.197)	0.0017 (0.0031) (0.561)	-0.0033 (0.0024) (-1.396)	-0.0059 (0.0035) (-1.682)
3.	Education	0.0656 (0.1019) (-0.644)	-0.0787 (0.0916) (-0.859)	-0.1362 (0.1013) (-1.345)	0.2639 (0.1738) (1.519)
4.	Experience	-0.0020 (0.0110) (-0.182)	-0.0008455 (0.0098) (-0.087)	-0.0173 (0.0114) (-1.519)	0.0299 (0.0179) (1.670)
5.	Experience squared / 10	0.0026** (0.0012) (2.181)	-0.0016 (0.0021) (-0.755)	0.0014 (0.0019) (0.730)	0.00035484 (0.0022) (0.163)
6.	Inverse of mills' ratio	-0.0207 (0.0222) (-0.933)	0.0908 (0.0497) (1.828)	0.0278 (0.0187) (1.482)	0.2736* (0.0620) (4.413)
	Constant	3.7302	4.5910	3.5073	3.8072
	R ²	0.2387	0.0385	0.1646	0.1155
	F	19.546	1.056	10.247	3.865
B.	Labour Supply Equation				
1.	Predicted wage rate	-0.0049 (0.0043) (-1.132)	-0.0463 (0.0358) (-1.311)	-0.0113 (0.0079) (-1.429)	-0.0233 (0.0545) (-0.427)
2.	Age	-0.0579* (0.0189) (-3.062)	0.0441 (0.1820) (0.242)	-0.0310 (0.0193) (-1.605)	0.0394 (0.1780) (0.222)
3.	Marital status	0.7559 (0.4799) (1.575)	-1.7019 (3.0723) (-0.554)	0.1764 (0.5204) (0.339)	6.2544** (2.9265) (2.137)
4.	Illness days	0.2593** (0.1196) (2.168)	-4.2091* (1.3688) (-3.075)	0.0978 (0.1277) (0.765)	-5.4795* (1.2820) (-4.274)
5.	Body mass index	-0.1354* (0.0304) (-4.460)	-0.4290 (0.3016) (-1.422)	-0.0472 (0.0362) (-1.306)	-0.1111 (0.2935) (-0.379)
6.	Children below 5 years	-0.3342** (0.1610) (-2.076)	1.9390 (2.1949) (0.883)	0.0236 (0.1703) (0.138)	0.1558 (1.9023) (0.082)
7.	Children below 5-10 years	-0.0422 (0.1680) (-0.252)	3.6060** (1.7861) (2.019)	-0.1613 (0.1763) (-0.915)	0.7547 (1.5709) (0.480)
8.	Children between 10-15 years	-0.2482 (0.2493) (-0.995)	1.9172 (2.3125) (0.829)	0.2157 (0.2430) (0.887)	-0.1926 (2.1177) (-0.091)
9.	Children more than 15 years	0.7340 (0.9866) (0.744)	1.8079 (3.6145) (0.500)	-0.9388 (1.2190) (-0.770)	0.9640 (4.3564) (0.221)
10.	Number of dependents	-0.0829 (0.1300) (-0.638)	-0.0892 (1.4477) (-0.062)	-0.0658 (0.1348) (-0.488)	-1.7916 (1.4903) (-1.202)
11.	Family earnings	0.0036* (0.000252939) (14.057)	-0.0044 (0.0022) (-1.979)	0.0047* (0.000403245) (11.760)	0.0171* (0.0027) (6.248)
12.	Spouse occupation	-0.9933** (0.4322) (-2.298)	-2.6085 (2.5544) (-1.021)	-1.0570 (0.6391) (-1.654)	-0.6139 (0.8407) (-0.730)
13.	Spouse income	-0.0022* (0.000305484) (-7.092)	0.0047** (0.0020) (2.399)	-0.0038* (0.000410879) (-9.237)	-0.0145* (0.0028) (-5.180)
14.	Children income	-0.0035* (0.000834668) (-4.246)	0.0078 (0.0053) (1.482)	-0.0033* (0.0013) (-2.613)	-0.0058 (0.0069) (-0.836)
15.	Return migration	-0.0193 (0.3540) (0.054)	-	-0.5852 (0.3339) (-1.453)	-
	Constant	18.7735	205.1440	17.8335	155.4814
	R ²	0.4536	0.1321	0.3632	0.3631
	F	20.197	1.631	11.522	6.921

Foot Note :

* Significant at one percent level ($t_{0.01} = 2.576$)** Significant at five percent level ($t_{0.05} = 1.96$)

The non-linear effect of equations on wages was clearly manifested only in the wage function of male migrants, with both the co-efficients having statistically significant a priori sign. The wages increased with age at an decreasing rate and peaked at the age of 30 years for these workers. The only other term that had a positive significant sign was the experience squared term.

In the wage function of non-migrant male workers however, no explanatory variable other than inverse of Mill's ratio (IMR) was significant. With the co-efficient of multiple determination as low as four percent. None of these factors apparently had any influence on their earnings indicating the near total reliance of the industry on migrant workers.

The age co-efficients in female wage equation turned out with expected apriori signs but only that of the age term of migrant female workers was significant. Only the co-efficient of inverse of Mill's ratio of female non-migrants was significant, showing that these workers who found employment were more productive than others remaining out of labour force.

In the labour supply equation, predicted wage rate had a negative co-efficient, though not statistically significant in all the four cases. Age again was a significant factor influencing negatively the labour supply only in the case of migrant male labour.

The non-migrant female labour working in the industry belonged to the unmarried group, showing that it was a kind of temporary employment for these women until their marriage. Non-migrant labour male as well as female abstained from work because of ill health in the short run. But migrant men workers continued working in spite of sickness.

Return migration did not significantly influence the number of days of labour supplied either by the male or female workers in the migrant group. Spouse income affected negatively the days of employment of all categories of workers other than that of non-migrants. Child income significantly influenced the reservation wages of only the male and female migrant labour and not those of the non-migrant workers.

3. Determinants of Remittance Behaviour

The remittance behaviour of the migrants was studied in two parts namely the factors influencing the decision to remit and the factors influencing the amount remitted. The factors influencing the decision to remit was modeled using LPM and Tobit functions, where the decision to remit was defined as a binary variable taking the value one and zero, depending on whether the worker was found remitting or not. The determinants of amounts remitted were identified by OLS procedure.

The summary statistics of the variables used in the estimation of remittance functions are given in Table XVII.

TABLE XVII
SUMMARY STATISTICS OF THE VARIABLES USED IN
REMITTANCE FUNCTIONS

(N : 700)

S.No.	Variable	Mean	Standard Deviation
1.	Worker's earnings	1670.3071	560.8045
2.	Worker's earnings squared	3103978.3214	2057442.8272
3.	Number of family members involved in migration	0.5257	0.4997
4.	Marital status	1.1857	0.4505
5.	School going children at the origin	0.3914	0.6710
6.	Return migration	0.0900	0.2864
7.	Possession of ancestral property	0.8214	0.3833
8.	Migration period	5.3521	3.3516
9.	Age	29.4214	7.7370
10.	Age squared	925.3957	517.0523
11.	Number of dependents	0.4543	0.7465
12.	Children at the place of destination	0.3914	0.6710
	Dependent variables :		
	1. Dependent variable – dummy one if the migrant remits ; zero otherwise	0.3314285714	0.471063344
	2. Natural log of amount remitted	6.3766	0.5963

Out of the 700 migrant workers one-third of them were in the habit of making remittances out of their incomes to the family members in their home areas. On an average, they remitted an amount of Rs.221 out of their mean earnings of Rs.1670 per month, the proportion of amount remitted was 6.93 percent of their mean incomes. The mean earnings of the workers ranged from Rs.1110 to Rs.2230 per month (rounded to nearest Rs.10) and amount remitted varied between Rs.250 and Rs.1500 per month.

Among the migrant workers, only 9.0 percent reported that they would like to go back to their native place once they earned enough and realised their purpose in the place of work. Eighty two percent of the migrant had some property or other, either dwellings of their own or some amount of land which enabled them to do some kind of cultivation and realise certain level of income.

The mean age of the migrant worker was 29 years which varied between 15 to 37 years. Forty five percent of them had left behind their parents or other elders in their families in their home area.

The correlation matrix involving these variables is given in Table XVIII.

TABLE XVIII
CORRELATION MATRIX INVOLVING THE VARIABLES USED IN REMITTANCE FUNCTIONS

Variable	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	X ₁₂	X ₁₃
X ₁ - Remittance ratio	1.00000												
X ₅ - Marital status	0.07794	1.00000											
X ₉ - Migration period	0.08090	0.98914	1.00000										
X ₁₃ - Children at destination	-0.00967	0.08649	0.07374	1.00000									
	-0.02959	-0.15102	-0.15156	0.24567	1.00000								
	0.03563	0.17448	0.17934	-0.01299	-0.17929	1.00000							
	0.24272	0.06004	0.07168	0.02879	0.02550	0.07697	1.00000						
	-0.21489	0.09011	0.09313	-0.13659	-0.33794	0.9973	-0.7494	1.00000					
	0.12832	0.35901	0.36225	-0.2288	-0.25884	0.35495	0.01910	0.15917	1.00000				
	0.14334	0.40790	0.40559	0.07667	-0.28846	0.42037	0.3128	0.16050	0.70019	1.00000			
	0.14315	0.36996	0.37080	0.10703	-0.23260	0.38062	0.02773	0.12905	0.67006	0.98539	1.00000		
	0.40487	-0.02791	-0.03263	0.03384	0.08058	-0.08989	0.16314	-0.10608	-0.06923	-0.04335	-0.04149	1.00000	
	0.3563	0.17448	0.17934	-0.01299	-0.17929	1.00000	0.07697	0.09973	0.3495	0.42037	0.38062	-0.08989	1.00000

X₃ - Worker earnings squared

X₄ - Number involved in migration

X₈ - Position of property

X₁₂ - Dependents

X₇ - Return migration

X₁₁ - Age squared

X₂ - Workers earning

X₆ - School going children at the origin

X₁₀ - Age

The equation used in the decision to remit function was of the form

$$Y = a_0 + a_1 X_1 + a_2 X_2 + a_3 X_3 + a_4 X_4 + a_5 X_5 + a_6 X_6 + a_7 X_7 \\ + a_8 X_8 + a_9 X_9 + a_{10} X_{10} + a_{11} X_{11} + a_{12} X_{12} + e$$

where

- Y - is a dependent - dummy binary variable one if the migrant makes remittance ; zero otherwise.
- a_0 - constant
- X_1 - Income of the worker per month
- X_2 - Income^2
- X_3 - Family members involved in migration - dummy one if migrated alone / with family members ; zero otherwise.
- X_4 - Marital status - dummy one if unmarried / separated / widowed ; zero otherwise.
- X_5 - Number of school going children at the place of origin.
- X_6 - Return migration - dummy one if intends to return ; zero otherwise
- X_7 - Possession of ancestral property - dummy one if no land and house possessed ; zero otherwise.
- X_8 - Period of migration in years
- X_9 - Current age
- X_{10} - Age^2
- X_{11} - None of dependents - dummy one if dependents are present ; zero otherwise
- X_{12} - Number of school going children at destination
- a_1 to a_{12} - Co-efficients
- e - Error term

The relationship between the income of the worker and the decision about making remittance to his family at the origin is expected to be positive. If a migrant moves with members of his family – wife, elders and earning children, their family income will enhance and the increased amount set apart for making remittance will be more and positive. If a person is unmarried he is likely to have less obligation towards his family and the married persons due to his family commitments may decide to remit less. To the expected relationship between the marital status variable and probability of remittance may either take a positive or negative sign. If the migrant decides to return to his home area, he may decide to remit more out of his current income to accumulate assets to earn income in future. The longer the period a migrant stays in a place, lesser the probability of making remittance ; age variable is expected to exhibit either a positive or negative relationship with the decision to remit. Number of children and dependents at the place of origin may require transfer of more money towards their maintenance and at the place of destination may reduce the ability of the worker to make remittance. So the relationship between these two variables will be expected to be either positive and negative.

Since only a part of the migrants were found remitting while others did not, the decision to remit became a censored variable taking the threshold values of 0.000 at the lower limit and infinity at the upper limit, the Tobit function was used in preference to Logit and Probit models of

estimation (Maddala, 1983). Maddala (1983) had shown that the likelihood function for the Tobit model had a single maximum when the iteration is carried to its logical solution, a global maximum of likelihood function is obtained. The estimation resulting from this model will be consistent and asymptotically normal.

The marginal effects derived from the co-efficients of the primary index equation of the Tobit model together with its associated statistics are given in Table XIX. The LPM model using OLS procedure was also estimated for comparison purposes.

TABLE XIX
ESTIMATES OF THE DECISION TO REMIT FUNCTION - LPM SLOPE
CO-EFFICIENTS AND MARGINAL EFFECTS FROM THE TOBIT MODEL

S.No.	Variable	LPM	Tobit*
1.	Income of the worker	-0.00002643904595 (0.00015870702) (-0.167)	-0.001706704846 (-0.0016287087) (-1.048)
2.	Income squared	0.00000000518173408 (0.000000042620564) (0.122)	0.0000004668872232 0.00000043025416 (1.085)
3.	Number of family members involved in migration	0.0000387051471 (-0.03025653) (0.001)	-0.01010428065 (0.31109917) (-0.032)
4.	Marital status	-0.1066928345* (0.033148786) (-3.219)	-0.1405834795* (0.38038036) (-3.696)
5.	Number of school going children at the origin	-0.2885307633* (0.045638030) (-6.322)	-0.2006421893* (0.40898346) (-4.906)
6.	Return migration	0.4447028357* (0.050920633) (8.733)	0.3012870941* (0.44428150) (6.781)
7.	Ancestral property	-0.2504495724* (0.039452565) (-6.348)	-0.2348867276* (0.37948456) (-6.190)
8.	Migration period	0.003645151021 (0.0060204467) (0.605)	0.04213478111 (0.059865698) (0.704)
9.	Age	0.02527292542* (0.0085553438) (2.954)	0.09237085599 (0.086288717) (1.070)
10.	Age squared	-0.000278840897** (0.00012536485) (-2.224)	0.006767667 (0.001259095) (-0.538)
11.	Number of dependents	0.2203752248* (0.042543016) (11.308)	0.1809973527* (0.18624306) (9.718)
12.	School going children at destination	0.3192440073* (0.04254301) (7.504)	0.2405806892* (0.38125914) (6.310)
	R ² / Log likelihood ratio	0.3799	-495.7186

Foot Notes : Tobit values indicate the marginal effects of explanatory variables in the decision to remit.
The primary index equation co-efficients of the Tobit model were converted into marginal effects using the scale factor 0.3486.

* Significant at one percent level ($t_{0.01} = 2.576$)

** Significant at five percent level ($t_{0.05} = 1.960$)

The discussion that follows is based on the interpretation of marginal effects of Tobit model. The probability of a migrant worker remitting funds to his family was not dependent on the level of his income as was evident from the co-efficients of the first two variables namely workers' income and income squared. They carried theoretically inconsistent signs. The co-efficients of other members of the family involved in migration reduced the probability of remittances by one percent but again this co-efficient was not statistically significant. The dummy of marital status which was assigned a value of one for single and unmarried individuals and zero for married individuals emerged with a significant negative magnitude. Marriage of a worker reduced the probability of remittances being made by the migrant by 14 percent. The presence of children at school going age at the place of origin did not increase the obligation of the worker to remit his earnings to the family left behind by him. This co-efficient carried a contrary negative sign at one percent level of significance. These findings are in contrast with those of Duraisamy and Narasimhan (2000) who reported that number of children of the migrants left behind at the origin has a positive effect.

When the workers intended to return home and considered his stay at the place of destination as a temporary phenomenon, he tended to remit more to his family in the home area. In this case the variable of return migration was found to increase the probability of remittance by 30 percent. This finding is in accordance with the findings of Lucas and Stark (1985). The co-efficient of ancestral property carried a negative and statistically significant sign implying that the dependence of the family on

the migrant worker became less with availability of such fixed income earning assets in the home town. The availability of such assets decreased the probability of remittances by about 23 percent. The co-efficient of number of dependents left behind by the worker tended to increase his probability of remittance by 28 percent.

In the LPM model, the co-efficient of age and age squared came up with significant positive and negative values respectively showing that age had a non-linear relationship with probability of remittance, the probability of remittance increased with age but increased at a decreasing rate. The variable of school going children at the place of destination raised the probability of remittances significantly perhaps via the indirect effect, releasing more savings at the disposal of migrant worker since provisioning for children reduced as children get older.

In sum, the migrant workers felt an obligation to contribute to the families left behind by them when they happen to be married and when they were contemplating return migration. The presence of assets in the home area decreased their desire to remit.

The second part of the analysis of remittance behaviour examined the amount remitted by the migrant workers once they had decided to remit. In this model, the dependent variable was expressed, as natural logarithm of the amount remitted and was made a function of the same a set of variables that entered the decision equation.

Table XX gives the regression co-efficients of the equation involving the amount remitted as the dependent variable.

TABLE XX
REGRESSION CO-EFFICIENTS OF THE AMOUNT REMITTED FUNCTION

(N : 232)

S.No.	Variable	Estimated co-efficients without correcting for selectivity bias	Estimated co-efficients after correcting for selectivity bias
1.	Worker earning	0.000337538 (0.000412596) (0.818)	0.000367541 (0.000414565) (0.887)
2.	Worker earnings squared	-0.000000057172 (0.000000107592) (-0.531)	-0.000000066208 0.000000108249 (-0.612)
3.	Number of other family members involved in migration	-0.2207 (0.0763) (-2.893)	-0.2200* 0.0763 (-2.882)
4.	Marital status	-0.2861* (0.1061) (-2.696)	-0.2432 (0.1187) (-2.050)
5.	School going children at the origin	-0.0898 (0.0830) (-1.081)	-0.0302 (0.1108) (-0.273)
6.	Return migration	-0.1397 (0.0827) (-1.689)	-0.2382 (0.1469) (-1.622)
7.	Possession of ancestral property	-0.1077 (0.0848) (-1.270)	-0.0398 (0.1191) (-0.334)
8.	Migration period	0.0256 (0.0147) (1.738)	0.0237 (0.0149) (1.588)
9.	Age	0.0063 (0.0353) (0.178)	0.0048 (0.0354) (0.135)
10.	Age squared	0.000174136 (0.0004923791) (0.354)	0.000184959 (0.000492941) (0.375)
11.	Number of dependents	0.0348 (0.0402) (0.865)	-0.0174 (0.0759) (-0.229)
12.	Number of school going children at the destination	-0.0296 (0.771) (-0.384)	-0.0987 (0.1148) (-0.859)
13.	Inverse of Mill's ratio		-0.1419 (0.1746) 6.1267
	Constant	6.0092	6.1267
	R ²	0.24	0.246
	F	5.88	5.47

Foot Note :

* Significant at one percent level ($t_{0.01} = 2.576$)

The variables evaluated in this function could explain 25 percent of the changes in the amount of remittances made by 232 migrant workers who constituted one-third of the total. The 'F' ratio at 5.882 was statistically significant at 5.0 percent indicating the explanatory power of the variables used in the study, though R^2 was less.

In this equation worker's earnings and earnings squared came up with a expected positive and negative sign respectively, showing that the amount on an average increased with increase in earnings, making the average propensity to remit positive. The marginal propensity to remit given by the co-efficients of income squared was negative showing that the marginal propensity to remit decrease with increase in income. These co-efficients, however, were not statistically significant. Though consistent signs had been realised in respect of these two variables, they were not statistically significant calling for further research.

When a family had sent out more migrants for outside work, the amount received from an individual member started to decline as shown by the statistically significant negative sign co-efficient for the variable. It decreased the amount remitted by 22 percent. The migrants who were married decreased their remittances to their families by about 29 percent, and the co-efficient was statistically significant.

When amount remitted function was corrected for selectivity bias incorporating the inverse of Mill's ratio drawn from Tobit function exploring

the probability of remittance, the co-efficient of the selectivity bias variable came up with an insignificant sign. It showed that sample selection bias did not exist in the sample of migrants found remitting. They did not have characteristics which differed from the rest of the migrants who were not found remitting. In effect, the migrant workers who were remitting did not differ significantly in terms of their characteristics from others.

The co-efficients of the regression incorporating the selectivity bias term did not substantively differ from the set of co-efficients derived without it. Both of them had almost same explanatory power around 25 percent and a similar F ratio. The same sub set of variables namely number of family members involved in migration and marital status and their co-efficients turned out statistically significant in both the estimations. Nevertheless, with the inclusion of selectivity bias variable in the equation, the co-efficient of the marital status variable improved by 15 percent and that of the number of family members involved in migration improved by three percent.

The concept of expected mean level of remittances was defined as the product of migrants' decision to remit and the actual amount remitted, following Knowles and Anker (1977). The elasticity measures of expected levels of remittances were calculated and are presented in Table XXI.

TABLE XXI
ELASTICITY MEASURES OF EXPECTED LEVELS OF REMITTANCES

S.No.	Variable	LPM based elasticity	Tobit based elasticity
1.	Income of worker	1.244	8.600
2.	Income squared	0.0565	4.380
3.	Number of family members involved in migration	0.000090	-0.016
4.	Marital status	0.3811**	-0.498**
5.	Number of school going children at the origin	0.3381**	-0.235**
6.	Return migration	0.1198**	0.0811**
7.	Possession of ancestral property	0.6195**	0.578**
8.	Migration period	0.5882*	0.680*
9.	Age	2.2439*	8.199
10.	Age squared	7.785*	1.890
11.	Number of dependents	0.3020**	0.2480**
12.	School going children at destination	0.3737**	0.2816**

Foot Note :

* - Variables statistically significant in LPM model

** - Variable statistically significant in both LPM and TOBIT models

A one percent increase in the probability of return migration raises the expected level of remittances by 0.08 percent. When the likelihood of possession of ancestral property increases by one percent, it increases the expected level of remittances by 0.57 percent. When there is possibility of improving the quality of assets in home area, the migrant tends to increase his remittances.

The presence of children and dependents have a very minor effect on the expected level of remittances and it has been ranging from 0.23 percent to 0.28 percent. If the age of the migrant worker increases by one percent, the expected level of remittances rises by 2.24 percent as indicated by LPM based elasticity measure. The elasticity measures of age and age squared have relatively high elasticity indicating that as workers get old, they tend to increase their level of remittances and the expected level of remittances increased at an increasing rate with age.

Knowles and Anker (1977) found that children and other dependents away had exhibited positive and high elasticity, whereas in the current study, children away and number of dependents had come up with positive but low elasticity. Marital status variable in the current study turned with negative elasticity similar to what Knowles and Anker (1977) found.

This analysis suggested that one can expect the level of remittances to go up if the dependents and number of children left behind

in the native place by the migrant rise. The setting up of family in the place of destination through marriage decreases the expected level of remittances. The study further revealed that the level of remittances assisted in asset acquisition as well as improving the productive quality of assets which the migrant perhaps hopes to inherit in due course.

CHAPTER V

SUMMARY AND CONCLUSION

V. SUMMARY AND CONCLUSION

People have been on the search for new opportunities towards a richer and more varied life. Migration has been going on since ancient days in search of such an endeavour. While we tend to think of migration largely in terms of international migration or in terms of rural to urban migration, the rural to rural migration on an individual level has been no less important. In internal migration which takes place for employment or for business seasons, 41.3 percent had been recorded at the inter-district level (Srivastava, 1998). Labour migration is not confined to labour deficit regions, it also takes place into labour surplus regions and employers use migrant labour as a labour control device. Brick manufacturing units constitute a leading employer of such migrant labour.

The issue of what causes them to migrate, how their labour supplies differ from that of local labour and what factors determine the flow of remittances of their income to the families in the home area are questions which have not been addressed as an integral part of their combined decision structure. In the received theory and research, these questions have been addressed but not jointly, and at the aggregate level and not at the individual level of specific categories of workers.

The current study on **“Labour Supply Functions and Remittance Behaviour Among Migrant Workers in a Seasonal Industry – Chamber Bricks Manufacturing Units in Rural Coimbatore”** aimed at contributing to the understanding on these issues. The specific objectives of the study were to

- ❖ identify the factors influencing their decision to migrate ;
- ❖ find out the determinants of their wage rates and the labour supplied by them in terms of their annual days of employment and
- ❖ examine their remittance behaviour as a two part problem – the first order decision involving the factors influencing their decision to remit and the second order decision involving the factors influencing the amount remitted by them to their family members in the home area.

The specific hypotheses tested in the study were :

- ◆ Migrant workers differ from non-migrant workers in that they are younger, single and unmarried, not very educated and come from landless or landpoor households and have relocated from areas where there was a large incidence of unemployment.
- ◆ The wage rates or earnings of workers in the brick manufacturing units are a function of their age and potential experience. Given other things, the migrant workers tend to have higher earnings than non-migrants as they bring with them the skills and ability to be trained which are to the advantage of the employer.
- ◆ The labour supply behaviour is a positive function of the wage rates for all the groups of worker in migrant male and female as well as non-migrant male and female workers.
- ◆ Health status is a determinant of labour supply function in so far as workers in the brick manufacturing units are exposed to hazardous conditions.

- ◆ The decision to remit and factors influencing the amount remitted are sequential decisions, with the set of factors influencing the first decision being different from the set of factors influencing the second decision.
- ◆ Workers remit more, when they have more binding ties with the home area in terms of their intention to go back, number of children and other dependents left behind by them and the fixed assets at the place of origin.

The study was conducted during the period April – August 2001, on a sample of 1050 workers, of whom 700 were migrant workers and 350 were local workers. These workers were selected from 50 chamber brick manufacturing units out of 500 units located in the study area, using cluster sampling procedure. Since the issues studied – the decision to migrate and the decision to remit were binary in character, in addition to the linear probability model, Logit and Tobit models involving the maximum likelihood estimation procedures were used to estimate the co-efficients. The wage and labour supply functions were estimated using two-stage least square model. The basic approach of the study was based on neo-classical household utility maximisation model.

The main findings that emerged out of the study were as follows :

Socio-economic Background of the Respondents

1. Of the total 1050 workers, 52 percent were males and 48 were females. Male workers were dominant in migrant group and female workers dominated in the non-migrant group.

2. Eighty eight percent of the migrants and 78 percent of the non-migrants were below the age of 40 years. The mean age of the migrant group and non-migrant group was 22 and 24 years respectively.
3. The married people were more in number among migrant (87 percent) as well as non-migrant (77 percent) workers.
4. The level of literacy was very poor with illiterate migrants accounting for one third share in the total and non-migrants taking a share of a little more than 50 percent of their total.
5. The nuclear family system was more predominant in the entire sample studied.
6. One-fifth of respondents reported cultivation as their parental occupation.
7. Except two migrant respondents, all the (698) respondents reported that they were working in some activity or the other, and they were mainly working as agricultural labourers, 83 percent of them were in landless and landpoor category.
8. Fifty six percent of the migrants only possessed some assets in the form of land and houses and the value of assets per worker ranged between Rs.40,000 to Rs.50,000.
9. The extent of employment ranged between 15 to 17 days per month and the wages earned by a worker per day were in the range of Rs.20-Rs.35.

10. Almost all the migrant workers were in distress, economically very poor and dissatisfied with previous job, which influenced their decision to out-migrant from their places of origin.

Factors Motivating Migration Behaviour

11. Majority (83 percent) of the migrants were found to have migrated within a period of 10 years.
12. Ninety three percent of the migrants migrated from their native places at the young age (15-35 years).
13. The Logit analysis carried out to estimate the migration status function indicated the following three important factors as most crucial determinants of migration decision - the low wages, landlessness and incidence of unemployment at the migrants' native places.
14. The workers in the brick industry were in the category of temporary workers, seasonal workers and permanent workers. Temporary workers were found moving from one unit to another, seasonal workers (84 percent) were heavily demanded during the peak season and sent back to their native place during off season.
15. Since the industry under was seasonal in nature, it offered employment for a period of eight to nine months during a year which was considered as full employment for them. The days

reported as not employed were due to their sickness and voluntarily remaining out from working.

16. The average monthly income of the migrant worker at the time of survey was Rs.1670 and that of non-migrant worker was Rs.1660 per month.
17. The mean household income of migrant group was below Rs.4000 per month ; none of the household among non-migrant group could earn above Rs.4000 per month.

Wage and Labour Supply Functions

The two stage least square method was adopted to obtain the wage equation in the first stage and the predicted wage was used as an instrumental variable in the second stage in labour supply equation. The wage equations were corrected for selectivity bias with the inverse of Mill's ratio derived from the migration status function as an additional regressor.

18. The variables used in the wage equation namely age, age squared / 10, education, experience, experience squared / 10 and sex and inverse of Mill's ratio could explain 53 to 78 percent of variation in wage rates for migrant, non-migrant and whole sample of workers ; 19 to 34 percent variations in the labour supply of these group were explained by a predicted wage, set of personal characteristics and set of variables proxied for reservation wages.

19. Wage co-efficient was positive with respect to labour supply of entire sample of 1050 workers and wages of male workers were higher than that of female workers by one-half ; the extent of variation being 46 percent in non-migrant group of workers and 52 percent in the case of migrant workers.
20. Age had a non-linear impact on the wages of all workers in general and migrant workers in particular.
21. The contribution made by the spouse and children working had impact on reducing the labour supplied of the particular group.
22. There was an inverse relationship between the wage rate and labour supply in respect of migrant worker.
23. Under the impact of spouse's and children income, the labour supply by the particular migrant worker was reduced.
24. Though migrant workers were lacking in health in terms of both indicators of short term as well as long term health status, they did not desist from work on grounds of ill health.
25. Among non-migrants, sickness in the short run did reduce the number of days of unemployment.
26. Children below 15 years did not emerge as a limiting factor on labour, reducing the labour supply of any group of workers.
27. Sex-wise estimates of wage and labour supply equation showed that non-linear effect of wage on the labour supply was confirmed only in respect of migrant labour workers.

28. The earnings of non-migrant male workers was not statistically explained by the chosen variables. The very poor explanatory power of the wage equation for the non-migrant male workers is perhaps derived from the near total reliance of the industry on the migrant worker.
29. Age had a negative influence on the labour supply of the non-migrant male workers.
30. The short term health status in terms of days of illness did reduce the quantum of labour supplied by the non-migrant male and female workers.
31. The reservation wages of male and female migrant workers were influenced by child income and it had no such influence on others.

Factors Influencing Remittance Behaviour

32. Out of 700 total migrant workers, one-third of them were found remitting a portion of their income to the families left behind at origin.
33. The mean income remitted per month was Rs.221, out of the mean earnings of Rs.1670 per month per person.
34. The results of Tobit analysis carried out on the decision to remit indicated that the probability of remitting did not depend on the individuals' income. The probability of remittances made by the worker was found positively related to a persons' intention of going back to his native place in the future.

35. The married migrants tended to make less remittances due to their family circumstances. The age of a person had a non-linear relationship with the probability of remittances.
36. The presence of school going children at the place of destination reduced the probability of remittances by the migrant worker.
37. The regression analysis done on factors influencing the amount of remittance made by respondents indicated that 25 percent of the changes in the amount of remittance were explained by the variables used in the analysis.
38. The workers earnings and earnings squared emerged with expected signs, making the average propensity to remit positive and marginal propensity to remit negative ; but the co-efficients were not statistically significant.
39. The married migrants decreased the amount remitted to their families by 29 percent and if the family consisted of more number of members who moved out, the amount remitted was found to decrease by 22 percent.
40. The remitting group did not have different characteristics from that of not remitting group, as the selectivity bias variable emerged insignificantly. The variables marital status and number of family members involved in migration turned out statistically significant in influencing remitting behaviour. The inclusion of selectivity bias variable had improved the marital status variable by 15 percent and that of family members involved in migration by three percent.

Conclusion

Rural to rural inter-district migration had taken place primarily due to opportunities of assured and regular employment for labourers at the place of destination. In the context of current study, the destination was brick manufacturing units located in the rural areas of Periyanaickenpalayam block in Coimbatore district and the places of origin of migrants were southern districts – Madurai, Theni, Dindugal, Kanyakumari, Trichy, Thanjavur, Nagapatnam, Periyar, Ramanathapuram, Tirunelveli, Dharmapuri and Salem. Labour being the only resource at the command of the workers they had migrated to take advantages of better and assured employment opportunities. The causes of migration were identified as poverty, unemployment, low income and indebtedness.

The migrant labourers were preferred over the local labourers by the industry for the very specific but unobservable characteristics that they possessed as against the local labourers which was very evident from the significant value of the selectivity bias variable in the wage equation. Segregation of tasks were observed between male and female labourers ; consequently the male wages were higher than the female wages by about half. These workers had full employment for 170 days in the peak season of eight months, during the months of January to August and who went back to their native places in the off season. Their labour supply functions exhibited a positive elasticity with respect to wages. They

continued to work inspite of their conditions of ill health. They did consider the opportunities of employment and earnings of spouses and children as offering them a respite from work. Since a good majority of these migrant workers were yet to marry, they did remit a part of their earnings to the families left behind by them. Among a third of migrants who reported remittance to their families, the amount remitted got reduced when they had brought some of the family members with them or as and when they got married. The industry appeared to depend largely on the migrant labour and the local labour was used only sparingly.

The current study focusing on the causes of migration of a specific group of worker population in the destination area had been formulated in the context of traditional utility maximisation model subject to budget and time constraints. Since the issues involved were categorical in nature, it attempted to estimate the functions explaining migration behaviour and remittance behaviour in limited dependent variable framework using maximum likelihood procedures in Logit and Tobit models. It checked for selectivity bias by finding out the inverse of Mill's ratio in appropriate context. The labour supply model was estimated in two-stage least squared (TSLS) frame work. Unlike most other migration studies which are based on aggregate data, the current study was based on individual data sets obtained through survey research.

Areas for Further Research

- The migrant workers who happen to be concentrated in other such activities and industries could also be studied to replicate and validate the findings of current research.
- Longitudinal studies on sets of migrant workers could be attempted to find out the public policy interventions that are necessary to promote their welfare.
- Studies on the impact of migration on the sending area in terms of levels of living of the families, capital formation, labour market outcomes could be attempted.
- Studies on the impact of migration workers on the local labour conditions could also be undertaken.

Policy Implications

Since migrant labour constitutes a big chunk of workers in industries like brick manufacturing units, the labour welfare department can focus on the requirements of these workers in terms of skill training, housing, provision of social security and other such needs. The government may pay attention to the kind of social infrastructure in terms of better schooling facilities and better facilities for medical care and so on. The issue of ration cards for them to benefit from public distribution system may also be taken care of.

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APPENDICES

APPENDIX – I

INTERVIEW SCHEDULE FOR MIGRATION WORKERS IN BRICK MANUFACTURING UNITS IN A SELECTED AREA

SECTION - I

General Information

1. Name
2.
 - a) Age :
 - b) Height (cms) :
 - c) Weight (kg) :
3. Native Place
 - Village :
 - Taluk :
 - District :
 - State :
 - Distance between native place
And the place you are working :
4. Place of residence (for the last five years)
 - Urban / Semi-urban / Rural :
 - Distance from work place :
5. Level of Education
 - Schooling :
 - Primary (Years) :
 - Secondary (Years) :
 - Higher Secondary :
 - Other (explain) :
6. Religion / Caste / Sub-caste

7. Marital Status

- a) Married
- b) Unmarried
- c) Married but separated / Divorced / Widow

8. Husband's / Spouse's

- a) Occupation (if married) :
- b) Age (at marriage) :
- c) Age (now) :

9. Husband's / Spouse's Education

- No schooling :
- Primary (Years) :
- Secondary (Years) :
- Higher Secondary (Years) :
- Others (Explain) :

10. Number of children (living)

0-5 years 5-10 years 10-15 years

Total

Male

Female

11. Other dependents of the family (if any) / (Please specify your relationship with them)

12. The parental family background of the worker.

Ancestral property

Land owned if any

Were the parents natives of the place ?

Parental education : Father / Mother

Parental Occupation : Father / Mother

SECTION - II

Pre-migration details

1. Were you working before you migrated to this place ?

Yes No

If yes,

- a) in own agricultural land
- b) as agricultural labourer
- c) as industrial worker
- d) self employed

2. If worked on own agricultural land, area and land holding

- a) Marginal land holding (1 –2 hectares)
- b) Small land holding (2 – 4 hectares)
- c) Medium land holding (4 – 10 hectares)
- d) Large size land holding (10 and above)

3. Family income - annual (gross in Rs.)

- a) Your income (gross in Rs.)
- b) Other sources of income (specify)

Cash	Kind	Items	1.
------	------	-------	----

2.

3.

4.

4. Does your family own the following items

- a) House
- b) Cattle
- c) Consumer durables (specify)
- d) Income earned from these assets (amount in Rs.)

5. How did you buy the land ?
 - a) Ancestral property
 - b) Bought with your own money
6. If worked as industrial / other type of worker
 - a) Nature of employment (explain)
 - b) Working hours
 - c) Mode of transport to work place
 - d) Duration of employment / week / month
 - e) Wage per hour / daily / monthly / others (specify)
7. If worked as casual labourer, nature of your employment.
Temporary / Permanent / Seasonal
 - a) Working hours
 - b) Mode of transport to work place
 - c) Duration of employment
 - d) Wages – daily / monthly / amount (in Rs.)
8. If self-employed,
 - a) Type of ability
 - b) Income from the business
9. For how many days, you were unemployed per month ?
10. Was your family in debt ?
 - a) Always
 - b) Sometimes
 - c) Rarely
11. State the reasons for borrowing.
12. Source of borrowing.
13. Amount borrowed (in Rs.)

14. Mode of repayment.
15. Were you satisfied with the earlier job ?
- Yes No
- a) Wages
 - b) Nature of work
 - c) Working hours
 - d) Distance from home
 - e) Any other reason (specify)

SECTION - III

Details on the present job

1. When did you migrate to this place ?
2. What was your age when you migrated to this place ?
3. Were you married when you migrated ?
4. Did you migrate alone / with your spouse / with your family members ?
5. How many in the family are working ?

Male : Female : Children :
6. Who helped you in getting information about this work ?
 - a) Parents
 - b) Prior migrants
 - c) Relatives / neighbours
 - d) Friends
 - e) Others

7. How long did you wait to get employment after reaching here ?
(specify)

(i) a) A few days b) Months c) Weeks

(ii) When did you start working in this particular unit ?

8. Reasons for migrating. (Rank them according to the order of importance)

Push factors

1. Level of poverty
2. Unemployment
3. Size of family
4. Family indebtedness
5. Low wages
6. Economic necessity
7. Lack of alternative employment in the off-season
8. Age
9. Small size of landholdings
10. Landlessness
11. Nature of jobs
12. Illiteracy
13. Under employment
14. Lack of opportunities for children's education
15. Marriage

Pull factors

1. Easy availability of job
2. Access to information sources
3. Assured job
4. Higher wages
5. Social infrastructural facilities
6. Better working conditions
7. Free residence
8. Accident insurance facility
9. Social security benefits
10. Better opportunities for children's education
11. Scholarships
12. Better access to health facilities
13. Alternative employment in the off-season and also in the event of closure
14. Opportunities for social mingling
15. Medical attention at the work spot

9. Nature of your current employment.

Temporary

Permanent

Seasonal

Working hours

Duration of employment / day / week

No. of days of absenteeism (voluntary)

No. of days of absenteeism (due to rains)

No. of days of illness

No. of days due to other personal reasons

Wages per hour / piece rate / weekly / monthly

Distance from residence

Any shifting from one unit to another

Mode of transport to work place

10. Current earnings of the family :

Current earnings of the worker :

11. How do you spend your income ?

- a) 100% contribution to the family.
- b) Hand it over to the head of the family.
- c) Spend it as you wish
- d) Spend it according to the wish of spouse / elders.
- e) Assets creation (mention) (Type of assets and value)
- f) Any other (explain)

12. Are there any savings in your name.

Yes No

If yes, mode of saving.

- | | <u>Mode of saving</u> | <u>Amount in Rs.</u> |
|----|-----------------------|----------------------|
| a) | Bank | |
| b) | Post office | |
| c) | Chit funds | |
| d) | Local chit funds | |
| e) | Relatives / friends | |
| f) | Any other | |

13. If no, do you have any debt ?

Reasons for borrowing :

Below Rs.1000	Rs.1000 – 2000
Rs.2000 – 4000	Rs.4000 – 6000
Rs.6000 – 10000	Rs.10000 and above

Source of borrowing :

Money lender	Relatives / friends
Employer	Bank
Others	

Interest per month :

14. a. If children are working, income earned per child per month ?

b. How many children are at school ? Standard
Male
Female

15. Do you visit your home town or village ? How often ? Do you send money to your family in the native place ?

Yes No

If yes, amount remitted.

16. Mention the reasons for remittance of money ?

- a) Consumption purpose
- b) Marriage
- c) To meet expenses on school going children
- d) Crop expenses
- e) House construction
- f) To buy agricultural land

- g) To make improvement on agricultural land
- h) To meet health expenses
- i) Intention of returning to the village
- j) Miscellaneous

17. Amount spent in each of the above mentioned reasons per year ?

18. Are you satisfied with your job ?

Yes No

If yes, mention in reasons.

19. If no, do you have any plans of going back to your place of origin?

20. Are you discriminated at the workspot and the type of discrimination ?

21. Do you possess a ration card ?

Do you use it ? or mortgaged it ?

APPENDIX - II

BACKGROUND INFORMATION FROM THE OWNERS OF BRICK CHAMBERS / BRICK KILN UNITS

1. Address :
2. Year of establishment :
3. Reasons for location of unit in the area :
4. Initial investment :
Current Net worth :
5. Average capacity of production (monthly) :
Actual production (monthly) :
6. Are there any seasonal demand ?
7. Number of labouers employed ? Male :
 Female :
 Children :
8. How many are
 - a) Local labour
 - b) Migrant labour
9. What particular problems do you face in respect of
 - Local labour
 - Migrant labour
10. Any discontinuance in production due to labour problems / rainy seasons.

11. Any competition faced from other units in terms of
 - a) Price
 - b) Quality
 - c) Demand
12. If there is increase in demand, how is it met ?
13. Any provisions for storing ?
14. Do you maintain / carry inventories ?
15. Reasons for preferring migrant workers as against local labour.
16. Total number of bricks per unit ?

APPENDIX - III

SUMMARY STATISTICS OF VARIABLES USED IN ESTIMATION OF WAGE EQUATION AND LABOUR SUPPLY EQUATION OF SAMPLE RESPONDENTS

APPENDIX – III.1

SUMMARY STATISTICS OF VARIABLES USED IN WAGE EQUATION OF SAMPLE RESPONDENTS

(N : 1050)

S.No.	Variable	Mean	Standard Deviation
1.	Log of wages / day	30.3152	8.3550
2.	Age	98.8753	57.3087
3.	Age squared / 10	0.0098	0.6182
4.	Marital status	0.3676	0.4824
5.	Education	21.8733	10.1088
6.	Experience	58.0532	48.7985
7.	Experience squared / 10	0.5200	0.4998
8.	Sex	4.2838	0.3285

APPENDIX - III.2

SUMMARY STATISTICS OF THE VARIABLES USED IN LABOUR SUPPLY EQUATION (N : 1050)

S.No.	Variable	Mean	Standard Deviation
1.	Number of days worked	30.3152	8.3550
2.	Age	0.4714	0.6705
3.	Children below 5 years	0.4371	0.6948
4.	Children between 5 and 10 years	0.1781	0.4976
5.	Children between 10 and 15 years	0.0733	0.3316
6.	Children above 15 years	0.4381	0.7098
7.	Family earnings	2924.6667	769.3083
8.	Children income	58.4771	288.1674
9.	Spouse income	1204.6229	779.0516
10.	Spouse occupation	0.7790	0.6103
11.	Marital status	0.1990	0.3995
12.	Return migration	0.9210	0.7490
13.	Illness days	643.3241	1052.4360
14.	Predicted wages	21.2149	3.3074
15.	Body mass index	174.4533	16.6681

APPENDIX - III.3

**SUMMARY STATISTICS OF THE VARIABLES USED IN ESTIMATION
OF MIGRANTS WAGE EQUATION**

S.No.	Variable	Mean	Standard Deviation
1.	Log of wages / day	29.4214	7.7370
2.	Age	92.5396	51.7052
3.	Age squared / 10	0.3440	0.4077
4.	Marital status	0.3357	0.4726
5.	Education	21.3443	9.6498
6.	Experience	54.8564	45.5059
7.	Experience squared / 10	0.5443	0.4984
8.	Sex	4.2996	0.3268

APPENDIX - III.4

SUMMARY STATISTICS OF VARIABLES USED IN ESTIMATION OF LABOUR SUPPLY EQUATION OF MIGRANT WORKERS

S.No.	Variable	Mean	Standard Deviation
1.	Age	29.4214	7.7370
2.	Below 5 years	0.5771	0.7125
3.	Between 5 to 10 years	0.4557	0.6720
4.	Between 10 to 15 years	0.1614	0.4675
5.	Above 15 years	0.0586	0.2944
6.	Dependent	0.4543	0.7465
7.	Family earning	2937.3714	789.317
8.	Children's income	61.0014	319.7039
9.	Spouse income	1206.0629	773.6110
10.	Spouse occupation	0.8314	0.3746
11.	Marital status	0.1600	0.3669
12.	Return	0.0900	0.2864
13.	Illness days	1.0129	0.7833
14.	Predicted wages	77.9408	27.5243
15.	Body mass index	20.8296	3.3355

APPENDIX - III.5

SUMMARY STATISTICS OF THE VARIABLES AND IN ESTIMATION OF WAGE EQUATION OF NON-MIGRANT WORKERS

S.No.	Variable	Mean	Standard Deviation
1.	Log of wages / day	32.1029	9.2260
2.	Age	111.5469	65.3881
3.	Age squared / 10	-0.6586	0.3792
4.	Marital status	0.4314	0.4960
5.	Education	22.9314	10.9068
6.	Experience	64.4469	54.3003
7.	Experience squared / 10	0.4714	0.4999
8.	Sex	4.2522	0.3301

APPENDIX - III.6

SUMMARY STATISTICS OF THE VARIABLES USED IN ESTIMATION OF LABOUR SUPPLY FUNCTION OF NON-MIGRANT WORKERS

S.No.	Variable	Mean	Standard Deviation
1.	Age	32.1029	9.2260
2.	Body Mass Index	21.9855	3.1149
3.	Dependents	0.4057	0.6297
4.	Children between 0-5 years	0.2600	0.5172
5.	Children between 5-10 years	0.4000	0.7378
6.	Children between 10-15 years	0.2114	0.5520
7.	Children more than 15 years	0.1029	0.3944
8.	Marital status	0.2771	0.4482
9.	Spouse occupation	0.6743	0.9066
10.	Illness days	0.7371	0.6375
11.	Predicted wage	74.0385	28.9401
12.	Family earnings	2899.2571	727.9161
13.	Children's Income	53.4286	211.7663
14.	Spouse Income	1201.7429	790.9279

APPENDIX - III.7

**SUMMARY STATISTICS OF THE VARIABLES USED IN ESTIMATION
OF WAGE EQUATION OF MIGRANT MALE WORKERS**

S.No.	Variable	Mean	Standard Deviation
1.	Log of wages / day	31.3255	7.5922
2.	Age	103.8774	52.0533
3.	Age squared / 10	0.3858	0.4874
4.	Education	22.7244	9.6486
5.	Experience	60.9249	45.5708
6.	Experience squared / 10	0.3350	0.3944
7.	Inverse of Mill's ratio	4.5555	0.1871

APPENDIX - III.8

SUMMARY STATISTICS OF THE VARIABLES USED IN ESTIMATION OF LABOUR SUPPLY EQUATION OF MIGRANT MALE WORKERS

S.No.	Variable	Mean	Standard Deviation
1.	Number of days worked	31.3255	7.5922
2.	Age	0.5774	0.7163
3.	Children below 5 years	0.4514	0.6695
4.	Children between 5-10 years	0.1837	0.4789
5.	Children between 10-15 years	0.0472	0.2468
6.	Children more than 15 years	0.4646	0.7657
7.	Dependents	2967.9265	688.4473
8.	Family earnings	52.2336	302.4918
9.	Children income	852.6877	505.1969
10.	Spouse income	0.8268	0.3789
11.	Spouse occupation	0.1339	0.3409
12.	Marital status	0.0866	0.2816
13.	Return migration	1.0052	0.7980
14.	Illness days	97.0438	22.2746
15.	Predicted wage	21.9115	3.2912
16.	Body mass index	21.3176	2.4390

APPENDIX - III.9

SUMMARY STATISTICS OF THE VARIABLES USED IN ESTIMATION OF WAGE EQUATION OF MIGRANT FEMALE WORKERS

S.No.	Variable	Mean	Standard Deviation
1.	Log of wages / day	27.1473	7.2918
2.	Age	78.9981	47.9658
3.	Age squared / 10	0.2759	0.4476
4.	Education	19.6959	9.4039
5.	Experience	47.6085	44.4230
6.	Experience squared / 10	0.3547	0.4234
7.	Inverse of Mill's ratio	3.9947	0.1446

APPENDIX - III.10

**SUMMARY STATISTICS OF THE VARIABLES USED IN THE
ESTIMATION OF LABOUR SUPPLY EQUATION OF MIGRANT
FEMALE WORKERS**

S.No.	Variable	Mean	Standard Deviation
1.	Number of days worked	27.1473	7.2918
2.	Age	0.5768	0.7090
3.	Children below 5 years	0.4608	0.6759
4.	Children between 5-10 years	0.1348	0.4528
5.	Children between 10-15 years	0.0721	0.3427
6.	Children more than 15 years	0.4420	0.7240
7.	Dependents	2900.8777	894.9354
8.	Family earnings	71.4734	339.3038
9.	Children income	1628.1191	825.9686
10.	Spouse income	0.8370	0.3700
11.	Spouse occupation	0.1912	0.3939
12.	Marital status	0.0940	0.2923
13.	Return migration	1.0219	0.7665
14.	Illness days	55.0675	12.1274
15.	Predicted wage	19.5375	2.9043
16.	Body mass index	21.8621	2.0527

APPENDIX - III.11

SUMMARY STATISTICS OF THE VARIABLES USED IN THE ESTIMATION OF WAGE EQUATION OF NON-MIGRANT MALE WORKERS

S.No.	Variable	Mean	Standard Deviation
1.	Log of wages / day	35.1515	9.4763
2.	Age	132.4885	72.5838
3.	Age squared / 10	-0.6492	0.4502
4.	Education	0.4788	0.5011
5.	Experience	25.2909	11.3686
6.	Experience squared / 10	76.8091	61.0867
7.	Inverse of Mill's ratio	4.4992	0.2537

APPENDIX - III.12

**SUMMARY STATISTICS OF VARIABLES USED IN THE ESTIMATION
OF LABOUR SUPPLY EQUATION OF NON-MIGRANT MALE
WORKERS**

S.No.	Variable	Mean	Standard Deviation
1.	Age	35.1515	9.4763
2.	Body mass index	23.0736	2.9421
3.	Dependents	0.4061	0.6038
4.	Children between 0-5 years	0.2727	0.5104
5.	Children between 5-10 years	0.3576	0.7067
6.	Children between 10-15 years	0.1879	0.5248
7.	Children more than 15 years	0.1333	0.4754
8.	Marital status	0.2424	0.4299
9.	Spouse occupation	0.5818	0.4948
10.	Illness days	0.7455	0.6501
11.	Predicted wage	91.7459	24.2417
12.	Family earnings	3083.5152	590.8270
13.	Children income	67.8788	241.6881
14.	Spouse income	936.3030	655.1394

APPENDIX - III.13

SUMMARY STATISTICS OF THE VARIABLES USED IN THE ESTIMATION OF WAGE EQUATION OF NON-MIGRANT FEMALE WORKERS

S.No.	Variable	Mean	Standard Deviation
1.	Log of wages / day	29.3838	8.1018
2.	Age	92.8692	51.6715
3.	Age Squared / 10	-0.6671	0.3031
4.	Inverse of Mill's ratio	0.3892	0.4889
5.	Education	20.8270	10.0495
6.	Experience	53.4211	44.8033
7.	Experience squared / 10	4.0319	0.2140

APPENDIX - III.14

**SUMMARY STATISTICS OF THE VARIABLES USED IN THE
ESTIMATION OF LABOUR SUPPLY EQUATION OF NON-MIGRANT
FEMALE WORKERS**

S.No.	Variable	Mean	Standard Deviation
1.	Age	29.3838	8.1018
2.	Body mass index	21.0150	2.9460
3.	Dependents	0.4054	0.6536
4.	Children between 0-5 years	0.2486	0.5242
5.	Children between 5-10 years	0.4378	0.7645
6.	Children between 10-15 years	0.2324	0.5758
7.	Children more than 15 years	0.0757	0.3034
8.	Marital status	0.3081	0.4630
9.	Spouse occupation	0.7568	1.1517
10.	Illness days	0.7297	0.6277
11.	Predicted wage	57.3354	14.3021
12.	Family earnings	2734.9189	797.6699
13.	Children income	40.5405	180.6682
14.	Spouse income	1438.4865	827.3135

APPENDIX - IV

CORRELATION MATRIX INVOLVING THE VARIABLES USED IN ESTIMATION OF WAGE FUNCTION AND LABOUR SUPPLY FUNCTION OF SAMPLE RESPONDENTS

APPENDIX - IV.1

CORRELATION MATRIX INVOLVING THE VARIABLES USED IN WAGE FUNCTION OF SAMPLE RESPONDENTS (N : 1050)

Variable	X ₁	X ₂	X ₃	X ₄	X ₄	X ₄	X ₆	X ₇	X ₈
X ₁	1.00000								
X ₂	0.35999	1.00000							
X ₃	0.33184	0.98588	1.00000						
X ₄	0.07065	-0.05743	-0.02731	1.00000					
X ₅	0.02517	-0.14397	-0.11602	-0.01206	1.00000				
X ₆	0.27792	0.89095	0.86583	-0.03213	-0.55991	1.00000			
X ₇	0.26761	0.90692	0.91723	-0.00419	-0.45772	0.95992	1.00000		
X ₈	0.80712	0.27002	0.24800	0.04687	0.09995	0.16757	0.16371	1.00000	

X₁ - Log of wages / day X₂ - Age X₃ - Age squared / 10 X₄ - Inverse of Mill's ratio

X₅ - Education X₆ - Experience X₇ - Experience squared / 10 X₈ - Sex

APPENDIX - IV.2

CORRELATION MATRIX USING VARIABLES USED IN ESTIMATION OF WAGE EQUATION OF MIGRANT WORKERS

Variable	X ₁	X ₂	X ₃	X ₄	X ₄	X ₆	X ₇	X ₈
X ₁	1.00000							
X ₂	0.43288	1.00000						
X ₃	0.39402	0.98539	1.00000					
X ₄	-0.03467	0.01470	0.05989	1.000000				
X ₅	0.01298	-0.20504	-0.17738	0.07248	1.00000			
X ₆	0.33620	0.89490	0.86924	-0.01631	-0.61328	1.00000		
X ₇	0.32000	0.91482	0.92571	0.03239	-0.49958	0.96018	1.00000	
X ₈	0.85605	0.26914	0.23981	-0.02404	0.11597	0.15641	0.14585	1.00000

X₁ - Log of wages / day X₂ - Age X₃ - Age squared / 10 X₄ - Inverse of Mill's ratio

X₅ - Education X₆ - Experience X₇ - Experience squared / 10 X₈ - Sex

APPENDIX - IV.3

CORRELATION MATRIX INVOLVING THE VARIABLES USED IN ESTIMATION OF WAGE EQUATION OF NON-MIGRANT WORKERS

Variable	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈
X ₁	1.00000							
X ₂	0.31255	1.00000						
X ₃	0.31495	0.98674	1.00000					
X ₄	0.18452	0.23241	0.29462	1.00000				
X ₅	0.08834	-0.09050	-0.06710	0.13496	1.00000			
X ₆	0.21094	0.88958	0.86772	0.14241	-0.50036	1.00000		
X ₇	0.23359	0.89648	0.90850	0.23534	-0.42629	0.96011	1.00000	
X ₈	0.72034	0.31252	0.30289	0.02359	0.09031	0.20460	0.21531	1.00000

X₁ - Log of wages / day

X₂ - Age

X₃ - Age squared / 10

X₄ - Inverse of Mill's ratio

X₅ - Education

X₆ - Experience

X₇ - Experience squared / 10

X₈ - Sex

APPENDIX - IV.4

CORRELATION MATRIX INVOLVING IN THE VARIABLES USED IN ESTIMATION OF WAGE EQUATION OF MIGRANT MALE WORKERS

Variable	X ₁	X ₂	X ₃	X ₄	X ₄	X ₆	X ₇
X ₁	1.00000						
X ₂	0.42774	1.00000					
X ₃	0.38972	0.98712	1.00000				
X ₄	-0.15987	-0.19189	-0.15810	1.00000			
X ₅	0.41822	0.88309	0.85466	-0.62250	1.00000		
X ₆	0.40116	0.89875	0.89992	-0.54025	0.96764	1.00000	
X ₇	-0.06466	0.07297	0.10495	0.06453	0.03162	0.04971	1.00000

X₁ - Log of wages / day X₂ - Age X₃ - Age squared / 10 X₄ - Inverse of Mill's ratio

X₅ - Education X₆ - Experience X₇ - Experience squared / 10

APPENDIX - IV.5

CORRELATION MATRIX INVOLVING IN THE VARIABLES USED IN ESTIMATION OF WAGE EQUATION OF MIGRANT FEMALE WORKERS

Variable	X ₁	X ₂	X ₃	X ₄	X ₄	X ₆	X ₇
X ₁	1.00000						
X ₂	0.37885	1.00000					
X ₃	0.35690	0.98230	1.00000				
X ₄	-0.18347	-0.32174	-0.29003	1.00000			
X ₅	0.36796	0.91368	0.88514	-0.67249	1.00000		
X ₆	0.35694	0.94476	0.96486	-0.50664	0.94883	1.00000	
X ₇	0.02574	-0.03703	0.02303	0.08997	-0.06336	0.02106	1.00000

X₁ - Log of wages / day X₂ - Age X₃ - Age squared / 10 X₄ - Inverse of Mill's ratio

X₅ - Education X₆ - Experience X₇ - Experience squared / 10

APPENDIX - IV.6

CORRELATION MATRIX INVOLVING IN THE VARIABLES USED IN ESTIMATION OF WAGE EQUATION OF NON-MIGRANT MALE WORKERS

Variable	X ₁	X ₂	X ₃	X ₄	X ₄	X ₆	X ₇
X ₁	1.00000						
X ₂	0.10425	1.00000					
X ₃	0.10852	0.98852	1.00000				
X ₄	0.17332	0.38162	0.41218	1.00000			
X ₅	0.02377	-0.07316	-0.05033	0.11783	1.00000		
X ₆	0.06598	0.88118	0.85987	0.27728	-0.47631	1.00000	
X ₇	0.07303	0.88765	0.89970	0.34107	-0.42504	0.95791	1.00000

X₁ - Log of wages / day X₂ - Age X₃ - Age squared / 10 X₄ - Inverse of Mill's ratio
X₅ - Education X₆ - Experience X₇ - Experience squared / 10

APPENDIX - IV.7

CORRELATION MATRIX INVOLVING IN THE VARIABLES USED IN ESTIMATION OF WAGE EQUATION OF NON-MIGRATION FEMALE WORKERS

Variable	X ₁	X ₂	X ₃	X ₄	X ₄	X ₆	X ₇
X ₁	1.00000						
X ₂	0.07814	1.00000					
X ₃	0.08243	0.99068	1.00000				
X ₄	0.26795	0.01706	0.09661	1.00000			
X ₅	-0.01579	-0.18199	-0.16542	0.15987	1.00000		
X ₆	0.07952	0.89621	0.88109	-0.06102	-0.59131	1.00000	
X ₇	0.08000	0.90889	0.91728	0.04648	-0.51014	0.96859	1.00000

X₁ - Log of wages / day X₂ - Age X₃ - Age squared / 10 X₄ - Inverse of Mill's ratio

X₅ - Education X₆ - Experience X₇ - Experience squared / 10

APPENDIX - IV.8

CORRELATION MATRIX INVOLVING THE VARIABLES USED IN ESTIMATION OF LABOUR SUPPLY FUNCTION – ALL WORKERS

Variable	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	X ₁₂	X ₁₃	X ₁₄	X ₁₅
X ₁	1.00000														
X ₂	0.02995	1.00000													
X ₃	-0.09778	-0.18327	1.00000												
X ₄	0.02420	0.23850	-0.17472	1.00000											
X ₅	0.02497	0.43823	-0.23189	-0.07651	1.00000										
X ₆	0.06745	0.46716	-0.15563	-0.1314	-0.08832	1.00000									
X ₇	-0.07611	-0.04340	0.05236	-0.06783	-0.4298	-0.04347	1.00000								
X ₈	0.26708	0.34599	0.15307	0.21236	0.11416	0.21113	0.01352	1.00000							
X ₉	0.06076	0.38021	-0.12801	-0.11065	0.10283	0.8396	-0.02656	0.26232	1.00000						
X ₁₀	0.07997	-0.05499	0.21638	0.19223	-0.01209	-0.15032	0.03531	0.65230	-0.14824	1.00000					
X ₁₁	-0.06061	0.19800	0.19887	0.27297	0.07948	0.00006	0.13564	0.39608	0.01229	0.37711	1.00000				
X ₁₂	0.06117	-0.36528	-0.30083	-0.28633	-0.12097	-0.03114	-0.01870	-0.58681	-0.05401	-0.46197	-0.57407	1.00000			
X ₁₃	-0.03547	0.01023	0.07617	0.04082	0.00200	0.02720	0.02037	0.03648	0.04132	0.01544	0.01389	-0.04295	1.00000		
X ₁₄	0.15415	0.25051	-0.14363	0.055170	0.07024	-0.00619	0.00730	0.07324	-0.03487	-0.00433	-0.04365	-0.01824	-0.12978	1.00000	
X ₁₅	-0.14876	0.33435	-0.00481	0.06347	0.12835	0.06446	0.09326	0.07831	0.05930	-0.11730	0.06684	-0.14416	0.05581	0.22197	1.00000

X₁ - Number of days worked

X₂ - Age

X₃ - Children below 5 years

X₄ - Children between 5 to 10 years

X₅ - Children between 10 to 15 years

X₆ - Children above 15 years

X₇ - Family earnings

X₈ - Children income

X₉ - Spouse income

X₁₀ - Spouse occupation

X₁₁ - Marital status

X₁₂ - Return migration

X₁₃ - Illness days

X₁₄ - Predicted wage

X₁₅ - Body mass index

APPENDIX - IV.9

CORRELATION MATRIX INVOLVING THE VARIABLES USED IN ESTIMATION OF LABOUR SUPPLY EQUATION OF

MIGRANT WORKERS

Variable	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	X ₁₂	X ₁₃	X ₁₄	X ₁₅	X ₁₆
X ₁	1.00000															
X ₂	-0.04626	1.00000														
X ₃	-0.04792	-0.18095	1.00000													
X ₄	0.01913	0.27395	-0.17961	1.00000												
X ₅	0.02822	0.45146	-0.25005	-0.01592	1.00000											
X ₆	0.05060	0.40865	-0.16137	-0.12787	0.15987	1.00000										
X ₇	-0.06028	-0.04335	-0.00412	-0.10814	-0.03417	-0.01058	1.00000									
X ₈	0.33792	0.36667	0.14352	0.17576	0.15405	0.33249	-0.05915	1.00000								
X ₉	0.05470	0.38173	-0.13594	-0.11625	0.13409	0.94225	-0.00838	0.35324	1.00000							
X ₁₀	0.15473	-0.07930	0.21883	0.15594	-0.03266	-0.08717	-0.03666	0.64026	-0.09914	1.00000						
X ₁₁	-0.02213	0.31031	0.31141	0.26012	0.12292	0.03776	-0.09409	0.59254	0.03820	0.53399	1.00000					
X ₁₂	0.03521	-0.38315	-0.27716	-0.24977	-0.13413	-0.08688	0.09988	-0.57005	-0.08333	-0.43082	-0.82354	1.00000				
X ₁₃	0.05324	0.03128	-0.05160	-0.02015	0.06230	-0.01171	0.16314	0.07040	-0.01317	0.03376	-0.01840	0.01253	1.00000			
X ₁₄	0.06625	0.03357	-0.01332	-0.06767	0.00214	0.02774	0.02670	0.04047	0.03172	0.01078	0.02690	-0.00717	-0.01154	1.00000		
X ₁₅	-0.07032	0.48572	-0.00138	0.21825	0.17149	-0.01990	-0.00433	0.19952	-0.02227	-0.29566	0.19839	-0.28306	0.01156	0.03464	1.00000	
X ₁₆	-0.24086	0.29374	0.00732	0.06341	0.13330	0.04988	0.09679	0.01628	0.04661	-0.18142	0.05897	-0.10773	0.01978	0.11968	0.35692	1.00000

X₁ - Number of days worked

X₂ - Age

X₃ - Children below 5 years

X₄ - Children between 5 to 10 years

X₅ - Children between 10 to 15 years

X₆ - Children above 15 years

X₇ - Family earnings

X₈ - Children income

X₉ - Spouse income

X₁₀ - Spouse occupation

X₁₁ - Marital status

X₁₂ - Return migration

X₁₃ - Illness days

X₁₄ - Predicted wage

X₁₅ - Body mass index

APPENDIX - IV.10

CORRELATION MATRIX INVOLVING THE VARIABLES USED IN ESTIMATION OF LABOUR SUPPLY EQUATION OF NON-MIGRANT WORKERS

Variable	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	X ₁₂	X ₁₃	X ₁₄	X ₁₅
X ₁	1.00000														
X ₂	0.13850	1.00000													
X ₃	0.00820	0.36592	1.00000												
X ₄	-0.11560	-0.03186	0.10855	1.00000											
X ₅	-0.13069	-0.10891	0.11063	0.21187	1.00000										
X ₆	0.06651	0.20692	0.08560	0.01357	-0.22077	1.00000									
X ₇	-0.00817	0.41542	0.10462	-0.05789	-0.19311	-0.16602	1.00000								
X ₈	0.08559	0.53487	0.07964	-0.09928	-0.13148	-0.14177	-0.00805	1.00000							
X ₉	0.05563	-0.41017	-0.28577	-0.23709	-0.31174	-0.33616	-0.12169	0.01658	1.00000						
X ₁₀	-0.08690	0.18112	0.13433	0.39274	0.09558	0.31525	0.06929	-0.01021	-0.44707	1.00000					
X ₁₁	-0.28401	0.04748	0.00117	-0.01909	0.21660	-0.03777	0.02810	0.06225	-0.04516	-0.04445	1.00000				
X ₁₂	0.17587	0.38573	0.35580	0.09581	0.11039	0.19632	0.08890	-0.13529	-0.32101	0.07587	-0.00849	1.00000			
X ₁₃	0.07714	0.33764	0.23928	0.19801	0.17954	0.28491	0.04667	0.02871	-0.63879	0.30911	0.01298	0.31514	1.00000		
X ₁₄	0.10503	0.44727	0.11547	-0.09426	-0.12721	-0.10783	0.03790	0.73673	0.01562	-0.01805	0.07037	-0.09100	-0.02564	1.00000	
X ₁₅	-0.13173	-0.1609	0.01319	0.20270	0.23776	0.25742	0.02225	-0.24627	-0.52720	0.31866	0.02620	-0.04635	0.68063	-0.30416	1.00000

X₁ - Number of days worked

X₂ - Age

X₃ - Children below 5 years

X₄ - Children between 5 to 10 years

X₅ - Children between 10 to 15 years

X₆ - Children above 15 years

X₇ - Family earnings

X₈ - Children income

X₉ - Spouse income

X₁₀ - Spouse occupation

X₁₁ - Marital status

X₁₂ - Return migration

X₁₃ - Illness days

X₁₄ - Predicted wage

X₁₅ - Body mass index

APPENDIX - IV.11

CORRELATION MATRIX INVOLVING VARIABLES USED IN THE ESTIMATION OF LABOUR SUPPLY EQUATION OF MALE MIGRANT WORKERS

Variable	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	X ₁₂	X ₁₃	X ₁₄	X ₁₅	X ₁₆
X ₁	1.00000															
X ₂	-0.03388	1.00000														
X ₃	-0.12784	-0.19579	1.00000													
X ₄	0.05701	0.30079	-0.11149	1.00000												
X ₅	0.00849	0.50684	-0.28709	-0.03776	1.00000											
X ₆	0.07555	0.34988	-0.15471	-0.11347	0.21581	1.00000										
X ₇	-0.03412	-0.04600	-0.07776	-0.15351	-0.02526	-0.04682	1.00000									
X ₈	0.37961	0.42181	0.05286	0.23103	0.20710	0.38837	-0.11334	1.00000								
X ₉	0.07483	0.30817	-0.12742	-0.09072	0.14978	0.91501	-0.04824	0.42622	1.00000							
X ₁₀	0.03506	0.06780	0.18732	0.19703	-0.02240	-0.16775	-0.10420	0.58456	-0.16460	1.00000						
X ₁₁	-0.11400	0.34437	0.28223	0.27792	0.13235	-0.02481	-0.14819	0.46354	-0.01269	0.52844	1.00000					
X ₁₂	0.12596	-0.44792	-0.27423	-0.26541	-0.15103	-0.07535	0.16439	-0.45702	-0.06797	-0.43355	-0.77736	1.00000				
X ₁₃	0.08244	0.01509	-0.13117	-0.05439	-0.00123	-0.05902	0.20342	0.08060	-0.05324	0.05440	-0.03165	0.04337	1.00000			
X ₁₄	0.08162	0.07095	0.00849	0.01033	0.01813	0.05218	0.02184	0.04265	0.06319	-0.02752	0.02912	0.00708	-0.02545	1.00000		
X ₁₅	-0.11703	0.13319	0.06811	-0.33334	0.12454	0.02550	0.01247	0.03712	0.00714	0.06432	0.13747	-0.13309	0.00638	0.02889	1.00000	
X ₁₆	-0.29470	0.15885	0.11275	-0.00629	0.04698	0.02634	0.10809	-0.03003	0.03801	0.01103	0.05487	-0.10798	0.04299	0.07773	0.09574	1.00000

X₁ - Number of days worked

X₂ - Age

X₃ - Children below 5 years

X₄ - Children between 5 to 10 years

X₅ - Children between 10 to 15 years

X₆ - Children above 15 years

X₇ - Family earnings

X₈ - Children income

X₉ - Spouse income

X₁₀ - Spouse occupation

X₁₁ - Marital status

X₁₂ - Return migration

X₁₃ - Illness days

X₁₄ - Predicted wage

X₁₅ - Body mass index

APPENDIX - IV.12

CORRELATION MATRIX INVOLVING THE VARIABLES USED IN THE ESTIMATION OF LABOUR SUPPLY EQUATION OF MIGRANT FEMALE WORKERS

Variable	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	X ₁₂	X ₁₃	X ₁₄	X ₁₅	X ₁₆
X ₁	1.00000															
X ₂	0.01292	1.00000														
X ₃	0.06564	-0.17828	1.00000													
X ₄	-0.03564	0.26885	-0.26111	1.00000												
X ₅	0.07420	0.38635	-0.20375	0.01218	1.00000											
X ₆	0.01865	0.52808	-0.17170	-0.14391	0.11956	1.00000										
X ₇	-0.09639	-0.05348	0.08987	-0.05125	-0.04802	0.02325	1.00000									
X ₈	0.32579	0.32717	0.23049	0.12899	0.10260	0.29973	-0.00934	1.00000								
X ₉	0.02323	0.51481	-0.14576	-0.14407	0.12130	0.97246	0.03741	0.29836	1.00000							
X ₁₀	0.18831	0.06888	0.31485	0.16942	0.00329	-0.10307	0.01870	0.87242	-0.11413	1.00000						
X ₁₁	0.10695	0.30269	0.34758	0.23848	0.11281	0.09300	-0.02367	0.72808	0.09311	0.70352	1.00000					
X ₁₂	-0.09562	-0.30437	-0.28358	-0.23755	-0.10971	-0.10247	0.03350	-0.65983	-0.10259	-0.62650	-0.88601	1.00000				
X ₁₃	0.01120	0.01634	0.04090	0.01871	0.14149	0.02627	0.11499	0.06339	0.02713	0.01675	-0.00319	-0.02012	1.00000			
X ₁₄	0.04190	-0.00508	-0.04072	0.13824	-0.01761	0.00593	0.03347	0.04027	-0.00363	0.03245	0.02374	-0.02436	0.00479	1.00000		
X ₁₅	-0.04873	-0.06492	-0.07069	0.00372	0.00964	-0.06526	0.02571	-0.03572	-0.06327	-0.2378	-0.05788	0.07915	0.04071	0.01477	1.00000	
X ₁₆	-0.08452	0.30712	-0.13606	0.17378	0.23320	0.09537	0.08323	0.03410	0.09029	-0.01909	0.08698	-0.06176	0.00418	0.20889	0.10198	1.00000

X₁ - Number of days worked

X₂ - Age

X₃ - Children below 5 years

X₄ - Children between 5 to 10 years

X₅ - Children between 10 to 15 years

X₆ - Children above 15 years

X₇ - Family earnings

X₈ - Children income

X₉ - Spouse income

X₁₀ - Spouse occupation

X₁₁ - Marital status

X₁₂ - Return migration

X₁₃ - Illness days

X₁₄ - Predicted wage

X₁₅ - Body mass index

APPENDIX - IV.13

CORRELATION MATRIX INVOLVING THE VARIABLES USED IN THE ESTIMATION OF LABOUR SUPPLY EQUATION OF NON-MIGRANT FEMALE WORKERS

Variable	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	X ₁₂	X ₁₃	X ₁₄	X ₁₅
X ₁	1.00000														
X ₂	0.05315	1.00000													
X ₃	-0.05378	0.40963	1.00000												
X ₄	-0.20002	-0.07060	0.12257	1.00000											
X ₅	-0.22397	-0.17999	0.11402	0.27525	1.00000										
X ₆	0.05351	0.23509	0.19436	-0.03087	-0.20533	1.00000									
X ₇	-0.00087	0.55745	0.14917	-0.15066	-0.19251	-0.23245	1.00000								
X ₈	0.12431	0.47007	0.14176	-0.10073	-0.11894	-0.14362	0.08542	1.00000							
X ₉	0.18026	-0.34467	-0.26440	-0.34321	-0.31739	-0.38323	-0.06623	0.02656	1.00000						
X ₁₀	-0.11101	0.12830	0.19351	0.49274	0.10073	0.29446	-0.01263	-0.02480	-0.43967	1.00000					
X ₁₁	-0.38057	-0.03614	-0.03228	0.01683	0.27143	-0.08051	0.00935	-0.3471	-0.02982	-0.06137	1.00000				
X ₁₂	0.05171	-0.02357	-0.00273	0.06510	0.02289	-0.00929	-0.08606	0.09050	0.09900	-0.07286	-0.02521	1.00000			
X ₁₃	0.04244	0.24734	0.15468	0.27033	0.23881	0.33129	0.02755	-0.03411	-0.73673	0.35934	-0.07028	-0.07385	1.00000		
X ₁₄	0.12253	0.38548	0.16352	-0.06630	-0.10701	-0.09773	0.04998	0.75667	0.07727	-0.04377	-0.01788	0.09572	-0.11686	1.00000	
X ₁₅	-0.14828	0.15185	0.13398	0.29414	0.30840	0.29244	0.01808	-0.18140	-0.74060	0.34339	0.01543	-0.14132	0.91659	-0.29571	1.00000

X₁ - Number of days worked

X₂ - Age

X₃ - Children below 5 years

X₄ - Children between 5 to 10 years

X₅ - Children between 10 to 15 years

X₆ - Children above 15 years

X₇ - Family earnings

X₈ - Children income

X₉ - Spouse income

X₁₀ - Spouse occupation

X₁₁ - Marital status

X₁₂ - Return migration

X₁₃ - Illness days

X₁₄ - Predicted wage

X₁₅ - Body mass index

APPENDIX - IV.14

CORRELATION MATRIX INVOLVING THE VARIABLES USED IN THE ESTIMATION OF LABOUR SUPPLY EQUATION OF NON-MIGRANT MALE WORKERS

Variable	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	X ₁₂	X ₁₃	X ₁₄	X ₁₅
X ₁	1.00000														
X ₂	0.09006	1.00000													
X ₃	-0.10377	0.18272	1.00000												
X ₄	-0.00930	0.00410	0.10561	1.00000											
X ₅	-0.03254	-0.06658	0.10344	0.13309	1.00000										
X ₆	0.11998	0.24043	0.00742	0.07205	-0.23820	1.00000									
X ₇	0.00443	0.34610	0.09566	0.06565	-0.19244	-0.08359	1.00000								
X ₈	0.03250	0.59237	0.00210	-0.10479	-0.15077	0.14277	-0.07657	1.00000							
X ₉	-0.06661	-0.48060	-0.29459	-0.09966	-0.30317	0.28710	-0.20311	0.01989	1.00000						
X ₁₀	0.05028	0.51560	0.18013	0.20448	0.11634	0.43028	0.30441	0.03111	-0.60990	1.00000					
X ₁₁	-0.19370	0.12210	0.02860	-0.06129	0.15536	0.01351	0.05166	0.13021	-0.06149	-0.01069	1.00000				
X ₁₂	-0.0539	0.05781	0.01933	-0.01285	-0.03287	0.16101	-0.09176	0.01202	0.06333	0.07175	-0.07328	1.00000			
X ₁₃	-0.01224	0.35043	0.21002	0.09784	0.09062	0.27269	0.10955	0.05737	-0.49652	0.32900	0.12855	0.00986	1.00000		
X ₁₄	0.06825	0.49893	0.04854	-0.12317	-0.15098	-0.11441	0.03344	0.72738	-0.03024	0.04506	0.14169	-0.01650	0.03795	1.00000	
X ₁₅	0.07458	0.02392	0.13102	0.9245	0.18939	0.19595	-0.00258	-0.31145	0.34453	0.22357	0.05476	0.06023	0.64159	-0.32539	1.00000

X₁ - Number of days worked

X₂ - Age

X₃ - Children below 5 years

X₄ - Children between 5 to 10 years

X₅ - Children between 10 to 15 years

X₆ - Children above 15 years

X₇ - Family earnings

X₈ - Children income

X₉ - Spouse income

X₁₀ - Spouse occupation

X₁₁ - Marital status

X₁₂ - Return migration

X₁₃ - Illness days

X₁₄ - Predicted wage

X₁₅ - Body mass index