Vulnerability and rural labour households in India

A thesis submitted for the degree of

M.Phil. in Economics at Oxford University

by

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April 1984

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Preface

This study on (the problem of) vulnerability of poor labour households in rural areas attempts to investigate the factors determining ability to respond to risks and crises, through adjustments both within the household, and externally, be it via markets or social exchange. The importance of security in the life of the poor is of concern here and was motivated by the description of the very same in the words of Amartya Sen:*

> "The phase of economic development after the emergence of a large class of wage labourers but before the development of social security arrangements is potentially a deeply vulnerable one."

The attempt is to identify and define different risks, the vulnerability associated with them, in order to see how policies might differ from the more general case of poverty reduction.

My greatest debt is to Judith Heyer for constant encouragement and extensive criticism. I have benefited greatly from discussions with Peter Sinclair and Amartya Sen. I am particularly grateful to ICRISAT for being generous with their data, and especially to N.S. Jodha for providing help and valuable insights. I am also thankful to Gopu Kumar, P. Seabright and H.V. Singh for useful suggestions.

* page 173, Poverty and Famines: An essay on entitlement and deprivation, Clarendon Press, Oxford. 1981.

Chapter One begins by introducing the concept of vulnerability, with its emphasis on the instability and insecurity of those in poverty. A framework for analysis of this concept is provided and illustrated with the case of rural labour households. Some measures and indicators for vulnerability which may be useful in the identification of a target-group are outlined. The lack of adequate insurance and security provision establishes the case for studying this problem. The second chapter focusses on responses to risk through intra household adjustments, bringing out different characteristics of households and their effect on ability to adjust to shocks. The role of market forces is brought out in Chapter Three, with a detailed investigation of rural credit and labour markets, their features, how they may act as sources of risk as well as provide adjustment mechanisms to lower risk. Different theories are analysed, namely the neoclassical theory, security based approach, bargaining approach, and finally the entitlement approach to find the one suitable for discussing vulnerability. An empirical illustration of the problem is provided in Chapter Four, based on two village studies in India. Using available evidence, some aspects of vulnerability are presented e.g. the extent of variability in incomes, and asset values and the possible importance of differences in household structure. The concluding chapter brings together some thoughts on changes in emphasis and hence implications for policy from the preceding analysis.

CHAPTER ONE

A Conceptual Discussion: Vulnerability

'Between the mortar and the pestle, the chilli cannot last'

- a Bengali proverb

'We poor are like chillies - each year we are ground down, and soon there will be nothing left'

- a landless labourer in Bangladesh[1]

The focus in this thesis is on vulnerability, or the susceptibility of those in poverty to fluctuations. Poor people, who are in a deeply insecure position to begin with, suffer losses from even minor fluctuations in income. Tawney[2] brings out the precariousness of the situation well, writing of China several decades ago, "There are districts in which the position of the rural population is that of a man standing permanently up to the neck in water, so that even a ripple is sufficient to drown him."

1.1 Introduction

The focus in this thesis is on the insecurity which may arise from poverty. The usual discussion ignores the question of instability. The concept of 'vulnerability' is introduced, to analyse the effect of shocks on a (poor) household's position. It is important to distinguish vulnerability from risk, as some people especially those with a high level of income may face risks but be able to insure against them adequately. There may be some among the rich who are insecure, but the problem of insecurity among the poor is

more pressing and requires greater attention than has been given to it.

In the Indian context, vulnerability has often been discussed in terms of risk from extreme natural phenomena. This confuses the issue as natural disasters are only some of the external shocks, from which a household will suffer if it is in a vulnerable state. The Chambers dictionary (1977) defines vulnerability as the "state or capacity for being liable to injury or damage, likewise it reflects the capacity to withstand injury or damage."

Let us consider the following as a working definition: a household can be said to be vulnerable if it is liable to unfavourable shocks and has a high probability of not recovering from the shock quickly and/or fully (i.e. without permanent loss).[3] If p = probability of bad shock, q = probability of slow/incomplete recovery then vulnerability is given by pq.

It is possible to introduce a vector of variables in relation to this concept. For example, one can be vulnerable to illness, disease, starvation, death. Vulnerability to poverty defined as an income shortfall can be the cause for any of these. Poverty is the predicament in which a household finds itself at a given point in time while vulnerability gives the probability of change in income or well being as a result of a shock upsetting the initial position. While poverty is an ex post feature, vulnerability is an ex-ante concept i.e. the likelihood of suffering loss due to some shock.

Further, a time dimension is introduced as vulnerability is defined in a dynamic context. The dimensionality of the problem changes as one incorporates a priori expectations about fluctuations and also a time path of (possible) adjustments after the occurrence of a shock. Poverty on the other hand has usually been discussed in terms of comparative statics with less concern over the actual

processes of change and adaptation that underlie it.

Vulnerability can be viewed from a different perspective as the extent of 'recoverability'. Non-recovery from shock can be an indicator of vulnerability. Different degrees of recovery and non-recovery can be considered, depending among other things on the length of the time period chosen. There are two aspects of full recovery, one the magnitude and the other the speed with which recovery is achieved. If recoverability is good, then for any departure from the initial state, recuperation will be made quickly and with no permanent loss although some temporary losses may be borne in the process itself. A classification of degrees of vulnerability based on the extent and timing of recovery will be attempted later. (See Section 1.5)

Expectations play an important role in the perception of risk. There is an impact on current behaviour and on expectations about future positions which can cause a loss in (current and future) welfare. Thus perceptions of risk and vulnerability should be given some importance, as are the consequences of shocks in understanding behavioural responses.

The crux of the issue is the problem of instability and the inability to regain one's initial position after the occurrence of a shock. Stability analysis in general equilibrium theory provides a good framework in which to elaborate this concept. The theory of general competitive equilibrium[4] establishes the desirability of a stable equilibrium position and then examines the question of tendency to equilibrium. The search proceeds for an adjustment path which will bring one back to the equilibrium situation after occurrence of a shock. This tendency towards equilibrium will depend on three broad factors;

i) the nature and size of shock

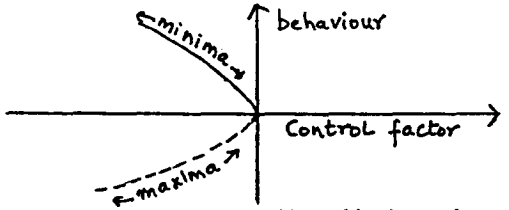
ii) the initial conditions, and

iii) the adjustment path

One can use this framework to analyse the factors determining vulnerability. This is done in the following sections by specifying the nature of shocks (Section 1.2), the initial conditions of households (1.3) and then the kind of adjustment responses and mechanisms that come into play (Section 1.4 and Chapters 2 and 3).

A simple explanation of the undesirability of unstable incomes follows from assuming a diminishing marginal utility of income (under the expected utility hypothesis). The loss or disutility from a one Rupee fall in income is thus greater than the gain in utility from an additional one Rupee, resulting in a net loss in welfare even when fluctuations average out around a given trend.

In pursuing the stability question further it may be helpful to borrow concepts from Catastrophe theory.[5] One can characterise equilibrium positions as stable, semi-stable (as in a point of inflexion) or unstable. In a simple two dimensional case one can illustrate a catastrophe ('fold' catastrophe) as follows:



On the stable path (dark line) as the system moves towards a minimum it comes to a point of inflexion beyond which the system becomes unstable (dotted line). For instance the jump from life to death could occur on the behaviour space in response to changes in food consumption (control variable). It is possible to bring in multi-dimensionality as the number of control factors are increased.

The reason why this analogy may be useful is that it is based on qualitative features rather than quantitative features in the determination of stability. What is important is the qualitative shape of the curve (adjustment path in the earlier terminology). One can discuss paths of recovery with this in mind (Section 1.5) and also the qualitative response to risk due to the presence of certain less quantifiable, non market traits e.g. household features. (See Section 2.3). It is also broader than traditional stability analysis which relies on gradual (and continuous) price adjustments. Secondly, catastrophe theory deals well with sudden, discontinuous changes. For example the death of an individual is a sudden change likely to throw one completely off the original position/cycle.

The difference between poverty and vulnerability can be illustrated by some simple examples. Consider two households, equally poor. Suppose household A has a larger number of young children than B. In the event of a shock such as an offseason decline in employment, household A is likely to be more vulnerable to sickness or starvation among its members if one assumes that children are less able to survive shortfalls in food consumption and more prone to illness, when they occur.

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The specific context chosen to concretise the concept of vulnerability is that of rural labour households. First, the choice of the household as the unit of study is based on the consideration that although individual welfare is of ultimate concern, the household is the unit of organisation and decision making (especially in village economies). It is also the best unit for examining the provision of security i.e. in a sphere where intra household adjustments are likely to be important. There may be societies where households cannot be identified because of a state of flux, due to

partition, merger, extinction and migration[6], and display different types of mobility. We are assuming a stable household can be identified as a unit, and processes such as migration can be viewed as adjustments.

The context is narrowed down by focussing on labour households in rural economies, i.e. those reliant predominantly on wage income. There is no a priori reason to assume that labour households in urban areas may be more/less secure but their responses will be different and they lie outside the scope of this thesis. These are asset-poor groups with no ownership (or very little) of land, the major asset in rural agricultural economies. These households face opportunities and problems quite distinct from those of farm households. Not being within the confines of the "farming system" but part of the larger rural economy[7], they are affected both by risks directly related to agriculture and others external to it. Labour power is the major endowment of such groups and their adjustment mechanisms will be dependent to a large extent on their earning capacity and the behaviour of the labour market. (More on the definition of labour households in Section 2.1.)

Labour households may not only suffer more from fluctuations but also be the first to do so. This was recognised as early as 1880 by the Famine Commission in India. As they predicted "The first effect of drought is to diminish greatly, and at last to stop, all field labour, and to throw out of employment the great mass of people who live on the wages of such labour."[8]

The paper is set in the general context of rural households in developing countries though most examples are drawn from India. A micro approach will be pursued in the elaboration of causes, effects, dimensions of vulnerability.

1.12

Before outlining the conditions under which instability is found to occur it is useful to take a broader historical perspective on the changing nature of social, political and economic institutions, and the consequences thereof. The occurrence of risks is not a presesnt day phenomenon, although the nature, frequency and impact of shocks could have changed over time. It may be argued that the vulnerability of individual households is low in primitive or tribal economies characterised by strong elements of mutual sharing and in developed capitalist/socialist economies with sufficient provision of social security. To that extent, the problem is more acute in a developing economy where one finds varying degrees of a) reciprocity and b) state provision of security. A brief account is provided of the historical changes in developing societies and its implications for vulnerability.

On the one hand there is a noticeable change in the nature of shocks the best example being the decline in frequency of large scale famines in India over the last century[9], which has put a check on periods of acute scarcity affecting large groups of people. In some regions the instability of rainfed agriculture has been lowered by the spread of irrigation but at the same time overuse of common grazing lands, partly due to the rising population pressure, and soil erosion has worsened effects of seasonality in other regions. Modern medicine has brought with it mixed blessings. While it has curbed mortality through control over some fatal diseases such as smallpox, it has also meant more 'survivors' who may suffer from greater morbidity, disability and also bear the burden of high medical expenses. Technological change has also altered the nature of losses, for example the rise in accidents from mechanized operations in agriculture. Vulnerability to starvation and death may have lessened

over time but not necessarily vulnerability to sickness, undernutrition, poverty.

Changes in the form of shocks are closely associated with a change in the institutional structures which have grown as adaptations to these risks. The most apparent change lies in the process of 'modernisation' which encompasses greater commercialization, the spread of the market economy, the switch from subsistence production to production for the market and a host of associated factors. Individuals become more susceptible to market shocks. The marginalisation of many small peasants, into 'pure labourers' makes them heavily reliant on the market for a minimum survival. At the same time, the spread of the market may lead to a change in the ethos of sharing, for example the move to more impersonal relations from earlier ones of mutual exchange and help. Certain arrangements such as labour tying or labour exchange which may have arisen initially due to production uncertainty (and been a form of mutual help) may be on the decline with changing economic and social conditions.

One important feature is the rise in population (and greater density) which alters relative resource scarcity quite significantly. The presence of surplus labour makes it less problematic for an employer to get a certain labour supply and could be one cause of the decline in 'patronage'. (Contractual arrangements in labour markets will be dealt with in Section 3.24.) Rising population is one of the factors behind greater landlessness. Lastly technological change is altering the nature of institutions in rural economies. Given the interlinks between resource position, social structure, institutions and adaptation to risk (or provision of security)[10], one can see the importance of having a broad perspective on the problem when discussing the question of vulnerability in the present context.

One should also mention the moral economy approach which argues that the desire to avoid crises has led to a 'subsistence ethic' which places moral controls on the better off to provide for social arrangements which insure against these crises. Further it is argued that as the market economy develops, this moral principle breaks down.[11] This view has been challenged by the 'rational' approach[12] which rightly suggests that peasants in precapitalist societies are also guided by egoistic motives. However there may be good reasons for the elite to behave in an altruistic manner in traditional societies, and this may be changing with the process of development.

Therefore one needs to investigate the presence or absence of different kinds of insurance mechanisms for achieving stability and reasons for their inadequacy (this will be followed in Chapter 3.).

1.2 On the nature of shocks:

In this section a description of the kind of shocks that cause instability among rural households is provided. There are a broad range of external factors which could precipitate a crisis. Chambers (1983) groups these contingencies as follows: social conventions (weddings, funerals, dowry), natural disasters (floods), physical incapacity (illness, accident, childbearing), unproductive expenditure and exploitation. Other events such as cyclical changes and political events (wars, civil disturbances) can be added to this list. Then there are market shocks i.e. in wages, prices which may be caused by demand or supply variance or covariance or market imperfections. (See discussion in Chapter 3 on the labour market.)

A better classification of risks is possible based on certain characteristics of the events i.e. size, incidence, frequency, predictability and linkage effects. Let us consider each in turn:

i) Size: Shocks can be small or large, i.e. differ in severity, an illness being an example of former and asset loss of the latter. The impact of shocks is being evaluated in a relative manner (i.e. relative to one's initial position[13]) and of greater concern if it moves the household below some absolute lower boundary (for a vector of variables).[14] These boundaries may not be uniquely defined as the discussion on poverty measurement illustrates (1.6).

ii) Incidence: A shock may only affect an individual/household or else have an impact on a larger group of people (e.g. labourers) or even an entire region. For example ecological changes cover a large geographical area, regions prone to more climatic variations thus becoming more risk prone.

Whether the risk relates to individuals or a community is important from the perspective of 'insurability'. If individuals in an area face positively correlated risks their ability to maintain a mutual insurance scheme declines (see Section 1.4). In terms of stability analysis, while recovery from an individual shock is a problem of achieving local stability, the ability to maintain a globally stable position after being hit by a large shock is a different matter. It is issues relating to local stability which are often overlooked but if a household cannot maintain a locally stable position it is likely to suffer from global instability as well. It does not however follow that those with local stability are globally stable. For example an individual may not be susceptible to disease during a normal year but be vulnerable to disease in a post-drought year.

iii) Frequency: This is an important determinant of the persistence of a shock. A shock may be a one-off event and leave wealth unchanged causing only changes in current income (i.e. assuming

perfect capital markets) or be a recurrent event. Those occurring more than once can follow a random pattern or display systematic variations. Seasonality is an example of a recurrent event which has both random and systematic components.

Most rural environs are marked by strong wet-dry seasonality. Seasonality is reflected in several variables, e.g. in health (and food consumption) where indicators of living standards such as malnutrition, morbidity, and mortality are often found to peak in one season, in employment patterns, in prices and wages. Seasonality is not the cause of poverty but the factor bringing regular crisis points to the lives of the rural poor.

One can distinguish between seasonality and seasonal variability which refers to fluctuations about a seasonal mean. Seasonal effects may occur as "seasonal swings" which are a repeated but reversible hardship or as "seasonal ratchets"[15] which are events which push a household further down and from which full recovery is difficult. Seasonality can have both short term and long term effects especially when seasonal food shortages interlock with seasonality of calorie requirements and of disease incidence.[16] For example, loss in body weight may be a reversible seasonal effect. However, a loss in body weight which is not made up in the subsequent period, may make the individual more susceptible to infection, and act as a ratchet effect and even lower the life span. (One has to also rule out cases where the loss in body weight is occurring in the peak agricultural season as the result of increased physical ability and fitness.)

Sale of certain assets or other forms of permanent damage may be less reversible and point to the operation of a ratchet effect. But there is also likely to be a ratchet effect operating on the environment itself, both physical and social. Each shock may make the environment less favourable for recovery. Examples might be falling

productivity of the land through soil erosion or desertification or decreasing viability of social adjustment or insurance mechanisms as the burden placed upon them increases. The ratchet effect on the environment can be linked to the over use of public goods. In a crisis, the use of common property resources may be threatened by high pressure on it, acting less as a stabilising force. Forests, pastures, riverbeds have been found to be seasonal buffers, being a direct source of food and fodder and also of employment and income.[17] Ratchets are more likely to be provoked by large shocks, e.g. a severe failure of the seasons, although one could also have a gradual process of pauperisation with each crisis taking the household to a lower level of living.

The dip in real income faced by the rural poor in seasons, when lack of employment and low wages is coupled with high prices of food grains is evident from the following data on Bangladesh.

Wholesale price of medium rice (1976-77), Agricultural Labour wage rate (1977-78) and average household cereal stocks (1976-77) in Matlab thana, Bangladesh*[18]

Month	Wholesale price of med. rice (taka/maund)	Agricutural labour wage rate (taka/day)	Average household cereal stock (maunds)
March	116	10.0	2.1
April	111	8.0	2.9
May	122	7.5	5.1
June	118	7.5	3.1
July	123	6	2.8
August	123	*	1.0
September	125	*	1.0
October	125	6	0.7
November	105	7.5	3.2
December	111	7.5	5.3
January	113	7	2.8
February	118	-	1.1

* Limited agricultural work
\- Data not available

August to October is the period of greatest scarcity, i.e. when rice prices are highest, household food stocks are lowest and agricultural labour demand at its weakest. Vulnerability here can be associated with a cluster of unfavourable events. (See Section 1.5)

Food stocks show a bimodal peak with the onset of the "aman" harvest in December and the "boro" rice and other winter crops harvest in May" but do so at different levels for landowners and landless, with the latter's stocks being completely depleted in October, revealing the precariousness of the latter's position.

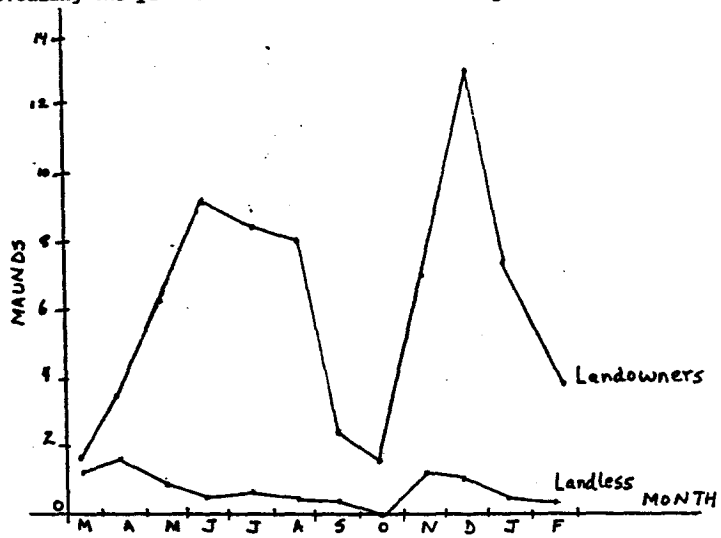


Figure 1: Household food stocks on the day of interview by month of interview of 8 landowner and 17 landless households, Matlab thana, Bangladesh. Source: A.K.A. Chowdhury

iv) Predictability: Whether the occurrence of shocks is predictable (whether based on subjective preferences or some objective measure) is relevant for decision making and planning. For instance an individual may be able to affect the occurrence of events by his own activity (moral hazard problem). (This will be discussed in the

section on labour markets in Chapter 3).

v) Linkage effects: The worst form of vulnerability occurs when variations in several factors move together either as a cluster of events or a sequence of shocks, each reinforcing instability, and lowering the ability to recover. A sequence of events can make the disadvantages cumulative (instead of additive) as for example[19] an illness leading to non-participation in the labour force, consequent loss in income, fewer resources for medical expenditure and so on. Similarly shocks may be multiplicative rather than additive, the former intensifying the impact. Other properties of shocks such as stationarity of the disturbances, spread, skewness and kurtosis of the random terms and serial correlation among the shocks are important in determining vulnerability and need to be investigated in future empirical work. For example, consider two serial correlation patterns for the variable X

$$x_t = c + u_t \quad \text{and} \quad x_t = x_{t-1} + u_t$$

with c a constant and u a random shock. The second case is much worse, as the previous position (extent of recovery) determines the current state.

1.3 Initial Conditions:

The initial conditions of the household are largely responsible for the kind of adjustment mechanisms that arise in response to shocks and their effectiveness in enabling recovery. Before looking at the economic factors, it must be emphasized that the social and political structure mentioned earlier influences both the extent of vulnerability and the possibilities for adjustment.

Coming to the economic condition of a household, one can associate non-recovery with a lack of buffers or lack of insurability.

One of the main reasons for this is the inability of poor households to choose an appropriately diversified portfolio. Although asset diversification may be limited, poor families may have to diversify in income earning activities to survive. Assets play an equally important role in adjustments and the stability of a household may be determined by its asset position. A brief description is provided next of some of the assets of rural labour households to highlight this role.

The main asset of labour earning households is their labour endowment, the quantity and quality of which depends on household composition and characteristics. In the words of Ledesma[20], "As a landless worker, it is solely your body that earns a living." Apart from labour, such households are likely to be asset poor, hence their vulnerability. The worst off are those who are poor in terms of labour power as well.

Let us look at the other assets that a household may possess and how they help in adjustments to risk. One basic asset is housing, the durability of which is determined by its material constraints, e.g. whether it is a "pucca" (permanent) structure, or a "kucca" (temporary) one. A "pucca" house may not be easily destroyed and also be of social importance i.e. giving a certain prestige. (This can be useful in times when a household's status is important for determining loans it receives .) Those with a "kucca" house may suffer more easily, as for example, it collapsing in a flood, and requiring money and time to rebuild. Housing is an asset which determines the absolute living standard and also relative position (through status) which may be important for adjustments such as loans. It should be noted that a house is illiquid as an asset and is useful indirectly i.e. as for collateral.

Other personal property, such as consumer durables can act as sources of security, e.g. either be sold or mortgaged temporarily to tide over a bad period or used as collateral to receive loans. Consumer durables are not substantial among poor rural households. However in some regions of India, jewelry can be an important factor. Jewelry is a store of wealth in such situations. The wedge between market and personal valuation, i.e. assuming existence of imperfections in the market, of assets may be large just at times when there is a pressure to dispose of assets and the earnings from it will depend on market conditions. There are several examples to show that the value fetched for the sale of an asset when in "distress" is less than what it would generally fetch in the market. Possession of jewelry can be helpful in adjustment mechanisms[21], while a decline in family jewelry can be an indicator of vulnerability.

Lastly, there are living assets, i.e. animals, livestock, which are more likely to suffer damage as through lack of food or disease. Losses in livestock may occur through deaths or through "distress sales" which are often made at prices unfavourable to the seller. The buyers gain at the expense of the losers.

The consequence of a loss in assets can be disastrous for a poor household assuming it is not part of a normal cycle. A cut in the value of stock of assets may be more serious than a fall in the income stream, as it is not only a current period loss but also one in subsequent periods, both because of the lowering of future income and as assets are expected to appreciate over time. Secondly a loss in assets involves a fall in income as well as in status and general living conditions, which are less easily reversible. Lastly, assets by their very nature are usually lumpy, indivisible, involving a large initial fixed cost and therefore more difficult to replace when damaged.[22]

However one finds that assets do act as a buffer in times of contingency. For example if the income base of a wage earning household collapses in a seasonal slack period, it has to rely on its non-labour assets and other claims for survival. The sale or mortgage of ration cards, observed in families of poor working women in Kerala[23] to obtain loans to purchase necessities for daily life can be considered an extreme form of adjustment. Loss of the ration coupon results in purchases of food at higher open market prices and can lead to a more undesirable situation in the future. This takes us on to the nature/form of adjustment paths i.e. the kind of claims that can be made to help in recovery from shocks.

1.4 Paths of Adjustment:

The kind of adjustment made in response to a shock will be determined by the nature of claims that a household can make: a) on its own members, b) on friends and relations, c) on society, d) on the state, and e) on market mechanisms.

Before further discussion one can attempt to classify response to risks. This can be divided into two broad groups:

1) adaptation and 2) adjustment.

Adjustments connote smaller changes than adaptations. The two are also distinguished by the time factor, adaptations being a slower and long run process of response to the occurrence of certain events in a given area. Adaptation may be biological, i.e. as reflected in human genetic resistance or cultural as through changes in organization or occupational choice. The focus here is on adjustments, which may be made before, during or after a crisis. They are reflected in different rates of recovery depending on the time period taken into account.

For instance, there are two types of adjustment mechanisms against risk for labourers:

1) those devices which have been adopted to facilitate adoption of alternatives to minimize potential losses e.g. skill acquisition, diversification of income earning activities.
2) those devices designed for managing the consequences of inevitable losses, e.g. borrowing, decline in consumption.

The first group comprises long-run and short-run strategies while the second category consists mostly of short-run mechanisms.

Another type of classification for adjustments can be made as:

1) risk reducing strategies which are undertaken before the risk, e.g. migration, and
2) risk diffusing strategies which deal with the consequences of a crisis, i.e. loss management.

The fundamental question is this: what kind of responses (market and non-market) exist to overcome adjustments and to provide insurance through marketing/shifting of risks. If markets were efficient or social and institutional networks were sufficient, the burden of risks would be shared, and the problem of vulnerability correspondingly reduced.

First let us look at social insurance, networks which are geared towards providing all individuals with a minimum 'survival' level of security. Developing economies are characterised by a variety of social networks but the ability to participate in and gain from such is itself conditioned by the initial position of the household i.e. its income, status. Although informal inter-household exchange, of goods, money and time is found to be of importance among the poor[24], it is at the same time difficult to sustain a system of mutual insurance among them. The advantage of risk sharing is greater in a group whose members have independent risks or preferably negatively

correlated risks. Such groups will consist of people with equal ability to insure each other, and with the least direct dependence of risks across individuals. However it is likely that among a family or among labour households, or poor households, risks are positively correlated across members, making coinsurance more difficult. For a pooling of larger numbers and those with independent risks one has to rely on market mechanisms.[25] For example, a study of the urban poor in Kenya, Malaysia, Philippines and El Salvador[26] found inter-household transfers to represent a significant source of income for the poor. However, the survival of an insurance providing social network depends on the number of economically viable households that stay within it. If each household has uncertain labour earnings, and is risk averse, and pays an insurance premium in good months, then a household has incentive to insure completely against any deficit from its threshold level of income but none to insure for the uncertain portion of income above the threshold.[27] The expected net contribution towards the insurance scheme was found to be negative for very poor households, positive in the poor and average groups and zero at very high income levels. Where expected income is above the threshold level, the household may not wish to contribute to the social network and one may need some rule relating to fairness of burden in order to extract a contribution from the better off household. Else the rich may contribute if they are highly risk averse. On the other hand, there may be some degree of social compulsion as in caste groups (in India), where the better off members continue to contribute for the welfare of the poorer section.

The provision of insurance through the market is generally found to be inadequate. In the absence of perfect information, even the competitive outcome in markets for insurance can be non-optimal.[28] The outcome can be no better in imperfect (rural) markets. The two

major factors leading to non-optimal provision of insurance are moral hazard and adverse selection. Adverse selection is likely to be the more critical problem in rural areas, because of the unequal distribution of information. The kind of shocks discussed so far are also not easily affected by individual action.

Consider two types of buyers of insurance. The B type or bad risks and the G type or good risks. For an insurance company to be viable it needs to charge two different premia. If this is not feasible and only one premium is set then it is quite possible that for every premium, the sum of excess payments (by type G) is less than the sum of deficiencies (by type B). No premium will equate gains and losses, the insurance company will thus be unable to sell a policy and will end up attracting too many 'lemons' (while driving the type G out of the market). A case for public provision of insurance can be made in such a situation. The criteria of market malfunction and hence intervention may be either a non-market clearing economy or one which is Pareto inefficient.

The problem of moral hazard relates to incentives i.e. the power of individuals to change the outcome after purchase of insurance e.g. by being less careful or even taking risky choices. Arrow[29] would argue for compulsory Government insurance but there may be high costs to such a scheme, both administratively and in the collection of information.

We shall come back to the imperfections and constraints which might be prevalent in rural markets and their crippling effect on adjustment paths in Chapter 3.

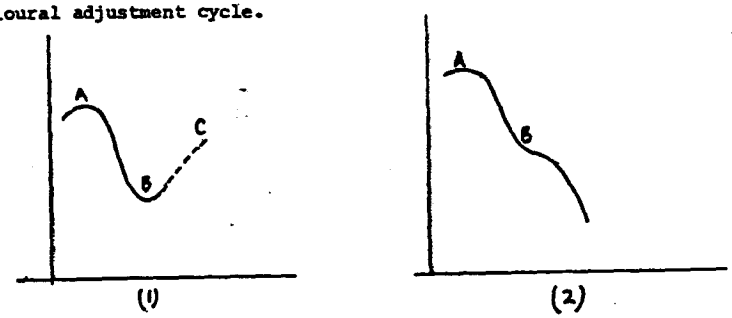
1.5 An attempt at classification:

Different degrees of vulnerability (and vulnerability to different variables) can be represented by variations in

'recoverability'. The choice of a time-period becomes crucial in determining the extent of recovery of a household. A "reasonable" time period may be taken to be relatively short, and taken to approximate a season (i.e. 6 months or so) since a household which has not recovered from a crisis within this duration may become even more susceptible to risks in future periods.

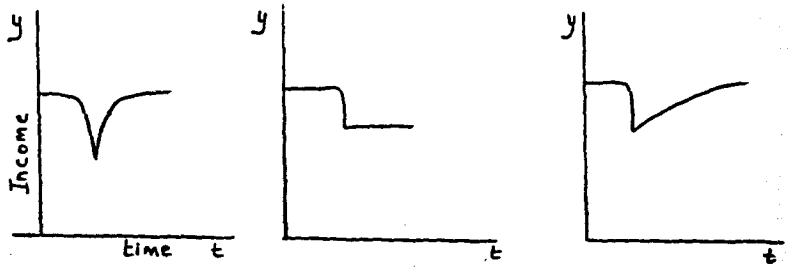
Non-recovery can follow from the entire household being wiped out, some members of it being wiped out or severe asset losses. The gravity of the situation depends on which members are lost, as the death of an infant though painful may not be as serious as the death of an adult working member which can subsequently put the entire income of the household into jeopardy.

Consider the occurrence of a natural disaster (which the word catastrophe connotes), the effect on equilibrium will depend on the behavioural adjustment cycle.



Starting at A, a shock moves the agent down to B, which in the second diagram is like a point of inflexion and takes him further into an unstable region i.e. a downward spiral of (non-recovery) losses. Or else it may be a semi-stable position from which he moves back again (as to C) to a favourable state.

There can be various types of recovery as illustrated below with the time taken to recover being the reference variable.



This brings us to the question of identifying "permanent" loss. Some events like loss of life are visibly permanent and irreversible whilst others like sickness may leave permanent scars (and be prolonged) e.g. lower an individual's capacity to work or his "capabilities" in Sen's[30] terminology. Loss and recovery are two sides of the same coin and one can look for indicators of both at the same time. Both quantitative and qualitative evidence may be required to measure the extent of loss. For example, the quantitative loss in endowments (including labour power) can be measured by deaths, losses or sales while the qualitative decline is more difficut to ascertain. For example, it may be the effect on individuals of food shortages or on animals of fodder shortage with a subsequent decline in yield.

Vulnerability cannot be cast in a black-white distinction and degrees of vulnerability may be gauged from a difference in indicators. Degrees of vulnerability will essentially depend on the size and permanence of loss and extent and timing of recovery. Those in the non-recovery case being the most vulnerable, and those in the partial recovery case being less so. Consider the following classification, where extent of recovery is linked to a time dimension through impact on a vector of variables.

Crisis	Non-recovery	Partial Recovery	Full Recovery
Variable affected	permanent loss	(within 6 mo/1 yr)	(less than 6mo)
1. Human			
a) death of[31] member	worse if adult (male) than child	--	--
b) sickness	if disabled and unable to earn income in future	if loss in body weight with a cost in terms of earning capacity	if recovery in short time
c) decline in food consumption	permanent loss in weight, susceptibility to infection, etc.	temporary losses with more negative effects	recovered in subsequent period
d) migration	--	if some income sent back	if temporary migration only and sufficient inflow of income
2. Animal/Livestock			
a) death	permanent	if stock replaced	fully replaced
b) sale	may make a financial loss even if replaced and unable to replace	possible to replace partly but may be more costly	part of normal asset depletion and replenishment cycle
c) illness, disease	if disabled and lower productivity	temporary fall in in productivity	possible
3. Other assets			
a) damage to house, buildings	if destitute i.e. complete destruction	damage repaired but not fully and at high cost	if full repair possible
b) other durables e.g. jewelry	if sold	if pawned or mortgaged	if new jewelry re-acquired
c) financial liabilities, i.e. debt	if increasing burden leading to bondage	if partial repayment	if full repayment possible

1.6 Measurement of vulnerability:

Measuring the extent of vulnerability is problematical and challenging. A brief discussion of the nature of problems that ha appeared in the measurement of poverty can provide an impression o the difficulties likely here as well. Although the two concepts o poverty and vulnerability are quite distinct, there is likely to b intersection of the two groups in practice.

Measurement of poverty has been based on 'average' income or consumption and ignored the variations in living standard.[32] One w of defining vulnerability can be as the probability of falling belo poverty line representing a minimum subsistence level of consumptio (Issues such as how much of a shortfall and how long for become important.) The problems in poverty measurement get carried over i this case. The distinction between the poor and ultra-poor can be made on the basis of degree of undernutrition from which they suffe e.g. while the poor may be at the risk of inadequate food and hunge (but not undernutrition) the ultra-poor face the risk of undernutrition.[33] The two groups thus differ with respect to vulnerability to undernutrition and hence possibly to illness, starvation etc. They will also differ in behaviour and would requi different policies e.g. a food component being an essential compone of any welfare scheme for the ultra-poor.

The entitlement approach to poverty differs from this. It ha greater relevance in estimating causes and indicators of vulnerabil and will be discussed in depth later (Section 3.26).

Some issues of concern in poverty measurement are touched on next. There is an initial problem of choosing the appropriate unit i.e. income, consumption or utility for measurement. If an income measure is to be used to represent a 'subsistence' level as is done most often, one finds large disputes over the estimates of required

calorie intake to define subsistence, with increasing emphasis on the need to take account of intra-individual and inter-individual variations. Calorie intakes should also be specified in relation to the energy expended i.e. the nature of activities performed and allow for multiple equilibria between levels of energy and work. Apart from the conceptual problems there are numerous empirical problems as well and as a result there have been a multiplicity of measures defined in the Indian context.[34]

This also brings out the need to disaggregate further below any one "officially"[35] defined poverty line. For instance, by identifying sub-groups within the poor by characteristics such as race, sex of head, household size, location, number of children, age and occupation of head and so on one can get a better picture of poverty. In his profile of poverty, Anand does the same and captures certain features of the poor, "A Malay farmer in rural Kelentuan has a worse than three-fourths probability of being poor. In order to design policies and projects to help the poor selectively and with minimum leakage, it is necessary to identify smaller, more homogeneous groups such as these, with particularly high incidences of poverty"[36]. The emphasis on sub-groups is based on the recognition of the micro approach to the alleviation of poverty.

The fuzziness in defining poverty may plague the definition of vulnerability as well. Ultimately, the threshold below which a shortfall is harmful may have to be subjectively determined (i.e. for each household).

1.6.2

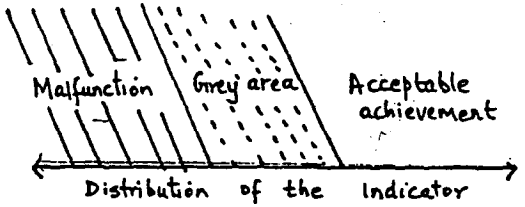
In attempting to find measures which indicate vulnerability of households, the more general question of trying to identify regions (e.g. drought prone), or societies (e.g. isolated with constraints to mobility) wherein households may be more vulnerable is left aside.

Indicators of vulnerability for individuals and households are essentially the indicators of non-recovery.

At one level, we can identify vulnerable households (ex-ante) by their income level and asset position, i.e. a measure of their security level or fall-back position. For instance, from historical data, both income and asset levels and their variance could be used as indicators of degrees of vulnerability. Next, looking at the sources of income, and their stability, for wage earners, the probability of being employed relative to dependents (household size) can give a good indication of the likelihood of the household being vulnerable.

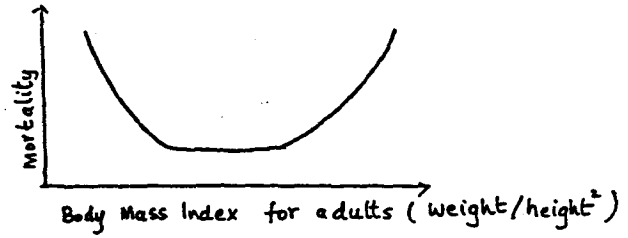
A second set of measures are frequency of sickness, morbidity, in a household, or frequency with which loans are taken (and knowledge of their purpose). Here a probability measure is being based on relative frequency. Third, measures can be more specific, when the occurrence of a "crisis" is identified, i.e. ex-post and a series of variables used to identify more/less vulnerable households.

An easier way to identify indicators is by distinguishing between state variables and outcome variables, and the relation between them as given by the risk curve. The range of vulnerability can be represented by a spectrum of the indicator as shown below diagrammatically:



For example the indicator could be food consumption (representing vulnerability to starvation) or anthropometric measures such as expected weight for age of children (indicating vulnerability to undernutrition or malnutrition). The outcomes (such as mortality, morbidity) can be associated with functionings of the human factor and

nutritional parameters as the associated measures. A stable relation between the two (i.e. outcome and state variable) may be possible as follows:[37]



The choice of the cut-off point of unacceptable achievement determines vulnerability.

As a more general example, consider the indicators given below:

In a crisis the household is	If	a life	b health	c nutrition	d assets	e livestock
more vulnerable		high prob. of deaths	permanent decline	permanent loss in body wt.	sale, debt burden	death, sale
less vulnerable	but	no death migration	illness temporary	temporary loss	fewer sales, less debt	no deaths fewer sales

The above table deals with two types of variables, the first set i.e. life, health and nutrition determining an individual's well being and hence having a direct effect while the second set namely different assets are variables which reflect or may lead to vulnerability in the first set through loss in income, status or shelter.

One cannot go much farther at a general level in defining measures of vulnerability because of its dependence on the household, time, location and other characteristics which vary with circumstances. For example, sale of livestock can be an indicator of high vulnerability depending on what extent the sale was part of a natural cycle and to what extent precipitated by a shock and non-recoverable in the near future.

Without looking at the adjustment mechanisms (and their effectiveness) it is difficult to separate cause and effect. We therefore go on to look at adjustment mechanisms next.

Household structure and the nature of intra household adjustment will be discussed in Chapter 2. Moving from there to market forces, adjustment through the credit and labour market will be discussed in Chapter 3 and the role of the state will be briefly considered in Chapter 5.

Footnotes:

1. Both quotes from B. Hartmann and J. Boyce A Quiet Violence: View from a Bangladesh village. Zed Press, London. 1983, p. 123 and 172 respectively.
2. R.H. Tawney Land and Labor in China Beacon Press, Boston. 1966 p. 77.
3. Although most shocks may be exogenous some people are more likely to be hit by shocks by the nature of their position.
4. Arrow and Hahn.
5. See E.C. Zeeman or Woodcock & Davis for a simple exposition. A catastrophe is defined as any discontinuous transition that occurs when a system has more than one stable state.
6. T. Shanin.
7. See Introduction in J. Harriss (ed.).
8. Report of the Famine Commission 1880 p. 49, para 109.
9. See Sen Poverty and Famines.
10. Hayami argues that it is easier to enforce institutions in tightly structured village communities which in turn is made dependent on relative resource scarcity.
11. See James Scott who takes the argument a step forward in predicting greater peasant uprisings and revolts as a consequence of the breakdown of this moral principle.
12. Samuel L. Popkin The Rational Peasant Berkeley, Los Angeles and London 1979.
13. Otherwise it is the rich who have more to lose who may be defined as more unstable.
14. Thus, vulnerability is a position of instability which is likely to cause an absolute shortfall in certain requirements.
15. R. Chambers, R. Longhurst, D. Bradley and R. Feacham 'Seasonality in rural experience' in Chambers et al. (eds.).
16. S. Schofield (1974).
17. See N.S. Jodha 'Market forces and erosion of common property resources' Paper presented at the International Workshop on agricultural markets in the semi-arid tropics. ICRISAT, October 1983.
18. Source: A.K.M. Alauddin Chowdury, S.L. Huffman and L.C. Chen 'Agriculture and nutrition in Matlab thana, Bangladesh' in Chambers et al. (eds.).
19. R. Chambers Rural Development (1983) p. 112.

20. Antonio J. Ledesma 'Landless Workers and Rice Farmers.' IRRI. 1982.

21. See Heyer for a description of 'jewelry loans'.

22. This may be one reason for the imperfection in asset markets in rural areas.

23. See L. Gulati's study of five families of poor working women.

24. See Butz and Stan, a study on Malaysia.

25. For an example of complete failure of social mechanisms and individualized existence, see the conditions of the IK described by Colin Turnbull in The Mountain People, Picador, Pan books, 1973.

26. See D. Kaufmann.

27. Kaufmann defines the threshold income in terms of the perceptions of the household itself vis-a-vis a sufficient income to meet a certain minimum of basic needs.

28. See M.V. Pauly.

29. K. Arrow (1970).

30. A.K. Sen (1983) Poor, Relatively speaking.

31. One has to be careful about accounting for deaths which occur in the natural course of events.

32. An exception may be Polly Hill, who in her treatise on peasant inequality took ability to withstand the shock of a late or poor harvest as a criterion of what she loosely described as the farming unit's standard of living (Rural Hausa, Cambridge University Press, 1972).

33. See Lipton (1983).

34. For the conceptual problems see Sen (1981), Sukhatme, S. Batliwala, I. Rajaraman and for some empirical estimates, the papers in Srinivasan and Bardhan (eds.).

35. Assuming that the 'official' definition is not a policy definition based on normative principles to reflect policy proposals.

36. Inequality and Poverty in Malaysia, Oxford University Press 1983.

37. From W.P. Mclean.

CHAPTER TWO

HOUSEHOLD ADJUSTMENT MECHANISMS

2.1 Introduction:

Vulnerability is in effect a state where adjustment responses to shocks are inadequate for full recovery over a reasonable time span. In a "perfectly" functioning world, fluctuations in income over a lifetime should be smoothed out, allowing each household to obtain a stable level of consumption, through transactions in the financial markets. In developing economies, it is not a total lack of adjustment mechanisms but their inadequacy particularly at low levels of income, and the reasons for inadequacy, that become important issues. Adjustment mechanisms vary in different societies (making cross-cultural comparisons difficult) and over different periods of time. Possibilities for inter-household exchange do exist (see 1.4) but are not discussed further.

We begin by looking at household structure and intra-household adjustments.

The crucial issue is the effectiveness of these adjustment mechanisms for the poor, both in terms of the cost involved and the extent of recovery possible. One therefore needs a classification in terms of effectiveness of the adjustment mechanisms. The adjustment mechanisms may be said to be "ineffective" if they lead to:

a) a sustained decline in necessary consumption or

b) a permanent loss in productive assets (including family labour) or even

c) large scale out-migration.[1]

A decline in necessary consumption (food and other basic needs) as against social consumption (like expenditure on weddings which may be more easily postponed[2]) is likely to impair future production

through the effect on individuals unless it is transitory. For example, Jodha[3] documents a decline in per capita consumption of food grains in drought years in Rajasthan and an even larger decline in the consumption of protective foods such as milk, fats, sugar. Similarly, the cycle of asset depletion and replenishment need not be undesirable in itself (it may well be the natural way of meeting fluctuations) but again its effectiveness depends on the implications for future production and the time lag between depletion and recovery. If the depleted assets are not replaced soon, the next crisis may occur and with it another run of resource depletion. If recovery is not made quickly, the household moves into a progressively more vulnerable position over time.

2.2

We now go on to define "labour" households and elaborate on the disaggregation of household structure which may be required to capture the determinants of vulnerability and adjustment responses. The characteristic feature of the group "labour households" is their lack or very little of other assets except labour power. A broader definition of labour households could span the following occupations:

i) agricultural labour either casual/daily or on a long run/permanent contract

ii) non-agricultural work

iii) work of artisans and rural craftsmen

iv) labour income from outside, i.e. migrants

v) unpaid labour - i.e. a range of household work

An idea of the scale of the problem can be gauged by noting that in India the proportion of rural wage labour households has been steadily increasing over time and now accounts for roughly 35% of the Indian population[4], where wage labour households are defined as those

with more than 50% of income from wage labour. Rising poverty has gone hand in hand with an increasing number of landless labourers, and with a constant or declining trend in the real wage of agricultural labourers in much of Asia.[5]

Disaggregations by class and sector have often been made but labour households have usually been treated as a homogeneous entity. Labour power of a household however is not a scalar, but a vector of components, and may even be characterized as a matrix (see Chapter 3). To identify different household characteristics and then to distinguish between household groups may be important in identifying the vulnerable. However further disaggregation within a household though useful creates problems when decision-making models are introduced.[6]

To typify the household, one may draw from anthropological literature where the household has been defined in many differing ways. It may be interpreted as the residential family which encompasses those who are tied by genealogical relationships and also share consumption. Alternatively it may be defined as members who are co-parcenary, i.e. sharing entitlements to land or other assets (a case where economic ties are wider than food eating ties). The most widely used concept is that of "commensality" as the defining criterion of a family or household, i.e. the hearth groups[7] sharing common domestic arrangements. These households may then be classified on a range from nuclear to fully extended families.

The "household" is not a constant, it is different over time as well as with respect to various functions. It may change on the one hand through the natural developmental cycle over time (the Chayanovian concept of demographic differentiation) and also in response to external factors. The household may vary with circumstances, e.g. among rich versus poor as also with the period,

i.e. "crisis" versus "normal" situations. If the unit of analysis, i.e. the household is itself a "moving target" in terms of composition, structure, overall productive capability and consumption requirements, one needs to identify household characteristics within the model. (We are still assuming the possibility of being able to identify "households").

The first characteristic is household size. This depends on living arrangements, whether families are nuclear, joint, extended, single parent or individual. It also rests on fertility patterns and the associated stage of the family life cycle. Whereas in the short run, the number of members may be taken as given, in the longer run this can be endogenous to the system e.g. changes in fertility or mortality. Migration can also effectively alter the size of the household. A priori the case in favour of a larger household is based on an economies of scale argument which allows for risk spreading through greater diversification. Most evidence from India indicates that household size rises with income classes, but among the poor it is those in larger families who may be found to be the poorest.

The second feature which is closely related is the dependency ratio i.e. the ratio of working to non-working members. This may be more important than size in determining possible economic responses to risk. Dependents may be the very old or the very young. A priori the presence of both may raise insecurity but while the aged are a permanent liability, the young if they survive are expected to contribute to the family income. However, while the question of retired and old aged people is given importance in the discussion of security in developed countries, it is less so in developing economies where there are fewer old people among the poor due to low life expectancy, and also because the aged may continue to contribute in some way until death.

Disability alters the picture in a significant way. We should distinguish between permanent and temporary disability. Which member of the household is affected by disabilities is next in importance. For example, a sudden sickness of an adult working member of the household can lead to a definite collapse in living standards. We wish to emphasize this because most programs of rural employment ignore those who may not be able to participate in the first place when burdened with some form of disability, temporary or permanent.

A neglected variable in most of the literature yet crucial to our problem is the sex ratio or sex composition of the household. If women are discriminated against, then the proportion of adult men to women in a household becomes important. The ratio of boys to girls may also be important for different reasons, e.g. discrimination in food.[9] Discrimination against women in the labour market is well documented and the prevalence of a segmented labour market for men and women accepted. Composition of the household by sex will thus determine its access to resources, markets and income-earning opportunities.

Before discussing the difference in opportunities for men and women in the labour market we shall briefly dwell on other social legal and political features which influence the household's opportunities.[10] For instance the relationship of women to territory and property is of significance.[11] None of India's legal systems recognize the wife as joint owner of property acquired during marriage, and laws governing women's inheritance rights are still discriminatory. Access to land is thus restricted for women. This may not be critical for labour households but there can also be discrimination in the access to other resources such as credit, either if their participation in cooperative credit organizations and the like is restricted or if patron-client ties which provide loans are

prevalent only among male workers. For instance, Cain[12] argues that in Bangladesh there exists such a rigid division of labour by sex that women (by their sex per se) are at a high risk of abrupt declines in their economic status (reflected in a high degree of loss of land among women headed households). Similarly in terms of territory or social space, each society is likely to have zones of publicness, whether made explicit or not, where women can or cannot participate freely.

Coming back to the labour market, since the crux is the earning capacity, the absolute discrimination observed in the wage rates may be reflective of the relative discrimination in terms of social status.[13] More specifically, participation in the labour market may be restricted by the sex typing of jobs: for example transplanting is done mostly by women but mechanical operators for transplanting are now operated by men. Sex specificity of jobs existed in traditional occupations but may be worsening for women with modernisation and technological change.[14] To take another example, where payments are based on time, the introduction of time saving devices in women's traditional tasks lowers their income. Male tasks are paid more often on the basis of acreage rather than time. With both functional and physical restraints on them, the economic mobility of women is likely to be lowered. Another example of segregation comes from Kerala where in brickmaking, women are confined to the strenuous task of carting bricks and never earn more that Rs5 a day and where men can expect to make Rs10 a day or more (Gulati). Wage payments are made on a piece-rate basis and the men's tasks i.e. kneading, moulding, stacking are better paid than women are for head load carrying. In terms of risk and adjustments to them, women face different problems, the pattern of their work over the life cycle being unlike that of men, with a differential impact of seasonality resulting in wage and

employment variation which differs from that facing men(see Chapter 4). To the extent that conditions may be more unfavourable to women, the exact sex composition of the household becomes critical.

We have just provided a glimpse of the kind of issues which enter with the concern for the study of women.

The existence of skills and education are important characteristics, the former being more relevant in this context.[15] Traditionally, rural areas were characterized by individuals or families with a high degree of task specialization. Along with sex differences in the acquisition and presence of skills (e.g. as in father to son taught skills), there are likely to be strong caste distinctions. In the Indian social context even in present times, caste plays a major role. The caste characteristic of the household may determine its opportunities in the market, more so when linked with the associated skills. A distinction should be drawn here between belonging to the untouchable or scheduled castes and to other lower castes in the hierarchy, there being more constraints on the former.[16]

2.3

We have so far outlined features of household structure which need to be incorporated into an analysis of vulnerability of labour households. The problem we are faced with is how to incorporate this structure into economic models. A very simple first approach would be to divide households into types by grouping their characteristics and then possibly attempt to pick the typical household(s) as those which are most represented in the population. Profile studies i.e. using a mixture of quantitative and qualitative information can provide useful insights. Use of a structured sample could highlight the differences caused by household structure but a case study approach would throw

more light on mechanisms of adjustment and differing constraints to participation in the labour market. Even a small sample case study could illuminate the role of household structure.[17]

Another approach could be to consider labour power as a vector of endowments (as say male, female and child labour or even as a matrix, to be discussed in more detail in the next chapter in the context of the exchange entitlement approach, refer section 3.26).

Responses of a household will be determined by the options available to it and hence we can try and relate household structure directly to vulnerability by hypothesizing how adjustment mechanisms are determined by household structure, as also how adjustments may be made through changes in household structure itself. We present below a matrix illustrating the effects of household structure on ability to adjust to risks. It is based on hypotheses about qualitative responses to shock. The timing of adjustment is ignored at present i.e. whether adjustments are made before, during or after a crisis. This relates to what variables one assumes as constants. Ideally the distinction between intra-household and inter-household adjustments should also be made with variables like dependency strongly influencing intra-household changes and caste affecting inter-household exchange. Finally, a distinction should be drawn between individual and general shocks. The former case is likely to present a less grim picture since all other households but the one affected may be in a position to help the distressed one. On the other hand, an extended family may help the given household tide over a personal crisis but be of less help when the entire economy suffers a shock.

In the table presented below the answer to most responses can be ambiguous when a region is not specified, though the hypotheses about factors which are likely to operate is partially backed by the existing literature. Instead of a critical cut off point, most of the

variables are specified on a range.

Adjustments to Risks

		Types of Risk	
		Random	Seasonal
Household structure (Characteristics)			
1. Family type:	1 Nuclear	?	-
	2 Extended	+	+
	3 Female headed	-	-
Size and Composition:			
2. Total size	(getting large)	?	+
3. Dependents	(increasing dependency)	-	-
4. Age structure	(young/old) more young	?	-
5. Femaleness	(sex ratio i.e. higher female/male proportion)	-	-
6. Disability	permanent	-	-
	temporary	-	-
7. Skills		?	+
8. Education		?	?
9. Caste	(if lower)	?	-

+ = better ability to adjust, - = lower ability to adjust

? = ambiguous direction

In terms of stability analysis, if the presence of a trait is associated with the positive sign i.e. better ability to adjust then the household may be expected to be able to recover from a shock while a negative association of a trait may make the position destabilising. For instance, assuming given household characteristics, the above table indicates that a nuclear family may be a drawback in responses

to seasonality, if fuller participation in the peak demand period is restricted as is diversification in the slack period. For random events, the effect of nuclear families is ambiguous. There is evidence in India that shows that many of the poor (rural and urban) have always been in nuclear families. One reason for this could be less incentive for staying in an extended household where inheritance is not of any significance i.e. where level of 'heritable assets' is low, even absent.

Female headed households being at a distinct disadvantage in risky situations is supported by several studies e.g. constraints which lower their mobility (Cain 1979). The effects of household size depend on the degree to which the economies of scale argument is valid. Without other productive assets (akin to fixed capital in production theory) the scale argument may not be relevant, or if they lack skills for diversification, poor households gain little advantage from having more members. They may however be able to spread risks by taking more advantage of seasonal labour demand, and economies of scale in consumption.

Going down the line, more dependents, especially the presence of young dependents may hamper adjustment. Discrimination both socially and in the labour market if assumed will imply that femaleness has a negative effect on responses. Presence of disabled members raises the number of dependents and also involves extra costs both in terms of money and time spent in their care. Although we suggest that existence of skills can be beneficial to a household, this will depend on the kind of skills, it being more difficult for some skills to regain income opportunities than others like artisans versus those with mechanical skills. Education may help in migration as a response to collective risks. Ceteris paribus, belonging to a lower caste especially scheduled caste reduces the choice of opportunities open to

households through which they can survive a downfall, it makes their opportunity set narrower and poorer.

2.4

If structural changes, i.e. in the composition of the household are allowed, a variable which has wide ranging implications on household structure, responses and income is migration. Migration is determined by the structure of a household but also determines it in turn. It can allow quick changes through temporary or seasonal migration or be part of a longer run adaptive strategy. Migration may be rural-rural or rural-urban in response to different phenomena.[18] Migration is a complex process but we mention it to pinpoint that it is a channel through which the position of a household can be altered through possibilities for migration itself depend on the initial structure of the household, e.g. it is easier for some adults to seek jobs elsewhere in a household which has several adults.[19] Migration can also be explained as a strategy of risk minimisation through the diversification of a household's income portfolio when some members migrate to urban areas.[19]

Fertility is another key variable in determining adjustment responses through household structure. To what extent reproductive behaviour is part of a strategy of long run risk minimization is not well documented but the link acknowledged. In the absence of external security provision, maximizing size (maybe only of sons especially in the Asian context) could be a provision, both for old age security (i.e. life cycle changes) and security against general risks. Therefore, determination of family size (number of children, their timing and spacing) has to be viewed in the overall context of the relation between household structure and vulnerability. For example, increased fertility may be part of a strategy of risk minimization

where household labour is important and children provide significant economic returns and where a replacement head of household may be required in periods of crisis.[21]

2.5

Finally one needs empirical evidence to determine the importance of household structure on vulnerability. One method is to set up a limited dependent variable model with expected determinants of vulnerability.[22] If V is the index of vulnerability, and V = F(X), where X is the set of independent variables, let V = 1 if households belong to vulnerable group and = 0 otherwise.

This model casts vulnerability as an all-or-nothing phenomena, and may be considered a first approximation only at modelling its determinants. It uses an endogenous specification for V i.e. an index based on some of the determinants.

The setting up of an index for measurement of vulnerability faces several problems. First one has to decide whether to base it on one variable only e.g. income or to use a composite index. For each variable, one needs a threshold level falling below which determines vulnerability. To aggregate these thresholds for several variables is a near impossible task e.g. one may have different indicators for a nutritional shortfall (calories) versus a health shortfall. The simplest option may be to construct indices for different variables separately (as discussed in Chapter 1).

If one chooses income as an indicator, again the first problem is the non-uniqueness of a threshold, which becomes evident from the discussion on poverty measurement in the previous chapter. To identify those vulnerable to sharp income shortfalls one may take a weighted average of mean incomes and some meaure of variance (the coefficient of variation and preferably only the downward variations).

The other way is to have a probability based measure using indivudal's subjective estimates or an expost relative frequency measure. Vulnerability to more than one variable could be aggregated through a joint probability distribution function.

In a broader framework, we can begin by making V dependent on household characteristics, and income earning opportunities in the labour market including institutional features.

Let $V_j = f(H_j, D_j, M_j, A_j, N_j, K_j, W_j, VIL_j, S_j, Y_j)$ for jth household

Where
- H = size of household
- D = dependency ratio
- M = sex ratio/femaleness
- A = value of assets
- N = days of employment
- K = proportion of payment in kind
- W = wage rate
- VIL = village dummy (area specific)
- S = season dummy
- Y = year dummy

The qualitative relationship between the independent variables and vulnerability can be suggested by specifying the expected sign of coefficients. If a positive sign indicates that the prsence of the variable or a higher value of it is likely to raise the probability of being vulnerable, we have:

		Expected sign on vulnerability
H	for larger size	-
D	for higher dependency	+
M	higher femaleness	+
A	more assets	-
N	less unemployment	-
K	higher prroportion of wages in kind	-
W	higher wages	-
VIL	if more risk prone area	+
Y	if unfavourable year	+
S	if off season	+

An econometric estimation of this model of vulnerability can be undertaken using a probit model which views vulnerability as an all or nothing decision conditioned on a threshold level.

In a probit model vulnerability would be defined as

$$V = 1 \quad \text{if } T_j < T^*$$

$$= 0 \text{ otherwise}$$

where T^* is the threshold level. The stimulus index T is determined as linear combination of the explanatory variables for simplicity and T^* assumed to be distributed normally (0,1). A non-linear specification could model interactions between the variables. The conditional probability for a given level of T is given from the cumulative normal probability function as

$$P(V = 1/T) = P(T^* > T) = \frac{1}{2\Pi} \int_{-\alpha}^{T=y} e^{-u^2/2} du$$

where $y = b_0 + b_1 x_1 + \ldots\ldots b_w x_n$

By choosing a specification for V, we can interpret the model by looking at the consistency of signs of estimated coefficients and significance of asymptotic t values. Size of values of the likelihood ratio test will show the importance of the independent variables in accounting for vulnerability. Predicted probabilities can be estimated based on probit coefficients to gauge the relative strength of the dependent variables.

Due to insufficient data at present, the probit model is not tested in this paper. This would require information on household composition over time, and at the time of events leading to vulnerability. To be able to distinguish any causality or even association, data on all the variables mentioned should be available for the entire time period under study.

Footnotes:

1. Jodha (1978).

2. Interestingly Cain (1981) in a study on villages in Bangladesh and India finds that sale of land or debt due to expenses of marriage and other social functions are cited as a reason only by richer farmers.

3. Jodha (1975).

4. This estimate based on NSS data is provided by Vaidyanathan, who also points out that the incidence of wage labour is higher in India than in most of South-east Asia.

5. See Poverty and landlessness in Asia (ILO).

6. Sen (1983) has shown that the treatment of decision making by the family is as yet in an unsatisfactory stage in economic theory.

7. The Greek word epistion for family, means literally "that which is near a hearth".

8. A.V. Chayanov (1966) The theory of peasant economy, translated and edited by D. Thorner, R.E.P. Smith and B. Kerblay, Irwin.

9. Child labour is also quite important in most of rural India.

10. One may need to distinguish female headed households, and the opportunities they face, if found to be statistically important in the sample.

11. See U. Sharma for a description of this.

12. Cain (1979).

13. B. Miller has argued that where females are more important in rural production, they are less subject to female segregation and seclusion.

14. Changing technology as a determinant of vulnerability is being ignored for the present. B. Agarwal and other papers presented at the 'Women in rice farming systems' conference September 1983 at I.R.R.I., Los Banos, Phillipines discuss the impact of Technology on women.

15. Both skills and education are found to be determinants of migration (Todaro) though investment in education can be risky if the probability of getting a well paid job is low.

16. The positive discrimination in favour of these castes in job reservation and higher education does not alter the position in rural labour markets.

17. Some social scientists have documented the struggle of the poor against differing odds. One such study being Sicilian Lives by Donilo Dolci, Writers and Readers Publishing Cooperative, London, 1981.

18. Rural-rural migration is on a much larger scale than rural-urban migration in India.

19. Migration involves some costs and hence it may not be the poorest who migrate first. See Banerji and Kanbur. Also while landless families may migrate together, only some members of a landowning family may migrate at a time (K. Bardhan).

20. O. Stark and Levhari argue that this is so in the presence of risk and inadequate insurance markets.

21. Mead Cain (1979) and (1981) provides explanations of risk as a source of derived demand for children.

22. See Maddala (1983) and Amemiya (1981).

CHAPTER THREE

Market Adjustment Mechanisms

3.0

In this chapter we look at mechanisms for adjustment to shocks in the realm of credit and labour markets. These two markets are chosen for their crucial significance to 'labour' households suffering a deterioration in conditions. We begin with the credit market. Questions are: what adjustments do credit markets permit? How can they be distorted, and act as destabilizing forces? The second part looks at the labour market in greater depth, at uncertainty on both supply and demand side of the market and responses to it in terms of behavioural (decision making) theories as well as through institutional arrangements such as contracts which have developed in response to it. The discussion of the labour market is more general, including certain types of risk within it such as unemployment. First, theories in the neoclassical paradigm are discussed (section 3.22) followed by security based theories (3.23), the bargaining approach (3.24) and finally expanding on the entitlement approach (3.26) which can combine several aspects of the discussion in one framework.

3.1 Credit Market:

The credit market is an important source for adjustments, helping to even out payments and receipts. In neoclassical theory, risks or shocks are incorporated by considering an individual's life cycle, consumption expenditures being balanced with permanent income.[1] The permanent income hypothesis seeks to explain consumption behaviour in a multi-period framework by assuming that individuals base their consumption on permanent income i.e. the flow associated with wealth

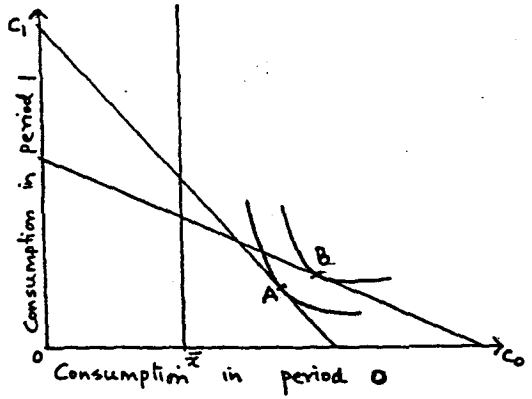
over a life time.

The optimal consumption is determined making the usual neoclassicl assumption of perfect markets and parametric prices. The budget constraint in any period can be constructed as.

$A_t = (1+r_t)\, A_{t-1} + Y_t - P_t q_t - V_t\,(S_t - (1-d)\, S_{t-1})$

where A_t = value of financial assets in period t, Y_t = rate of intrest, $Y_t - P_t q_t$ = current savings i.e. income - consumption, and $d_t = S_t - (1-d)S_{t-1}$ = change in stocks. However, the optimal inter-temporal consumption plan over a life time as envisaged by this (i.e. based on discounted future income) may not be attained if certain liquidity constraints are introduced, as for example a constraint on borrowing or on sales.

In a simple diagram, the effect of a sales/borrowing constraint is represented:

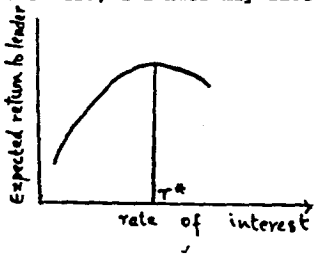


The equilibrium is at A when the borrowing constraint is operative and could have been at B otherwise, showing a definite loss in utility in the presence of a constraint. Adjustments are thus dampened by the existence of some constraints.

The analogy with vulnerability is close. If credit is essential in evening out the cash flow, a binding constraint can cause a sharp

drop in consumption and welfare. A household with little or no savings, is heavily reliant on access to outside resources for adjustments. Failure of insurance markets and imperfections in financial markets are reasons for greater instability (this means that we are no longer in an Arrow-Debreu world of perfect and complete state contingent markets). One can view credit performing two roles, one evening out income and expenditure, assisting in saving-investment i.e. traditional functions of financial markets and second in providing insurance in adjusting to risks. The second relates to the consequences of default, which is discussed a bit further on.

When a household encounters a shock which leads to heavy losses, its ability to adjust depends on the terms and conditions under which exchange is possible. If there is a borrowing constraint either due to a total quantity shortage and hence rationing, or due to preferential treatment of borrowers (e.g. bias against people who lack collateral), then the scope for adjustment is restricted. It has been shown that credit rationing can occur in a state of equilibrium, if there exist constraints in the economy.[2] In the presence of risk, given imperfect information about borrowers, the rate of interest may be a device sorting potential borrowers and at the same time affecting actions by borrowers i.e. the "adverse selection" effect and "incentive effect". One can thus have a two price equilibrium e.g. a low rate by banks alongside a high rate by moneylenders. When the interest rate is being used as a screening device for potential borrowers, a lender may face the following curve,



with the equilibrium r^* reflecting a state with excess demand for loans. Constraints can be operative both in terms of quantity i.e. rationing, and in terms of price at which loans may be taken. Similarly on the sales side, there may be constraints facing a household. For example, the market for assets may collapse under a shock. The "distress sales" made in drought periods (especially of livestock) at unfavourable prices for the seller are an example of the failure of adjustment mechanisms. The smoothing out of consumption (i.e. stable real consumption) as envisaged by the permanent income and life cycle hypotheses is prevented with the introduction of constraints.

Seasonality being a recurrent fluctuation, one may expect households to plan expenditures to match seasonal movements. When a seasonal slack period leads to a "crisis", it reflects the inability to make full adjustment either due to a lack of accumulated resources[3] or the inefficiency of adjustment mechanisms.

Risk itself can be a reason for inefficiency in the credit market leading to a less than desired allocation of credit.[4] On the lenders' side, risk is greater because of the bunching of defaults, given localized lending and covariance of local activities. For borrowers inefficiency can arise due to lack of information, initially high background risks and the need for consumption credit rather than productive loans. On the other, it has also been argued that when lenders insist on collateral requirements as the amount borrowed increases, it effectively shifts the risk of capital loss to the borrower, hence raising his incentive to repay. In such cases, the penalty for default is very high and may even result in a life long exclusion from the capital market. The cost of borrowing rises when this extra risk from loss of collateral is included and may result in the disappearance of the credit market (for borrowers) from the demand

side i.e. when the full cost of the loans is greater than the benefits from its use.[5] The credit market may also disappear from the supply side (as discussed earlier) for those who do not have assets which are acceptable as collateral. A sudden decline in a household's assets is a loss in itself and also harmful as it could shift the terms of credit availability against the household. Introducing contingency contracts into the credit market whereby a termination of the relationship is possible e.g. denial of future loans to defaulters leads lenders (or employers) to either charge a higher rate of interest in the second period to defaulters or build in a clause terminating future transactions. In both cases the first period interest rate is higher than without this linking between periods. The loan contract is fully characterised as

$$C = (r_1, r_2, r_2^f, ps, pf)$$

where r_1 = first period interest rate

r_2 = second period interest rate if first loan repaid and r_2^f if not repaid with ps being probability of a second loan when first repaid and pf after default on first loan.[6]

The credit market plays a role both in the maintenance of present consumption during a crisis and in the post-crisis period in the recuperation of resources. Informal lenders are found to be more dominant in such periods, mainly because of their flexibility (in terms of rates of interest, number of instalments etc.). Borrowers are also found to prefer loans from informal lenders which may be taken in kind, in order to minimize the risk of not finding required goods in the market during the scarcity period and also for other reasons such as easier access, flexibility, timeliness. Additional costs involved in transport, waiting, bribes, even loss of a day's work can raise the

effective cost of borrowing from formal agencies. Further the access of formal credit to landless labourers is very limited anyway. The role of credit in the adjustment process is brought out in the following table:

Credit received by drought affected households during drought year and post drought year in two drought-prone areas of India

Particulars	Barmer (Rajasthan)		Sholapur (Maharashtra)	
	69-70	70-71	72-73	73-74
Amount of credit Average per household (Rs)	384	262	231	137
% share of agencies				
Institutional	7.7	5.3	55.1	83.8
money lender	22.8	40.5	2.2	3.1
trader	61.4	37.3	NA	NA
larger farmers	2.4	6.5	24.3	3.5
relatives	5.7	10.4	18.4	9.6
% share of purposes of credit				
current production	15.5	27.3	31.1	32.8
capital investment	3.0	--	16.5	49.3
current consumption	81.5	72.7	52.4	17.9
proportion of kind loans	76.0	52.1	48	16.8

Source: Jodha (1975)

This table shows a substantial amount of debt in drought and post-drought years, with a large share going to current consumption in the drought year and more to production and investment in the post-drought year. Institutional lenders are quite important in Sholapur, but have a very small share in Barmer.

The above picture hides much of what may be going on, for example the acquisition of assets by lenders during drought periods, or interaction of lending with labour services. There does seem to be a strong case for altering the functioning of formal credit agencies to help in adjustment to risk, e.g. in risk shifting or in diversification of income.

3.2 Labour Market:

We begin by looking at the operation of rural labour markets, and their characteristics, going on to consider the factors making labour households more vulnerable, e.g. is it due to inefficiencies in the functioning of the labour market. A framework is needed which 1) captures characteristics of rural labour markets 2) incorporates household structure and other determinants of vulnerability and 3) explains responses and adjustments to shocks. We begin by looking at some of the criteria for decision making under risk in labour markets, and their inapplicability to our concerns which centres not so much on the results of decision making as the impact of risk on a household's position. A look at an alternative approach using game theoretic concepts to explain the provision of security follows. Then, a discussion of the feasibility of the entitlement approach as a framework in which to study these issues.

3.21 Features of rural labour markets:

The first feature one notices is dualism in the modes of employment, as wage labour (hired) coexists with family labour (unpaid).[7] The wage labour market does not display the same features as competitive urban markets. Competitive assumptions are violated both by the extent of market penetration, i.e. degree of monetisation and by the character of markets.[8] For instance, imperfections in the markets may reveal themselves in varying degrees of monopoly and associated strengths of bargaining power. Physical and social constraints may limit mobility of factors and imperfections in information and coordination make rural labour markets fragmented.[9] Further, there is a complexity to market relations through the

interlinking of several markets, and of price and non-price relations. Rural labour markets are surrounded by a richness of institutional forms, e.g. multiple modes of production. Male and female labour markets are usually segregated.[10]

The economy is further characterised as one with surplus labour, without quibbling about its definition, one can assume that India is a country with the twin problems of unemployment and low productivity. With rising population and labour force, there is not sufficient land to distribute to all, even if it were feasible to do so. This does not rule out shortages of labour occurring in certain seasons or regions although it is more likely that individuals may be unemployed, i.e. rationed in the labour market.

3.21

Introducing risk will have an impact on both the supply and demand side of the labour market, with different implications in terms of price versus quantity variations but eventually household income will be determined by changes in the equilibrium position. Different theories of decision making under risk are viewed from the perspective of maintaining the stability of the position. In analyzing different models it is important to know what assumptions are made by each with respect to the structure of markets, institutional features and endogeneity/exogeneity of variables. The discussion falls into two broad groups: one the theories associated with the neoclassical paradigm and second the lexicographic or security based theories.

3.22

In the absence of risk, the neoclassical theory derives labour supply in a utility maximisation model, and similarly labour demand by profit maximization subject to constraints.

This framework is inappropriate for the study of rural labour markets, because issues differ e.g. the participation decision may be determined by external constraints rather than by household choice. In empirical work, these systems have usually been specified in terms of a loglinear or linear expenditure system which impose severe restrictions on the elasticities.[11]

Some useful extensions can be made to this basic model. For example the unemployment issue is introduced by specifying two effects on a worker's participation decision: 1) the "added worker" effect where when the primary worker is out of work the secondary worker may seek work more because of a negative income effect, and 2) the "discouraged worker" effect which works in the opposite direction i.e. loss of interest in job search when unemployed. This brings in some factors affecting supply of labour by different members of the same household, in a surplus labour situation.

Most of these models however do not distinguish between individual and household rationality. The only way some distinctions within a household have been introduced is by distinguishing types of workers, i.e. a multi-person family. The utility function can then be written as:

$U = U(q_{O}1, q_{O}2, q)$ for individuals 1 and 2 e.g. male and female $q_{O}1$ and $q_{O}2$ are leisure consumptions of 1 and 2 and q is a vector of consumption goods

For example, Rosenzweig[12] uses a specification which distinguishes sex, i.e. male and female labour for each household, with different wage rates for the two kinds of labour. The budget constraint then is

$$pq + W^1 q_{O}1 + W^2 q_{O}2 = V + W^1 T^1 + W^2 T^2$$

where W^1, W^2 = male and female wage rates, respectively

T^1, T^2 = male and female time endowments, respectively

V = unearned income

pq = value of consumption of commodities

From here two sets of labour supply functions can be estimated. Other characteristics like education can be introduced, but remain exogenous. If a vector of household variables is to be made endogenous in the utility function, it will need associated prices in the budget constraint. More work in general is needed on household determinants of labour supply.

Some limitations of the neoclassical approach will be briefly mentioned. The behavioural assumption made is one of individual utility maximization, whereas households may be guided by alternative objective functions which portray satisficing behaviour, i.e. bounded rationality or even do away with utility functions altogether using a target approach (e.g. an income target or the starvation set as in Sen 1982). Along with the assumption of utility maximization is the implicit one of "rational" behaviour on the part of individuals. Although in the new household economics models multiperson households are introduced, the meaning of rationality is left unchanged.

The features of rural labour markets are not incorporated satisfactorily. As mentioned earlier, the markets may not be functioning "perfectly" showing lack of complete wage and price flexibility. Institutional and structural features affecting the market are too often ignored. For instance, prevalence of contracts or patron-client relations is left out of these theories. We are

arguing that wages and prices though endogenous may not be completely flexible as envisaged by these theorists.

Behaviour in labour markets in developing countries is often explained by the other extreme of a totally rigid wage with an unlimited supply of labour at that wage. The fixed wage rate may be based on institutional features a la Lewis or nutritional requirements.

The efficiency wage hypothesis seeks to provide an explanation for a constant, positive wage rate in the presence of unemployment, the employer finding it profitable to pay a higher wage which raises productivity of the worker.[13] Evidence however contradicts this as wages do reflect change in demand, and in unemployment (varying across villages, seasons). An observed lack of permanent contracts wherein productivity effects may be reflected, also goes against the theory.[14]

On the supply side, estimated elasticities of labour supply with respect to wages in rural India are found to be low, emphasizing the role of social and demographic factors such as number of dependents, caste, assets, season, agricultural development index.[15] For example, higher age and more per capita land cultivated by the household tend to lower hiring out of labour while a larger number of dependents per earner has the reverse effect.

Risk can be introduced within the same framework, in the form of additive or multiplicative shifts on the supply or demand side of the market.[16] First looking at the demand for labour, it will depend on shifts on the production side, for example, technological change, climatic variations, cyclical changes. The simplest type of pure supply risk can be introduced either as $q = \theta f(x)$ a multiplicative shift in output with $E\theta = 1$, $V\theta = r^2$ or $q = f(x) + \theta$, an additive shift with $E\theta = 0$, $Var\theta = r^2$. (Assuming a normal distribution of the random variable is to be seen as a special case.) The

multiplicative shift alters the slope of the production function while the additive one changes the intercept. To make a simplifying assumption, if the element of risk gets transferred into prices then producers are assumed to maximize expected profits.

If expected value of prices = $\hat{p}$ risk neutral producers maximize $Ey = \hat{p}\ f(x) - wx$ where $\hat{p}$ is the certainty equivalent price and $f(x)$ is the production function over the vector of inputs x with associated costs w.

$$\hat{p} = \bar{p} + \text{Cov}\ \frac{(p,q)}{q}$$

The extent of price fluctuation depends on the correlation between price and output, and the demand for labour is affected through this price. If direct variation in supply is assumed, then factor demand can be influenced through

$$p\ \bar{\theta}\ \frac{\partial f}{\partial x_i} = w_i$$

Assuming producers choose output so as to equate expected price to marginal cost, the direct impact on labour through shifts in the production set can be estimated. The demand for labour will vary depending on the type of shift, the extent of shift in price versus output, substitutability between labour and other factors, price vis a vis wage changes and finally institutional constraints such as contract labour. Risk-averse producers choose the optimal amount of labour by maximizing expected utility i.e.

$$EU = \left[\tilde{p}\tilde{\theta}f(x)\right] - wx \quad \text{to give} \quad EU' \ (\tilde{y})\tilde{p}\tilde{\theta} = w_i$$

A change in wages at the same time as production changes may serve to insulate employment. The effect of random disturbances on labour income depends on the correlation between wages and employment. For instance if $Y = W.\ell$ where ℓ = days of employment, W =

wage rate, Variance Y = Var(W) + Var(ℓ) + 2Cov(W,ℓ) if variables are in logarithmic form. Assuming a fixed supply, covariance between wage and employment will depend on the elasticity of the demand curve. If a constant elasticity function is assumed like $W = \ell^{-1/\varepsilon}$ then Var(y) $= (1 - 1/\varepsilon)^2$ Varℓ. If $\varepsilon = 1$ i.e. a rectangular hyperbola, income will always stay constant and variance equal zero.

Considering a policy such as wage stabilization in isolation will not be of much use in such a situation, since its impact on employment may go in either direction, depending on the characteristics of the labour market. The point is well taken that price stabilization in itself may be undesirable if it increases income instability[17] especially since it is total earnings which are of concern.

Also the source of variability needs to be correctly known. The discussion so far has ignored the distribution effects, i.e. whether agents benefit from a price stabilization depends on the source of the variation, as also the correlation of an individual's output variation with the average change. For example, if instability is due to demand disturbances, price stabilization will decrease the level of earnings below what they would be in an unrestricted market and stabilize earnings if demand is sufficiently price-inelastic (for producers). If instability is caused on the supply side, price stabilization will increase the level of earnings and stabilize earnings fluctuation if both supply and demand are sufficiently price-inelastic.[18]

To go from here to the welfare of labourers requires looking at the utility function, which would be a function of the real income (W.ℓ)/p, and the probability distribution. This requires specification of responses to all three parameters (i.e. certainty equivalent for each).

Though the impact of alternative policies (e.g. wage or price or employment stabilization) can be studied in this framework, the partial equilibrium approach is inadequate as it looks at response of individuals to specific shifts without looking at how it changes their overall position (or their vulnerability) and the distributional effects within the economy.

On the supply side, with the introduction of risk, workers may maximize expected utility in determining their supply of labour. If income $Y = w.\ell + y_0$ where y_0 is non-labour income. When y_0 is uncertain, indivudals

$$\text{Max } EU \int_R U(L, w\ell + y_0)\, f(y_0)\, dy_0$$

where R is the range and $f(y_0)$ is the probability distribution function of y_0. If workers are risk averse, an increase in uncertainty of y_0, is likely to raise the amount of labour supplied. (Assumptions $U_1 < 0$, $U_2 > 0$, $U_{22} < 0$ and risk aversion $R_1 = 0$, $R_2 < 0$ i.e. absolute risk aversion declining as income rises.)[19] Similarly one could assume uncertainty in the wage rate, then workers

$$\text{Max } EU \int_R U(L, W\ell + y_0)\, f(w)\, dw$$

where f(w) is the probability distribution function of the wage rate. $[EU_1 + E(WU_2) = 0$, $EU_{11} + 2E(WU_{12}) + E(W^2U_{22}) < 0$ are conditions of equilibrium.] There are two effects on labour supply, an "uncertainty substitution" effect which will be negative for a risk averter and an "income uncertainty" effect which is likely to be positive, the total effect being ambiguous. For example if seasonal variability causes large wage fluctuations, it may lead to a decline or rise in participation depending on the stronger effect. This kind of model has been extended to include optimal consumption and saving decisions in the face of uncertainty, but requires stringent assumptions on the utility function to derive predictable results.[20]

So far the impact on behavioural responses in rural labour markets has assumed that subsistence is ensured. Not considering the possibility of real income being less than a social subsistence, is inadequate in the discussion of adjustment. Further, this argument has been assuming that all labour supplied is accepted. If quantity (accepted) uncertainty is introduced, the impact will be different both on the supply of labour and on overall labour income.

What is more relevant to workers is demand side uncertainty, both in terms of price (low wages) and quantity (unemployment). Another major criticism of this approach is the nature of restriction imposed on the motives of the agents. Expected utility or profit maximization may be considered possible in an as-if approach to behaviour, if predictions are correct but it takes too narrow a view of individual responses. The earlier approach also ignores all decision costs. In order to convert stochastic processes into certainty equivalents the utility function is usually specified to be twice differentiable (i.e. to get income-risk tradeoffs).[21]

In an analysis of shocks leading to vulnerability, there may not be definite choices among activities as degrees of risk vary and also the possibility of having discrete choices available.[22] Therefore, these decision-making models are not very useful. These approaches also do not distinguish between behaviour before, during and after a crisis, and therefore, do not help in identifying different mechanisms of adjustment to risk (i.e. the issue of timing). The entire approach is ex-ante i.e. how an individual should behave (optimally) to accommodate risks. Risks felt through the market are captured here but the impact on other non market variables e.g. health is not brought in.

Another way to approach the labour endowment from the supply side is by considering the labour utilization identity[23], not just in a

static form but by analysing sources of variation. The identity can be written as:

$$\frac{\text{Income}}{\text{Persons}} = \frac{\text{working age persons}}{\text{Persons}} \times \frac{\text{workforce participants}}{\text{working age}} \times \frac{\text{hours worked}}{\text{work force}} \times \frac{\text{Income}}{\text{hours worked}}$$

(a) (b) (c) (d)

The first two variables on the right hand side get determined by demographic features and age and sex specific participation rates. The third variable (c) gives the duration of labour while the last (d) reflects rewards or wage payments. Variability in income per persons and in their instability can be traced back to variations in each of these components. These may vary in a manner reinforcing each in having a negative effect on income per person. Those vulnerable (to an income shortfall) are likely to be households with a younger age-structure (which affects a), with members prone to illness (which affects b), which in turn may influence the intensity or duration of work. The last variable i.e. wages which is not directly under the control of the household may vary in a manner enhancing instability (see wage and employment fluctuations in Appendix 2,3).

The effect of sickness on labour supply needs to be emphasised once again. Those vulnerable to illness are likely to be vulnerable to starvation, death as through the sequence of illness and non-participation mentioned earlier. The magnitude of the problem can be gauged from National Sample Survey data on India which shows that in 1977/78 illness related absence from work lowered labour input of men by 5% and of women by 6% in rural India. A further loss of at least 1% of the work force can be attributed to chronic disability.

Although some poor households may prefer high participation rates they may find them costly or unattainable (and hence the greater likelihood of their position being unstable). For example some illness can prevent participation while others can cause discomfort, pain and lower returns to work.

In terms of the adjustment responses discussed earlier, the influence of differing household composition, and of constraints operating through the credit market can be seen as impinging on the quantitative and qualitative response of labour supply.[24]

3.23

We shall now look at some alternative approaches to determining behaviour under risk. The strongest competitor to the expected utility approach is the safety-first or security based theories. The need for "security" becoming a primary motive and determinant of indivudal behaviour can be a good representation for behaviour of very poor households. (Models which propose other modes of behaviour, e.g. Cancian[25] who suggests that farmers aim to maximise their rank in the community and therefore poorer farmers who have less to lose may gamble more assume in the background a social system where individuals are saved from starvation.)

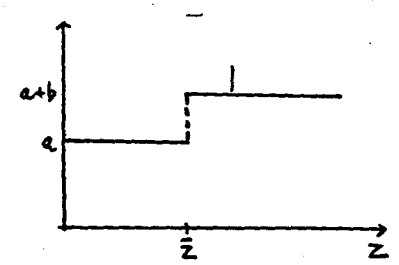
A safety-first goal can be a good way of studying the behaviour of vulnerable households. One could distinguish between responses to risk 1) when subsistence is at risk and 2) when subsistence is assured.[26] The strict categorization of the population as risk-neutral or risk-averters may be counter-productive, because disaster levels will vary across individuals. The prevalence of a range of low incomes that different farmers have learned to accept and were prepared to accept[27] shows that individuals may now order alternatives not by variance of income but by risk where risk equals

probability tht returns fall below some disaster level of income, with disaster levels varying. The concept of certainty equivalents is then no longer applicable. While bringing in the possibility of a kink in behaviour between the vulnerable and the not-vulnerable, the security based approach may be able to differentiate between the poor and the vulnerable, e.g. the poor may in some cases be found to be risk loving, say gamble but not so the vulnerable, if the poor have some mechanisms through which subsistence is ensured.

In a lexicographic safety first model the individual maximizes an objective function subject to a chance constraint as follows: (This combines safety principles with a lexicographic ordering.) Probability $(\Pi(x) < \bar{d}) \leq \bar{\alpha}$ where probability of profits or income falling below the disaster level $\bar{d}$ is constrained by the confidence level $\bar{\alpha}$ or in terms of cumulative frequency $F_X(\bar{d}) \leq \bar{\alpha}$. If it is important to what extent you fall below the target, we can use minimise $F_X^{-1}(\bar{\alpha})$. Safety first can be partially reconciled with Von Neumann type axioms if the utility function takes the form:

$$U(x) = \begin{cases} a & \text{if } z \leq \bar{z} \\ a+b & \text{if } z > \bar{z} \end{cases} \qquad \bar{z}, \text{ the threshold level} \quad b > 0$$

but this form lacks continuity. Discontinuity at the disaster level is required to ensure unconditional maximisation of survival. Diagrammatically this would be represented as



The contribution of safety first lies in showing that risk need not increase monotonically with variance (as the traditional mean variance approach claims) and that riskiness of an activity cannot be determined independent of the individual. A difference in perception can lead to a different impact and recovery rate from the same objective shock. Appraisal of a shock depends on the initial condition of the individual household, their time horizon. It could be altered by psychological factors e.g. cognitive dissonance in handling probabilistic information leading to different perceptions.

Lexicographic orderings imply that a household looks at one characteristic at a time. The safety-first model is lexicographic only in a one goal model, because it does not specify how to resolve ties between feasible points once the security constraint is satisfied. If an ordering of the determinants of vulnerability were possible such an approach would show which variables were the primary constraints thus allowing a hierarchical structure for decisions. Given the probability of disaster, the household faces several variables through which permanent loss may be reflected and may rank them in order of seriousness, e.g. death higher than sickness higher than decline in consumption.[28]

The security based approach allows a better understanding of the behaviour of vulnerable households or those prone to instability. Since disaster levels vary across households, it is also possible to delineate the role played by household structure and other socio-economic characteristics. Shahabuddin et al. (1983) test the effect of household characteristics i.e. age of the head, family size and level of schooling of the household head and other economic variables such as off farm income, and total assets on the determination of the risk coefficient or disaster level for peasant households (in Bangladesh). They found that larger family size raised

consumption needs but also augmented total labour supply, its effect on desire for "security" thus being ambiguous.

In a different approach it has been suggested that since actual wealth cannot be negative i.e. no one can lose more than he has, there may be some who go in for risky options, since they know that part of the loss will be borne by others. For example those who burden themselves with debt which they can never hope to repay in their lifetime. Sinn (1983) has formalised this in what he calls 'you can't get blood out of a stone' or the BLOOS rule. If V^n denotes actual or net distribution of wealth and V, the gross distribution then the BLOOS rule is

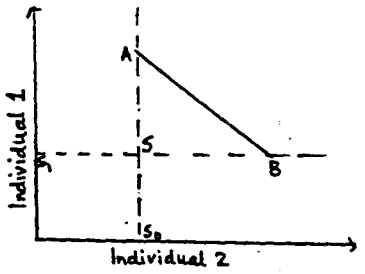
$$V^n = \begin{cases} V, & V>0 \\ 0, & V<0 \end{cases}$$

This leads to a kink in the utility function and may explain apparently risk loving behaviour or behaviour of those who stay uninsured despite facing big risks. However this is not feasible if risks are repeated and penalty for non repayment of debt is very severe e.g. permanent exclusion from the capital market. It is this which may cause the moral hazard problem in credit and insurance markets (Section 3.1).

3.24 A game theoretic approach:

A useful way to view the concept of vulnerability and the associated adjustment mechanisms is in terms of the Nash bargaining[29] problem. The Nash approach was formulated to find a solution to cooperative games where individuals cooperate for their own long-run gain as also because of the existence of moral codes, sanctions against default. Given a joint interest (i.e. non zero-sum game), the problem of sharing-out is determined by the relative bargaining

strengths, which in turn depends on the status quo point or initial fall-back position/security level. Bargaining depends on the alternatives available outside present arrangements. If the two parties can give threats to each other, the fall-back position may be the threat point (unlike the no-trade position in the former case). As the diagram illustrates, there can be a whole range of dominant solutions (AB), and the Pareto criterion will not result in any unique



S = (S₀, S₁) = status quo

equilibrium solution. If individual 1 has a better bargaining position, the outcome will be closer to point A than B, giving him a larger gain. The Nash solution measures gains from the status-quo position (i.e. maximize $(U_1 - S_1).(U_0 - S_0)$) and is inegalitarian in two ways, one in that it preserves the initial inequality and second that it amplifies existing inequalities (if the two groups differ in their risk aversion). For instance, the threat payoffs incorporate the existing power relations. The comparative statics of bargaining involves not only changes in the budget constraint through prices, incomes etc. but also in the objective function itself.

The extent of recovery possible from a shock, and the adjustments made, as through labour contracts (or sharecropping, credit relations) can be seen as results of a bargaining problem. With market imperfections, the contract between employer and employee is no longer determined by the workings of the 'Invisible Hand' but by their respective bargaining strengths. The employer if landlord cum creditor or trader wields influence over several markets, and may be

able to make contracts which are more favourable to him. On the other side, if the employee has access to alternative sources of livelihood e.g. the availability of work in neighbouring areas or threat of migration, he improves his bargaining position. The role of power and powerlessness is clearly revealed in this game. The effects of risk can now be introduced. If it only affects the labourer e.g. debt burden, illness, it makes his position weaker by lowering his status quo position and ability to give threats. If only the employer is affected, the reverse holds, except that it is likely that a loss like crop failure to the landlord will also cause a drop in labour demand and affect the worker. If both are hit by the same shock the final outcome depends on their relative positions (and ability to adjust). Contracts drawn up one period in advance may be primarily to provide security when the probability of a shock occurring is high. The bargaining approach brings in the time dimension explicitly by introducing several rounds of the game with initial conditions and credible threats being altered after each round. The change in degree of vulnerability, or its nature over time, may be explained as a change in the bargaining solution.

For example, the change in the form of labour contracts in India, with a decline in traditional patron-client relationships may be viewed as a result of changing bargaining strengths and position of participants in the labour market. One of the traditional forms for provision of security through the labour market (in India) was the "jajmani" system[30], a patron-client relationship but with dyadic ties involving multi stranded exchanges. The "jajmani" relation needs to be viewed as a whole system[31] which performs certain functions like making the village a self-sufficient community, allocating rank and the distribution of power and authority, and roles of individuals. The motivation of the client was essentially one of

"security", though this safety net may have been provided at a high cost (in terms of services repaid). The system of patronage was thus a mechanism not merely for the distribution of goods and exchange but also for the allocation of power and prestige, making the line between patronage and exploitation, often a thin one.[32]

Contractual arrangements can also be explained as forms of mutually beneficial relations in the presence of risk, with unequal degrees of risk aversion on opposite sides. In the labour market, employees derive security of income while employers may also derive a secure labour force. The contracts become exploitative, i.e. biased in favour of the employer, when he is in a stronger position to bargain, and where the labourer lacks a threat point or has a very low initial security level. One extreme form of labour contracts is that of bonded labour, where bargaining is so unequal as to be virtually absent. Though bonded labour has been legally abolished in India, it continues to exist in certain parts of the country. Labour tying may also arise purely from uncertainty on the employer side, regarding availability of sufficient labour in the peak season.[33] The form of these labour contracts differ from the earlier patronage ones and illustrate a mechanism of labour hoarding by the employer.[34] This could be linked to our earlier view on changing resource scarcities (Chapter 1).

Bardhan and Rudra (1978) carried out a study on the terms and conditions of contracts prevalent in rural labour markets (in West Bengal). They observed a range of contracts varying from fully attached to totally unattached labour with different degrees of semi-attachment in between. The co-existence of several contractual arrangements can be a reflection of differences in risk aversion, need for security, quality of labour, and market imperfections (all determining relative bargaining strengths).

To judge the role performed by contracts in altering vulnerability, the conditions can be specified in terms of:[35]

i) duration of contract, e.g. months, years

ii) basis of payment, e.g. hourly, piece rate, share of output

iii) medium of payment, e.g. cash, kind, meals

iv) frequency of payment

v) degree to which obligations are specified

vi) freedom to work for others

vii) interlinkage, if any

Three types of labour arrangements are reported for some villages in Maharashtra and Andhra Pradesh by Binswanger et al. (1979), which we can try and distinguish in the format outlined above, as an illustration. These forms are first, the market for daily-rated labour where payments are made every day for a fixed numbers of hours-worked. Second, contract jobs which are given out on a piece-rate basis and provide a higher income than the first with access to these often being through personal networks (and caste ties). Thirdly, the category of rural farm servants (RFS), where the relationship is more long-run (up to a year).[36] A strong motive for entering into rural farm servant relationships was the possibility of obtaining loans or advances in wages (otherwise the need for collateral). Consider the table:

	Type of Labour Arrangement:		
Features	Daily	Contract	Rural Farm Servant(RFS)
1. Duration	one day	a day or more	up to a year
2. Basis of payment	hourly	piece rate	share of output
3. Frequency of payment	daily	not daily	varies
4. Medium of payment	differing proportions of cash and kind in all		

5. Degree to which obligations specified	definite work	task specified	more open(?)
6. Freedom to work for others	complete	limited	restricted
7. Interlinkage	absent	possible through access to jobs	with credit
8. Security to worker	none	little	more

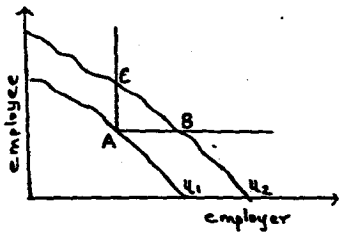
This gives an illustration of the variety of contracts possible. Another feature which came to light was that the rural farm servants relation was only open to men, and therefore, women without assets would be in trouble raising the loans associated with them. This again highlights the need to disaggregate household labour endowments (as women's labour may be discriminated against in the labour market and also in credit availability).

Government intervention in the labour market can be evaluated with respect to its impact on bargaining positions and the form of contracts. Policies such as the Employment guarantee scheme of Maharashtra may alter the security level of workers by providing a minimum entitlement. The ability to give threats may be altered if the opportunities for migration are improved. Land reform, on the other hand alters the status quo itself. Policies could thus be classified as those altering initial positions versus those altering claims, threats, perceptions, i.e. the tools/means of bargaining, in terms of the Nash approach.

3.25

Theories have also grown to explain interlinking between different markets in the context of risk, desire for security, market imperfections.[37] It is argued that contracts may be drawn up to overcome the 'moral hazard' problem and incentive compatibility where

employers cannot monitor the activities of the tenant/labourer fully e.g. with existence of information costs, and significant risks. It is possible that interlinkage shifts the utility possibility frontier outwards, but actual accrual of benefits can go to either or both parties. An alternative explanation argues that packaging of transactions may be a way of internalising externalities e.g. in the use of non-marketable inputs like family labour.



u = utility possibility frontier

Labour contracts which provide credit can add to security but interlinking can also worsen vulnerability, for example, loss of credibility in one market lowers opportunities available in others as well. This would depend on the penalty for default which could range from bonded labour to bankruptcy or loss of future credit, and how workers perceive these penalties. Further empirical work is required to distinguish among these possibilities.

These security and game theoretic approaches can be good guidelines for policy making as well. For instance, policy makers could attempt to alter the probability of shock itself i.e. lower it through a package of policies (see Chapter 5). Decisions can also be viewed sequentially as in repeated games. For example, lack of strong collusion among rural labourers may be partly explained as some kind of reverse prisoner's dilemma in operation, where it is in the interest of them to collude but each worker fearing retaliation from his employer does not do so. Bardhan (1983) reports that most of tied labour respondents do not participate in any form of group bargaining or labour agitation, citing ties with the landlord as reason for

non-participation.

3.26

An alternative way to study this problem is using the entitlement approach.[38] In moving away entirely from utilities and concentrating on the endowments of a household and its mapping through production and trade entitlements to achieve a target (income or consumption), more insight is gained into the nodes at which the impact of risks occurs and on causes of vulnerability. This approach is briefly outlined below. Let us define the function E() from X to Y as the exchange entitlement mapping or E mapping of the household:

$$E(x) = \{ y/y \in X \text{ and } p.y < p.x \}$$

where X is the set of all non-negative vectors of all commodities and Y is the power set of X, i.e. all sub-sets of X

Let X be the vector of commodities owned by the individual or household and p the associated vector of prices. Further, a minimum food requirement can be defined by FCX, and $E(X) \cap F = 0$ then describes the occurrence of starvation. Starvation, S, therefore depends on F and the E mapping.

$$m\ (p,\ F) = \min p.x \,/\, x \in F$$

In this approach, the first extension can be disaggregation of the endowment set, characterising it not just as a vector but even as a matrix. For instance if studying labour households, the most important endowment is labour power. The heterogeneity of the labour bundle can be brought out in a matrix which may distinguish some of the household characteristics mentioned earlier. For instance consider the following matrix:

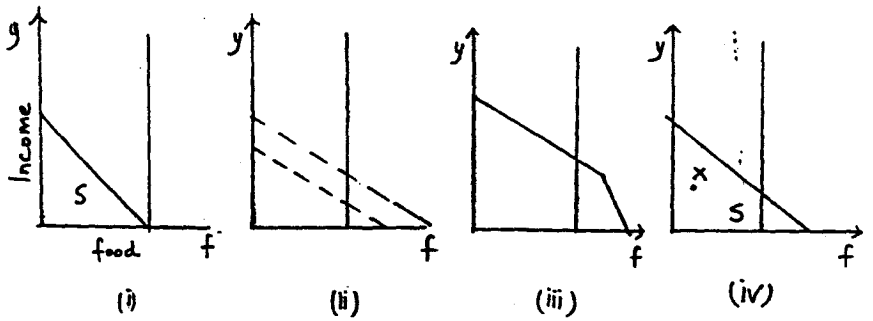
$$\ell = \begin{array}{l} \\ \text{male} \\ \text{female} \\ \text{child} \end{array} \begin{array}{c} \begin{array}{cccc} \text{age} & \text{dependency} & \text{skill} & \text{disability} \end{array} \\ \begin{pmatrix} \ell_{11} & \ell_{12} & \ell_{13} & \ell_{14} \\ \ell_{21} & \ell_{22} & \ell_{23} & \ell_{24} \\ \ell_{31} & \ell_{32} & \ell_{33} & \ell_{34} \end{pmatrix} \end{array}$$

where dependency is the ratio of dependents to workers and takes its lowest value = 0 if there are no dependents, skill is gauged by presence or absence as is disability i.e. of some permanent nature. The age coefficients may be positive for the young and negative for the old. Similarly dependency may take a value greater than one when there are less contributors to the labour endowment of the household. All the coefficients need not be known, but specification of some will give a good idea of the kind of labour power that the household has to offer. Disaggregation helps in identifying sources through which recovery is possible.

Next we can look at the mapping facing these households (is vulnerability caused by a more unfavourable mapping?). Mapping can be of market relations, i.e. through prices, wages and available opportunities for employment or through non-market relations such as informal help arrangements. A simple observation, is that the exchange mapping differs between seasons. In the slack season one finds declining wages and employment associated with rising prices, making terms of exchange of labour for goods and money more adverse. A comparative static approach could be used to study the shifts in mapping. For example, consider the seasons, 1 = peak and 2 = offpeak. The endowment matrix with only labour is $\underline{x} = \ell$, ℓ^1 and ℓ^2 for the two seasons, and the possible relation between them $\ell^1 > \ell^2$.[39] The exchange rate (i.e. wages) could be $w^1 > w^2$ assuming all wages higher in the peak and price of commodities may be of the reverse

order $p^1 < p^2$. Notice that in the second period both the quantity and quality of the endowment may change and be smaller e.g. less food and the prevalence of disease in the off peak season may lower the quality of labour (i.e. ability to work) supplied. Quantitatively, there may be a decline in labour supply due to migration. It has to be remembered that looking at equilibrium points reflects demand and supply forces, demand for labour being lower in the slack season along with supply differences.

Vulnerbility can occur through altered terms of trade and also through a change in the endowment vector or matrix itself. Security can be defined in many ways within this approach, either in terms of a food bundle and the starvation set or other specifications. For instance one could estimate the wage and days of employment required (jointly) to stay above the starvation set.[40] Consumption possibilities open to households need not be linear. Consider the diagram below. Figure (i) shows the income needed to obtain a certain minimum requirement of food (on the x axis). The next figure illustrates a possible shift in the budget set, say systematic shifts in consumption possibilities arising from seasonal movement in wages. The consumption possibilities may be non-linear (figure iii), if there exist market imperfections, for example if price of food grains is different when purchased from a ration shop, trader, landlord. The last figure (iv) shows how the budget set may collapse to one point such as X (within the starvation set).



The advantage of using this approach lies in the ease with which both production and trade entitlements can be introduced, e.g. the case of artisans or self-employed. It is also a better way in which to study the impact of alternative policies attempting to provide some form of security, since it can be easily reflected through changes in the budget set.

A possible way of extending the model to incorporate household structure is to consider different types of households and characterise the endowment and mapping associated with each separately. For instance, a household dominated by female labour may have the endowment $\ell = \ell^f$ where ℓ^f is female labour (vector) and income = $Y = w.\ell^f$.. If we consider two periods again s^1 and s^2, the peak and slack periods respectively. In s^1, $w = w^1$, $\ell = \ell^f$, and in s^2, $w = w^2$ where $w^2 < w^1$. Wage income ($= w^1\ell^f_1$, or $w^2\ell^f_2$) can decline in the second period because of a fall in wages or employment or both. If the labour market collapses completely i.e. no wage employment for females in the slack period then $\ell^f 2 = 0$ and the budget set may jump to a discrete point in the interior of the starvation set such as X (figure iv). (Exchange mappings need not be characterized by smooth curves.) Along with information on the type of resources of a household, for assessing vulnerability we need to

know at what price each resource is tradeable and how prone it is to fluctuations e.g. if the female labour market is known to be more volatile, then a household dominated by female labour will be more vulnerable.

Risks can be introduced by making the mapping a stochastic one, i.e. introducing probabilities of achieving the target with varying exchange ratios. e.g. $E(x) \cap F = \phi$ for household h with probability p and $p \simeq 1$ in a crisis situation. Alternatively, the impact of varying states of nature on the exchange entitlement mapping can be studied through constructing a multiperiod mapping e.g. food prices in period 2 will be contingent on the state in period 1 (say occurrence of a drought).

This approach however only deals with one extreme form of adjustment, through starvation (and death). Vulnerability, and degrees of it, however, incorporate a range of achievements. It is also multi-dimensional, including a vector of variables other than a minimum food requirement (e.g. vulnerable to disease). Instead of defining a definite cut-off for the starvation set, a region could be defined to identify the vulnerable (See Section 1.6.2). A total failure of all entitlements and exchange mechanisms leads to starvation while deterioration in some entitlements coupled with inadequate adjustment mechanisms leads to a vulnerable position with respect to under-nutrition or sickness, which could be as undesirable as the former. A broader framework is needed to allow a study of a shortfall in different characteristics and the responses to each.

3.28

So far, some ways of approaching the question of maintenance of stability and provision of security for rural labour households have been outlined. The discussion has in no way exhausted the forms of adjustment possible. One big gap which remains is in the realm of commodity markets which invokes issues of availability (quantity and quality constraints), storage, trade, and speculation.

Even this glimpse into adjustments to risk brings out the inadequacy of insurance mechanisms for these households, on grounds such as incomplete and inefficient markets, imperfect information, non optimising behaviour of individuals, making vulnerability a very real and pressing problem. The next chapter provides preliminary evidence on some dimensions touched so far regarding the exposure of rural labour households to shocks.

Footnotes:

1. See A. Deaton & J. Muelbauer.

2. Stiglitz and Weiss (1981).

3. Storage, one reason for lack of accumulation, can be important in determining vulnerability and also for policy measures.

4. Lipton puts this view forward in 'Agricultural risk, rural credit and the inefficiency of inequality' in Roumasset et al. (eds).

5. See Binswanger and Sillers.

6. Stiglitz and Weiss (1983).

7. Sen (1975).

8. See K. Bhardwaj.

9. Interested readers may refer to Piore for a discussion on the possible paradigm that theories of segmented labour markets may belong to.

10. For example, evidence in Ryan and Ghodake.

11. A. Deaton & J. Muelbauer's almost ideal demand system aggregates over consumers without invoking parallel linear Engel curves and is starting to provoke empirical work. See American Economic Review, June 1980.

12. Rosenzweig, Barnum and Lyn Squire have econometric specifications with some of these distinctions.

13. See Bliss and Stern.

14. Bardhan (1979), Ryan and Ghodake, Binswanger et al. (1982).

15. P.K. Bardhan (March 1979) estimates elasticity of male labour supply with respect to wage as 0.2 approximately.

16. Newbery and Stiglitz (1981) give a detailed exposition of this.

17. Newbery and Stiglitz, Quarterly Journal of Economics, 1982.

18. Refer to M.J. Lord.

19. See Hey.

20. Empirical work on estimating expected utility maximising behaviour was attempted by Binswanger (1979) who offered hypothetical and atual choices to determine individual responses to risk. His evidence was consistent with expected utility maximisation, most farmers displaying moderate risk aversion. Binswanger and Sillers (1983) go on to argue that it is credit constraints rather than risk aversion per se which determines farmers' decisions.

21. The simpler two parametric substitutive criteria use a mean-variance approach i.e. a risk-returns tradeoff, and are concerned with two variables only, being valid for quadratic functions alone. The quadratic utility function however is only valid for a bounded range and displays increasing absolute risk aversion everywhere. Identification of riskiness with variance alone is unsound since a distribution with a larger mean and smaller variance may not be preferred by all who are risk averse. See Hanoch and Levy.

22. Regarding discrete choices or options, one could picture the situation in terms of Hirschman's Exit, Voice and Loyalty where migration is a form of exit, voice reflected in protests, bargaining and loyalty in accomodating to given surroundings. A.O. Hirschman, 1970, Boston.

23. Lipton (1983), Labor and Poverty.

24. Differences in participation and labour utilization characteristics can be associated with socio-economic characteristics using discriminant analysis as in B. Dasgupta et al.

25. F. Cancian in Roumasset et al. (eds).

26. As Scandizzo and Dillon show, safety first criteria may be followed where satisfaction of basic needs is at risk. In Roumasset et al. (eds).

27. Sutti Ortiz in Roumasset et al. (eds).

28. Roumasset's (1976) approach defined a risk sensitivity index and damage-matrix for farmers in rice production and defined a disaster level by converting minimum calorie requirements into per farm production requirements.

29. J.F. Nash, The Bargaining Problem, Econometrica 1950.

30. The word jajmani originates from the sanskrit word 'yajyaman' which means one who has a sacrifice performed i.e. the master who employs the sacrificer and shows the origins of the system in roles assigned to different castes by the varna system. See Louis Dumont.

31. Kolenda in Dalton (ed).

32. Jan Breman, who points out that the jajmani system was not an ideal social security system, but had elements of it despite unequal exchange that may have prevailed.

33. Additional reasons can be given such as supervision problems.

34. Bardhan (1981).

35. Bardhan and Rudra (1978).

36. Interestingly very few RFS contracts were longer than a year and not as complex as older patron-client relations. Also many RFS were laid off in drought periods.

37. See Bardhan (1980), Braverman and Stiglitz.

38. Sen, Poverty and Famines.

39. To say one matrix is larger than the other implies that each element is larger.

40. K. Dandekar estimates that it requires 300 man days of employment at the wage rate of Rs 6 a day for a couple to maintain a family of five, using a poverty line of Rs 720 p.a.

CHAPTER FOUR

Some empirical findings:

A case study of two villages in India

4.1 Introduction:

In this chapter an attempt is made to illustrate some of the features associated with vulnerability which have been discussed earlier. The analysis is based on data collected in the village level studies programme of ICRISAT[1], on two villages in Maharashtra, Shirapur and Kanzara in Sholapur and Akola districts respectively (map in Appendix 1). Since the data were collected with other hypotheses in mind, it can only be used to provide a glimpse of the problem. The indicators of vulnerability (see Section 1.6.2) are state variables rather than outcome variables but lacking data on variables such as health, nutrition, mortality, the response to external shocks is gauged from data on income and asset variations. This can only be illustrative of the kind of adjustments made and extent of instability but it does provide support to our earlier discussion. Attempts are also made below to link household characteristics to vulnerability.

Both villages lie in the semi-arid tropics. Shirapur has a lower average annual rainfall (of 691 mm) than Kanzara (817 mm) and also a more variable one, and is highly prone to drought despite more widespread irrigation (though limited). The main crops are sorghum, groundnuts, pulses and pearl millet. Cotton is also grown in Kanzara.

The general characteristics of the two villages reflect an economy based on agriculture, and they reflect general poverty. The major occupation is cultivation or agricultural labour (tables 1 and 2, Appendix 1). In terms of infrastructure and services, neither is well equipped e.g. not having any formal medical facilities. Kanzara has an all weather road to the nearest town but Shirapur has a road only

operational in the dry season. Shirapur had a total population of 1615 in 1975/6 with 23.5% of landless households. Kanzara had a population of 930 (in 1975/6) but a higher density and 32.5% of landless households. The higher proportion of landless and labour households in Kanzara is mainly due to the high labour requirements of the cotton crop which can sustain more labour households in terms of employment and income.

Keeping in mind this static picture of resource availability in the two villages, we can go on to look at some of the variables and changes in them at thehousehold level. Within each village, the sample consisted of forty households representing the different landholding categories, viz, labour (landless or nearly so), small, medium and large farm households. We shall focus on 'labour' households and small farmers since in a dry farming region they may be expected to be very vulnerable.

4.2 Shirapur:

For this village[2] data is available over a three year period (1977/8 to 1979/80) and is analysed in an attempt to bring out the instability in the lives of the poor and 'labour' households. As the characteristics of health and nutrition are unavailable in the given data, instability/vulnerability as reflected in income, employment and assets is described here. Later an attempt is made to identify household features that may be associated with greater vulnerability.

General: The distribution of the sample by landholding class was selected to have a near equal representation of all classes. Labour households are slightly better represented, and defined as those owning 0.2 hectares of land or less and with their main source of income coming from their labour i.e. wage income. (They need not be completely landless.) Looking at household size, 50% of the sample households were of a medium size i.e. with 4 to 7 members with a quarter each of small (0-3) and large (8-11) households. Average household size tends to rise with ownership of land, supporting other evidence from India that richer families and landed classes have larger families.

For an estimate of poverty in the village, using per capita incomes one finds that 73% of the sample had income less that Rs 800 per annum (equivalent to Rs 66.6 per month) at current prices in 1977/8. (Rs 65 per month is the poverty line used by the Planning Commission, Government of India, at 1977/8 prices.) Further 31% have per capita incomes less that Rs 400 per annum, indicating the inadequacy of a poverty line measure.

Climate: In Shirapur, data on distribution of rainfall reveal the bunching of rainfall in the months June to September. Large yearly variations are present, the greatest in 1977 which had 40% less than the average. Incidence of crop failure was also highest in 1977/78. Most of the deviations occur during the rainy season (table 1), making the environment a source of recurrent shocks. In addition other non-climatic shocks may be present.

Income: A breakdown of incomes for the labour and small farmer groups (table 2) indicates large year-to-year variations, and hence a likelihood of income shortfall for some households in certain periods. A seasonal breakdown of incomes would have made this variability clearer. Labour income accounts for 63% of net household income for labourers and falls to 48% for small farmers, while share of livestock income rises from 11% for 'labour' to 34% for 'small farm' households. The largest contributor i.e. labour income for the former group is

also the one with highest variability over the three years. For a given year, in this group, about 13% of labour income came from regular employment, the rest being earned by casual work, indicating the lack of permanence in contracts, and hence in a form of security. Within the group, variability is again highest for regular labour income i.e. only a few can obtain it. Regarding household size, medium sized households averaged a higher labour income (of Rs 2931.6 p.a.) compared to small (Rs 1304.7 p.a.) and large (Rs 1911.5 p.a.) households. Small units may have too few working members and large too many dependents.

Employment: The pattern of employment can illustrate the instability in the labour market. The biggest source of employment is agriculture, in which is implicit a seasonality of operations, and a sexual division of labour. Harvesting and threshing are jointly performed operations; nursery bed raising, transplanting and weeding are predominantly female operations while field preparation, sowing, fertilizing, irrigating, plant protection, supervision are predominantly male operations. Children do not contribute much to agricultural work. Thus for men, ploughing and preparation of pearl millet, and mung bean occurs in April-May and July-August with January to March being relatively slack. For women, harvesting and threshing of pearl millet, mung bean are concentrated in September, and the winter sowing and harvesting of wheat, sorghum, chickpea in December to February.

Graph 1 (and the associated table i) illustrates the pattern of seasonality in farm employment and government employment for male, female and child workers. For example male farm labour peaks in August (at 6.6 days per month) and in December, reaching its lowest point at 3.5 days around March-April. Government employment tends to

be contra-seasonal. The figures reflect a low level of employment which arises partly due to the problem of aggregation. The employment data (available for only 20% of the sample) is averaged over all household members which may include the sick, old or disabled people, and the unemployed. Another reason could be inclusion of those who participate even once during the standard fortnight. (The non-farm employment data reveal absurdly high figures and are hence excluded from the discussion at present assuming some error.)

Female employment is also bimodal and ranges from 2.4 to 6.6 days per month. Government employment is important in counter-balancing seasonal slack periods. Female employment seems to fluctuate more, in addition to which women face a discrimination in wage rates. Wage rates[3] for farm and non-farm work are plotted in graph 2 and can be seen to be loss volatile than employment (Tables 5 and ii).

Putting wages and employment together gives a picture of total wage earnings, which are likely to be lower and more variable for women workers, making a women dominated household more unstable (see Graph 3). As male and female peaks in labour demand do not coincide, a household with a balanced sex ratio can take advantage of this in smoothing income accrual.

Assets: Turning to assets, we note that high variability in their values can be an indicator of vulnerability. Table 4 gives a breakdown of assets for the labour group and an idea of the extent of within group variation. More interesting however is the change over 3 years which is summarised in Table 5. The movements are quite dramatic. For the labourers, there are large changes in the value of livestock, which may be their most important and easily varied asset. Consumer durables, stock, financial assets and liabilities also show a high variability. Although the data is on an annual basis, the

decline in net wealth over the first period for 'labour' households which is not made up in the second period reflects a type of non-recovery.

For the small farm households, there are large movements in the value of implements, consumer durables, livestock and stock with the last two moving in a direction opposite to expected. There is less variation in total assets, and what seems like nearly complete 'recovery' in terms of net wealth over the three year period. Also, in a period where labourers lose the small farmers may gain (e.g. livestock value) making the question of who gains and who loses in a shock, of importance for further investigation.

Credit can play a critical role in the process of recovery. The limited data available on this (Table 5, 6) indicate a sharp rise in the debt burden of labourers over the two periods. Labourers face large increases in debt but small farmers are less firmly indebted. One needs more disaggregated information to analyse the role of credit in insurance and recovery.

Household structure: An attempt is made to relate household characteristics to the observed variability in income and asset values which have been taken as proxies for instability. This kind of analysis can help in the identification of groups more/less vulnerable to shortfalls and non-recovery from shocks.

Variability of incomes or asset values is not meaningful without knowledge of the average of the households as well. Dividing the sample of labour and small farm households into two groups i.e. poor and ultra poor, they are then ranked by declining variability in per capita incomes (Table 7 provides the associated household characteristics for this). What emerges is that the households facing highest variability are also those with the worst poverty e.g. within

the ultra poor those with lower average incomes face greater fluctuations. The poorest may be prone to more shocks or those unable to adjust well to such events.

Table 8 gives the household characteristics for households ranked by declining variability in incomes (labour and small farm households only). This illustrates some associations e.g. the more variable income households tend to have young dependents and an over-representation of women, especially in the working age group. A similar ranking is presented in Table 9 for variations in asset values[4] (based on the coefficient of variation), which can be taken as an indicator of vulnerability.

Although not very strongly related in the data some tentative relations[5] which emerge between household features and variability (of asset values) are:

i) Regarding household size, the top five ranks (i.e. higher variability) are not found among large households. More members may thus be a help in risk spreading by allowing a greater diversification in activity.

ii) The sex ratio (or proportion of females to males) tends to be higher among the households ranked at the top. The first five households have more females to males with one exception of a family with many male infants. Further, most of the households with greater variability had a stronger bias in favour of women among the working age group, which is more relevant in determining economic responses.

iii) Greater variability also seems associated with higher dependency. Since a household with young male children is likely to be much better off in some years, the stage of the life cycle has a role in determining instability. These households are also biased in favour of younger members.

iv) There is no definite relation of variability in asset values with

structure of households i.e. nuclear/extended/single. However it should be noted that none of the households were extended in the sense of being large joint families with several married sons living together as is found often among the land owning classes.

v) In terms of occupational structure, the top three households had only a single occupation i.e. wage labour in agriculture while others had some secondary occupation which was mostly income from livestock. Household structure can thus give good clues on vulnerability of households.

4.3 Kanzara:

A similar analysis of data was undertaken for the village of Kanzara. The discussion is therefore kept brief and only some of the contrasts with Shirapur highlighted.[6]

General: The sample in Kanzara had a higher proportion of landless and small farmers (and no large farmers). The village appears to display lower income per head than Shirapur though a more even distribution i.e. in each landholding class there was a significant difference[7] in per capita incomes between the two villages but the spread between land classes was less in Kanzara). As before, household size increases with landholding.

Climate: Considering climatic changes to be a major source of shocks, the prevalence of a higher average rainfall with less variability makes the picture more favourable for Kanzara i.e. the frequency of shocks from this source are lower (Table 1). Rainfall deviations are smaller than in Shirapur and also less frequently in the downward direction.[8]

Income: The composition of income and extent of fluctuations in it, for both labour and small farm households are given in Table 2. Both reflect large changes over the three year period though some of it is attributable to large intra-group variations. Looking at the group for one year, contribution to labour income from regular sources is higher than in Shirapur (nearly two fifths of total labour income). The contribution of women and children is also relatively greater. Larger variations are found among regular labour income and child labour income (i.e. two unstable sources) indicating the imperfections of these markets and possibly limited availability of employment in each.

Employment: The graphs and associated tables in Appendix 3 illustrate the seasonality of employment on farm, non-farm and Government work (Graph 1). The availability of employment in agriculture ranges from 4.4 to 8.5 days of work per month for males with a trough in October-November. The range for women is 5.5 to 8.1 days in farm work which is a slightly lower variation than for males. On average, employment levels are higher in Kanzara as compared to Shirapur. Females however suffer in terms of non-farm employment, which is highly volatile and practically non-existent in some months of the year e.g. December to April. The large fluctuations are lowered by the introduction of employment on Government schemes, for both men and women.[9] The discrimination against women in wage rates is quite stark (Graph 2 and Table 3) and the picture on total earnings is depicted in Graph 3, which continues to show large fluctuations over the year.

Assets: Table 4 provides a static picture of the asset situation of labour households, revealing low average asset values and a skewed distribution of assets within the group. Changes in asset values over

che three years (Table 5) are not as dramatic as in Shirapur. Most assets have gone up in value (i.e. positive change) except for a decline in financial assets mainly cash. This may reflect financial assets being used to purchase other assets. The debt position has not steadily worsened for any group (Table 6).

Household structure: Again a ranking of households by variations in their asset values and incomes was attempted to relate it to household characteristics (Tables 7, 8, 9). Regarding household size, the larger variations are not among the largest households. There tends to be a higher female/male ratio in households with greater asset and income variation (and a further bias in favour of women in the working age group). Predominance of women in the 'earning' category may itself be a source of low and variable incomes.[10] For example, the household with highest income variability (among the ultra-poor group) consisted only of women; a mother and daughter-in-law with child, all male members having migrated. Migration of some members need not lead to greater stability for those remaining (especially in a period of transition). The second in rank (Table 7) is a household with many young children, again reflecting an association between dependents and vulnerability (though no clear correlation emerges), and the relevance of the stage in life cycle for the household. The sample is too small to reflect any definite trends, and is only used to suggest possible linkages.

4.4 Conclusion:

Treading cautiously on this preliminary evidence, one only catches a glimpse of the way in which the analysis can be pursued further. There is an indication of large variability in living standards, leading one to look for causes of instability among households and mechanisms which help or hinder in ability to face shocks. The functioning of the labour and credit markets display imperfections but one needs more information on both e.g. the conditions of loans, punishment for default, wage versus kind payments in labour contracts. In addition information on other variables like health, sickness, nutritional status needs to be monitored. More details on household features and changes in them over time and in response to shocks can help answer questions like how structure of risk varies with household size, or age of household head. Several other issues such as the relation between economic and medical risks can then be explored.

Field research, using a stratified sample, for instance with different socio-economic groups further differentiated by household types can gather data which enables one to study responses to risk. Using two or more villages in differing locales can illustrate a range of risks encountered. Such data would have to be collected on a weekly or monthly basis to capture seasonal changes and over at least one year i.e. a complete agricultural cycle. Other time series data should be used to support this. Further research would allow a better classification of vulnerability and its determinants.

This micro study only suggests that vulnerability may be important in rural labour households. On a more macro level, the issues on which policy makers need to focus is discussed in the following chapter.

Footnotes:

1. Details of the Village level studies are available in Jodha et al. (1977), Binswanger and Jodha (1978) and Singh et al. (1982).

2. All data for Shirapur is in Appendix 2.

3. All wage data include an imputed cash value for payments made in kind, at current prices.

4. The downward coefficient of variation may be a better indicator of vulnerability, especially if a safety first model of behaviour is used, and should be used in further empirical work.

5. The hypotheses are based on a very small sample and should be only considered indicative.

6. All data for Kanzara are presented in Appendix 3.

7. At the 5% level of significance.

8. The years 1980-82 show greater climatic variability but lack of other data at present for these years prevents further analysis.

9. The MEGS operative in this region is discussed in Chapter Five (5.3).

10. Lipton argues that women may not belong to the poorest or vulnerable group but further empirical evidence is required to establish either case.

CHAPTER FIVE

Thoughts on Implications for Policy

5.1

One has to be careful in suggesting a possible role for Governments in the context of vulnerability as their role has been ambiguous; as a positive stabilising agency at times and at others a factor in the cause of disasters.[1] On the other hand, 'crises' at times bring forth special effects, and release a creativity otherwise hidden; for example the Employment Guarantee Scheme of Maharashtra (MEGS from now) had its genesis in the drought of 1972-73, starting as a relief measure and continuing as a full fledged scheme.

Recapitulating briefly, the discussion on vulnerability has laid emphasis on the potential instability facing many poor households with regard to a sudden shortfall in income, food, health, nutrition (Section 1.6.2). The notion of recoverability was stressed (Section 1.1, 1.5), which depends on several factors; the nature of the shock, the conditions of the household, and the adjustment mechanisms available through market and non-market structures. Potential instability has undesirable welfare implications, so there is a case for provision of 'security'. This is no new discovery, and is in the spirit of the Universal Declaration of Human Rights[2], Article 25 of which states that, "Everyone has ... the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control." The provision of complete social security is an impractical task for most developing countries and can entail prohibitive costs, especially given a large population. This is not to argue that the Welfare State is undesirable, for our discussion in earlier chapters has outlined reasons such as constraints in the credit market, slack or temporary

contracts in the labour market (Chapter 3) which can lead to inadequate adjustment mechanisms. It is in light of this, that possible interventions by the State will be discussed in this chapter (Section 5.2). Preventing vulnerability encompasses both short-run bridging solutions as well as long run issues such as the provision of entitlements. The last is reflected well in the historical shift in policy towards the provision of food security; from the narrower focus on adequate food supply to one of food distribution and finally to the question of entitlement to food. The last section of this chapter evaluates two policies of the Government of India contrasting them in terms of their scope in general poverty reduction vis a vis reduction in instability or provision of security.

5.2

First, a few general issues, one regarding the value judgements to be used in any social welfare function that policy makers choose. Priority can be given to the removal of vulnerability by a higher weighting to a Rupee spent on stabilising earnings rather than raising the average level. Further a preferential weighting can be given to public expenditure on certain vulnerable groups in the economy e.g. class of landless labourers or rural women as also to expenditure at certain times of the year (e.g. seasonal slack periods). Given limited resources, it is essential to state one's priorities explicitly in the choice of policy measures. Vulnerability was defined in an ex ante sense, and brings out an emphasis on preventive rather than curative measures as in the realm of health care policies.

Policies can be discussed in terms of their impact on reducing shocks, altering initial conditions or improving mechanisms for adjustment. Reversing the order from earlier chapters, we begin with

a discussion of policies in the realm of adjustment (5.21), then relating to initial conditions (5.22) and finally to shocks (5.23). There is however considerable overlap among these.

5.21

The State can play a supportive role by strengthening existing adjustment mechanisms where possible and by introducing new measures which help in adjustment. Looking at the former, there is only limited scope for improving traditional adjustment responses. For example, it is difficult and probably not desirable to reverse the decline of the traditional 'jajmani' (patron-client) relationship. Legislation on minimum wages, conditions of labour hiring may influence the form of new contracts in the labour market but can only have limited influence with an unorganized labour force.

The credit market can be improved in two ways; one by the strengthening of the market in general through the promotion of banks, cooperatives (i.e. better financing facilities) and second the provision of insurance and specific credit subsidies in times of crisis. The general provision of subsidised credit for the acquisition of assets (see SFDA section 5.3) needs to be supported by additional timely intervention e.g. loans to prevent distress sales. While the case for consumption credit for the poor is in general weak (because non-repayable), there can be a case for its provision where it specifically prevents instability and makes recovery feasible. For example, if one can identify households who are likely to face a liquidity constraint at critical moments, which halts their otherwise feasible 'recovery', then they should be the target for loans or transfers. Gifts and transfers cannot be viewed as a long term solution but may be required to overcome shocks, given no other social security provisions. In some cases, additional loans may not help in

recovery and push households into a worsening debt trap. In those cases insurance is more important. Private markets for multiple risk specific risks e.g. crop insurance, livestock insurance may be hampered by high costs: administrative costs, costs of collecting (and spreading) information, moral hazard, highly correlated risks and so on.[3] However attempts such as the crop-loan insurance (i.e. tying loan repayment to crop harvest) need to be expanded in coverage.

Another kind of insurance possible is through a public distribution network for the supply of essential commodities. With the spread of fair-price shops, and rationing schemes (or food stamps if necessary), households can be insulated from market fluctuations to some degree. If the ration price is subsidised, it effectively raises the real income of consumers. Given the noticeable fluctuations in food prices in rural areas (Chapter 1), both in response to seasonality and speculation or hoarding, the risk of under-nutrition can be minimised by a rationing scheme. In some cases (or seasons) for those who lack any source of cash income, it may be necessary to establish free kitchens. This may not be such a silly suggestion, for example, as Sen and Sengupta[4] suggest direct interventionist nutrition programmes may be more beneficial to the poor than land reform.

Health care policies have a very important role to play in lowering vulnerability (to illness, disease, death), especially through preventive medicine which raises resilience among individuals rather than curative care which treats the symptoms of disease. Given the high costs of medical care, medical insurance to all may not be feasible, but a policy emphasising a large preventive health care network and some specific insurance e.g. to permanently disabled or writing off terminal medical costs may be pursued. The success of China[5] in the provision of basic health care services through the spread of bare foot doctors, a referral system, and insurance through

cooperative medical services should be an example to follow. Similarly, special nutrition programmes such as meals for children at school or for pregnant mothers can help particularly vulnerable groups in the population, though some groups such as children not attending school may still get left out.

5.22

Changing initial conditions is getting to the root of the problem, and allows both for risk minimisation and risk spreading. Thus on a broader canvas, the issue is provision of sufficient entitlements to members of vulnerable households. Income generation and diversification is an inevitable step in the spreading of risk. Employment generation needs to be undertaken both by improving general conditions of labour demand and also specifically by creating work in off-seasons. The success of the MEGS in achieving these objectives will be discussed later (Section 5.3). Income diversification requires increase in non-farm activities as well. Better transport, education, spread, of information can allow risk spreading through opening up opportunities for migration.

On the asset front, raising endowments through assistance for acquisition of new assets has been attempted in various schemes (See SFDA, section 5.3) but maintenance of existing and new assets through provision of infrastuructural services can be as important. In the long run the desirability of land reform, even though it cannot provide adequate land to all is acknowledged by most policy makers and needs to be implemented more effectively.

5.23

Attempts at reducing shocks or their impact fall into three broad (risk reducing) strategies. One is the introduciton of wage or price

stabilization policies. The impact of a stabilization policy depends on the source of risk (see Chapter 3). For farmers for example, it was found that yield variability was the predominant risk in unirrigated semi-arid tropics while price variability was the major risk for those in the irrigated areas, making price stabilization more useful in the latter case and some kind of crop insurance better in the former.[6] Similarly with wage stabilization, net gains to workers will depend on the elasticities of demand and supply. If labour requirements are inelastic, workers will gain in the slack season and lose in the peak period, the net effect being ambiguous. Wage stabilization may even have a negative effect on earnings. A policy of minimum wages may be a better tool in rural labour markets, though the choice of its level is important, maybe starting by setting a wage floor near the off-season wage and raising it over time.

Second, are long run programmes which attempt to lower the occurrence of shocks by stabilizing the economy i.e. preventing desertification, or soil erosion, increased water conservation which are in the realm of lowering area vulnerability.

The third set consists of a host of short run measures designed to minimize losses from disasters i.e. policies undertaken in the aftermath of a large shock such as a flood. Disaster management of this sort exists in detailed plans (operational, financial and organizational management) in India[7] and is given less emphasis here in contrast to policies which raise the recoverability of households.

5.3

A comparative analysis of two policies adopted by the Indian Government namely the Small Farmers' Development Agency (SFDA) and the Maharashtra Employment Guarantee Scheme (MEGS) is used as an illustration to highlight someof the differences between policies aiming at poverty reduction rather than those lowering vulnerability.[8] Both are anti-poverty programmes but one can distinguish several features of the MEGS and SFDA which cater towards preventing vulnerability (i.e. altering the instability in the labour market).

The SFDA was started in 1971 to give preferential treatment in the supply of inputs (and credit) to small farmers, to turn 'unviable' into 'viable' households. (A separate scheme for marginal farmers and agricultural labourers was later merged with it.) By building up the asset base, it is attacking vulnerability and poverty, but in some cases could make people more vulnerable as where SFDA lending has led to a debt trap, farmers being forced to go into private borrowing to repay the institutional loans. For example, 17% of the non-beneficiaries of the scheme stated possibility of getting deeper into debt as the reason for non-involvement. It is claimed that the scheme led to an improvement in income of most beneficiary households.[9] Most of the loans (86%) were given for medium term and long term purposes, i.e. asset building with a focus on agricultural investments or livestock. By its very nature it is small farmers who have been able to gain more than labourers. However, the main drawback (apart from inadequate coverage) of the scheme is the lack of maintenance and support services. To benefit from acquisition of new assets say cattle, one requires veterinary services, easy availability of fodder, good milk marketing which make the investment viable. It is these support services which Guhan calls "recovery disciplines" which would be the strong forces in lowering instability and failure to do this has limited the scope and impact of the programme.

The MEGS was launched in 1972, guaranteeing employment to all able-bodied adults in rural areas. Under this scheme, a group of 50 people asking for employment had to be provided work by starting a project within a 5 mile radius of their location. The ratio of

expenditure on the labour component as compared to other expenditure was stipulated to be at least 60%. Wages offered were lower than the legal agricultural minimum wage so as not to affect availability of agricultural labour. A dole of Rs 1/- a day was to be given if no employment was made available.

First, looking at the beneficiaries of this during the construction phase, which has a high wage component: of the employment created, 45% of those employed came from landless households and another 42% from households owning less than 5 acres of irrigated land. The Joint Evaluation report however suggests that quite a large number of non-target group people benefitted. Still, the two predominant reasons given for participation were better wages and absence of other work. Further about 42% of MEGS beneficiaries were found to belong to the scheduled castes and scheduled tribes, who are among the poorest.

Higher benefits have accrued to households with more working members. For example, total wage earnings averaged Rs 100/- where one worker was employed, going up Rs 500-2000/- where 3-6 members participated. In terms of age structure, one finds younger people working on the MEGS (who may be new entrants to the market, unsuccessful elsewhere). Interestingly a breakdown by sex reveals the participation of a very large number of women workers, at times nearly equal in number to male participants although the female wage continues to be significantly lower (Rs 607 per annum for women as compared to Rs 817 p.a. for men on the average though wage rates are meant to be the same). The differential between male and female wage rate is less on MEGS compared to alternative work. Most of the benefits from assets created go to the landowning classes.

The MEGS has been set up to provide year round employment and a minimum entitlement, providng a kind of basic legal security for the

unemployed, which can affect individual perceptions and behaviour, as well as real income. In practice, however, it has only provided employment in some seasons and not an alternative year round job which is what casual labourers would desire for ensuring security. Where it has supplemented off-season demand for labour, it has certainly been a stabilising force by lowering seasonal variations in employment (refer to Graph 5 in Appendices 2, 3 for evidence of contra-seasonal government employment). At the level of the market, the MEGS has not altered the wages, or strengthened competition, partly because it has not been year round and also because of setting a wage lower than the agricultural wage. In some areas, MEGS work has coincided with the main crop season and not been very beneficial. There also remains uncertainty about the period of employment, due to spatial spread and temporal discontinuity of projects.[10]

Despite a lower cash wage, the incorporation of a food component i.e. payment in kind has been one of the beneficial aspects. Payment in kind can minimise the direct vulnerability to under-nutrition. Dandekar has estimated that the food-for-work component of the MEGS has raised earnings by 33% or more for the workers. The conversion of kind payment in the form of ration coupons into grain is not always easy due to the absence of fair price shops in close proximity. Other problems include low quality of grain and often shortfalls in grain supply leading to an overdue on wage payments.

One of the major weaknesses of the scheme has been the timing of wage payment, which are determined on a piece rate basis and paid out after completion of the job. Many landless workers who did not participate reported that they were unable to wait for a week or ten days for payments to be made. This set of people who are most vulnerable to daily fluctuations in income are those ignored by this payment structure and a system of daily wages or advance payments

should be considered as a preferable alternative.

The biggest limitation of the scheme is that it supports a continued reliance on labour income alone. Apart from overlooking means of income diversification, it only caters to those who have adequate labour power. Households with sick or disabled members are completely bypassed. There is some income support available through the MEGS for households with working members but not for those burdened with a greater number of dependents. For example, data on Shirapur and Kanzara reflected an association of greater variability in incomes with higher dependency.

A brief report of the impact of the MEGS on women workers can throw more light on the type of beneficiaries. Nearly 50% of the women workers came from landless households, with an inverse relation between landholdling and duration of participation on the MEGS. Most of the participants were in the age group 30-50 and while 56% were wives, 23% were self head of households and 14% unmarried girls.[11] A high incidence of widows has also been observed among women workers. The MEGS has provided employment to women who may belong to more vulnerable households. Participation by women however remains limited by the male-female labour mix required for jobs (a given sex specificity of tasks), despite their eagerness to work, reflected in their readiness to leave home in search of employment.

The MEGS is one of the few attempts to provide minimum security through a guarantee of employment. It is only the first step in any attempt to prevent vulnerability arising from seasonal unemployment i.e. lower instability and improve recoverability. Provision of additional income (and employment) is just a part of what is needed. Provision against other risks such as health, nutrition being as important. Some thoughts on the directions that policies should take with this shift in emphasis have been outlined in this chapter.

Future research should collect evidence which establishes whether market (and other) adjustment mechanisms operate properly, and similar issues raised in this paper, thus helping in policy making.

5.4

To conclude, we emphasize once again the need for a perspective from the household level, to perceive better the problem of vulnerability before becoming an action oriented policy maker.

These words of Mang Juan, a Filipino peasant[12] speak for themselves:

"You must realize that we live in two different worlds. It is as if you live in the world of the birds of the air, and we in that of the fishes of the sea.

When birds move, they of course move fast because they fly. On the other hand, when we the fishes move, we move relatively slower because we have to swim in an ocean.

And so it sometimes happens that some birds want to do good for us from the height in which they fly. Condescendingly they say, 'Mr. Fish, progress! More like I do - this way and that way - so you could move faster!'

We fishes of course cannot follow because we have to move in this ocean of usury, and tenancy and other unjust relations ... "

ootnotes:

1. Sen (1981) discusses the role of the Government in contributing to the Great Bengal famine of 1943.

2. Universal declaration of Human Rights, 10 December 1948.

3. See V.M. Dandekar for the problems in establishing crop insurance in India.

4. A. Sen and S. Sengupta Malnutrition of rural children and the sex bias. Economic and Political Weekly Annual number, May 1983.

5. See Hu in Dernberger (ed).

6. Barah and Binswanger.

7. A successful case of drought management can be found in V. Subramanium's The Parched Earth, the experiences of the Mahrashtra drought of 1970-73.

8. The sources for this are Raj Krishna (1979), S. Guhan (1980), a MIDS study, and J. Heyer (1981), for SFDA and Dandekar and Sathe, D'Silva, Herring and Edwards, a ILO/ISST study and the Joint Evaluation report of the Planning commission on the MEGS.

9. Raj Krishna (1979). This remains a debatable issue.

10. See MIDS report.

11. From ILO/ISST report.

12. In Asian Action newsletter, Asian cultural forum on development, 1977.

APPENDIX 1*

GENERAL

Table 1: Distribution of households by occupation (1975-76)

Village:	Shirapur		Kanzara	
	Total	In Sample	Total	In Sample
Labourers	32.7	10.3	32	18.5
Cultivators	61.6	6.3	64.5	27.5
Others	5.7	0	3.6	0

Table 2: Occupational Distribution by main source of income (1975-76)

	Shirapur	Kanzara
Cultivation	39.7	49.1
Agricultural labour	42.8	37.9
Animal husbandry	1.0	-
Trade/shopkeeping	1.7	1.8
Rural crafts	1.3	3.6
Profession/Service	4.0	5.3
Remittances	5.4	1.8
Others	4.1	0.5

* The appendices mostly contain primary data.

APPENDIX 2

SHIRAPUR

Table 1: Deviations in rainfall during the monsoon season (June - September) in mms

Year	4 month total(mm)	Deviation from avg(%) (437 mm)	Deviation from prev. year (%)
1977	251.6	-42.4	
1978	565.3	+29.3	+124
1979	497.9	+13.9	-11.9
1980	340.3	-22.0	-31.6
1981	635.3	+27.8	+86.6
1982	332.0	-33.1	-47.7

Table 2: Income Composition and Variability (over 1977-80)

Landclass:	Labourer		Small Farmer	
Item	Mean	Between Year CV*	Mean	Between Year CV
1. Net household income	3206.1	47	3248.6	20
2. Livestock net income	367.3	65	1101.9	83
3. Labour income	2026.6	783	1547.6	19
4. Transfer net income	800.2	205	-61.5	699
5. Per capita income	699.1	57	781.8	45
6. Crop income	143.3	355	620	90

*CV = Coefficient of variation

Table 3: Wage Data (Average in Rupees per day) 1977-80

	Farm Wage Rate	Non-farm Wage Rate
Total	4.4	6.1
Male	6.5	6.4
Female	2.6	3.6
Child	2.6	3.6

Table 4: Asset position of labour households in 1977/78

Item	Mean Value (Rs) (x)	Within Group CV*
1. Land value	9578.5	83.3
2. Livestock value	390.9	110
3. Implements value	59.1	53.9
4. Building value	1028.5	74.8
5. Consumer durables value	500.4	28.6
6. Stock value	74.8	62.4
7. Financial Assets	200.0	37.8
8. Financial liabilities	287.7	76.0
9. Total assets	11632.2	140.0
10 Net wealth	11344.5	138.0

*CV = Coefficient of variation = $\frac{\text{standard deviation}}{\text{mean}}$ x 100

Description of Items: Land value includes land on which home is sited. Consumer durables include furniture, utensils, cycle, radio, clothing etc. and jewelry. Stock consists of bricks, bamboo, kerosene etc. Financial liabilities are mostly debt and some land revenue arrears.

Table 5: % Change in asset values for labourers and small farmers

Item	Labour		Small Farm	
	1977/8-1978/9	1978/9-1979/80	1977/8-1978/9	1978/9-1979/80
1. Land value	0	0	-0.9	0
2. Livestock value	-85.2	+115.6	+67.3	-34.4
3. Implements value	+2.3	+1.4	-58.2	+203.1
4. Building value	0	0	0	0
5. Consumer durables value	-0.3	-23.7	-32.5	+72.1
6. Stock value	-69.8	+146.5	+101.1	-63.0
7. Financial assets	0	+108.6	+0	0
8. Financial liabilities	+62.9	+15.9	+10.3	+3.0
9. Total assets	-6.1	+1.1	-0.6	+1.4
10 Net wealth	-10.9	+0.6	-1.3	+1.3

Table 6: Loans taken in cash as of July of given year (Rs)

Year	Labour		Small Farm	
	x	c.v	x	c.v
1. 1977	447.8	199	548.0	105
2. 1978	1531.5	157	190.6	97
3. 1979	1522.8	47	427.0	105

Table 7: Characteristics of poor and ultra-poor households (ranked in descending order by C.V of per capita income - PCY)

Ultra-poor i.e. PCY less than RS 600 p.a.

Rank	House hold Size	Sex ratio		Dependency	Family Structure	Per Capita Income
		Overall	Adults			
1	8	.6	0.7	0.6	N	320.5
2	8	1.6	1.0	0.6	N	350.3
3	5	.6	1.0	1.5	N	559
4	8	1	1.0	0.14	E	443.6
5	9	0.5	1.0	0.8	E	435.2
6	6	2	3.0	1.0	N	465.2

Poor i.e. PCY between Rs 600-800 p.a.

Rank	House hold Size	Sex ratio		Dependency	Family Structure	Per Capita Income
		Overall	Adults			
1	9	0.8	1.0	2	E	688.9
2	4	1	1.0	0	N	719.8
3	9	0.8	1.0	.1	E	669.8
4	6	0.5	2.0	0.5	E	756.6
5	5	0.6	1.0	1.5	N	622.8

notes: sex ratio = females/males
dependency = $\frac{\text{persons below 12 or above 60}}{\text{workers (12-60)}}$
E = extended, N = nuclear family structure

Table 8: Characteristics of households ranked by declining variability in incomes

Rank	House-hold size	Sex ratio		Dependency	Family Structure	Occupational Structure
		overall	adults			
1	5	0.7	1.0	1.5	N	AL
2	8	0.6	0.7	0.6	N	AL,L,C
3	8	1.7	1.0	0.6	N	AL
4	8	1.0	1.0	0.14	E	AL,L
5	9	0.8	1.0	0.13	E	AL,C
6	8	1.7	2.0	0.6	N	AL
7	9	0.8	1.0	2.0	N	AL,L
8	3	0.5	1.0	0.5	E	AL
9	6	1.5	2.0	1.5	N	C
10	6	2.0	3.0	0.5	N	AL,P
11	4	1.0	1.0	0	N	AL
12	9	0.5	1.0	0.5	E	AL,L
13	6	0.5	2.0	1.0	E	AL
14	5	0.7	1.0	1.5	N	AL

Table 9: Characteristics of households ranked by declining variability in asset values (including livestock value, financial liabilities and total assets)

Rank	House hold size	Sex ratio		Dependency	Family Structure	Occupational Structure
		overall	adults			
1	6	5	1	2.0	E	AL
2	5	0.7	1	1.5	N	AL
3	5	1.5	2	2.0	E	AL
4	6	2	3	0.5	N	AL,P
5	3	2	1	2.0	F	AL
6	9	0.5	1.5	0.5	E	AL,L
7	9	0.8	1	2.0	E	C,L
8	8	1	1	0.1	E	AL
9	8	0.6	0.5	0.6	N	AL,L
10	9	0.8	0.6	0.1	E	AL,P

notes: AL = agricultural labourer, C = cultivation, CR = crafts,
L = livestock activity, P = professional services
F = female headed household

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Table (i) Average days of employment in farm work (F) and Government work (G)

Month	Male		Female		Child	
	F	G	F	G	F	G
1	5.9	7.4	6.1	8	9.8	6.9
2	6.0	6.4	6.3	7	9.3	7.4
3	4.9	6.6	4.8	7.4	7.3	7.7
4	4.4	6.2	3.1	7.3	5.6	6.6
5	4.6	5.5	2.7	7.1	6.5	6.1
6	4.6	5.6	2.9	6.9	5.7	5.6
7	4.5	6.3	3.0	7.7	3.6	4.1
8	4.5	6.6	4.1	7.7	3.9	2.2
9	4.1	6.3	4.2	6.4	3.7	3.2
10	3.7	5.8	4.3	5.9	4.5	4.5
11	4.1	5.6	4.3	6.5	6.1	4.4
12	4.5	7.3	4.8	7.1	-	4.7

Table (ii) Seasonal wage rates for farm (F) and non-farm (N) work in Rupees per day

Month	Male		Female		Child	
	F	N	F	N	F	N
1	6.4	6.3	2.7	3.9	3.0	3.3
2	6.8	6.5	3.2	3.7	3.6	3.9
3	7.0	6.9	3.6	3.4	3.1	4.31
4	6.3	8.1	3.2	3.6	2.6	4.38
5	5.7	7.5	2.7	4.1	2.6	4.3
6	5.6	5.8	2.6	3.9	2.3	3.8
7	5.4	5.7	2.5	2.9	2.3	2.8
8	5.5	5.7	2.35	3.2	2.6	2.3
9	5.55	5.9	2.34	3.9	2.9	3.9
10	5.52	6.1	2.34	4.3	2.6	4.3
11	5.6	6.3	2.32	4.3	2.2	3.0
12	9.9	6.4	2.31	4.0	2.2	2.5

Table (iii) Wage Payments (Rs per day) on Farm (F), Non-farm (N), and Government (G) employment

Month	Male			Female		
	F	N	G	F	N	G
1	8.3	9.0	9.3	2.2	0.21	3.2
2	9.8	8.5	6.7	5.4	0.1	2.2
3	6.3	9.8	6.2	4.7	0.26	2.0
4	4.2	11.5	7.2	1.2	0.7	2.6
5	5.5	12.3	5.7	0.5	0.5	2.8
6	5.2	9.8	4.7	0.6	0.2	3.4
7	4.1	8.3	6.2	1.0	0.3	3.1
8	3.7	9.7	5.7	1.8	0.1	2.8
9	3.5	8.4	5.6	2.1	0.07	2.7
10	3.5	8.5	4.2	2.2	0.07	1.7
11	4.8	9.6	4.6	2.0	0.07	2.0
12	4.3	11.0	6.6	2.0	0.1	2.1

APPENDIX 3

KANZARA

Table 1: Deviations in rainfall during the monsoon season (June - September) in mms

Year	4 month total(mm)	Deviation from avg(%) (437 mm)	Deviation from prev. year (%)
1977	810.7	+.3	
1978	843.0	+4.3	+4.0
1979	828.0	+2.4	-1.8
1980	702.6	-13.0	-15.1
1981	1031.2	+27.6	+46.0
1982	631.6	-21.8	-38.7

Table 2: Income Composition and Variability (1977-80)

Landclass:	Labourer		Small Farmer	
Item	Mean	Between Year C.V	Mean	Between Year C.V
1. Net household income	500.5	160	1437.9	82
2. Livestock net income	106.0	221	204.5	192
3. Labour income	1829.3	81	2279.4	42
4. Transfer net income	84.1	150	187.2	241
5. Per capita income	125.7	134	269.8	94
6. Crop income	0	0	708	64

Table 3: Wage Data (Average in Rupees per day) 1977-80

	Farm Wage Rate	Non-farm Wage Rate
Total	3.9	6.0
Male	5.1	6.5
Female	2.5	2.1
Child	2.6	3.5

Table 4: Asset values of labour households in 1977/78

Item	Mean Value (Rs) (x)	Within Group C.V
1. Land value	285.7	265
2. Livestock value	113.1	222
3. Implements value	41.7	34
4. Building value	1885.7	105
5. Consumer durables value	718.7	71
6. Stock value	68.4	60
7. Financial Assets	51.4	119
8. Financial liabilities	688.8	242
9. Total assets	3113.2	84
10 Net wealth	3022.9	86

Table 5: % Change in asset values for landlesss and small farmers

Item	Labourers 1977/8-1978/9	Labourers 1978/9-1979/80	Small Farm 1977/8-1978/9	Small Farm 1978/9-1979/80
1. Land value	+49.9	0	0	0
2. Livestock value	+6.1	+99	+38.7	+.7
3. Implements value	-21.5	+25	+5.1	+13.0
4. Building value	0	0	+10.8	0
5. Consumer durables value	+39.8	+31.9	+25.6	-7.2
6. Stock	+29.7	0	+16.7	-0.4
7. Financial assets	-52.9	-61.4	-46.4	-80.0
8. Financial liabilities	0	-38.9	+10.8	-0.5
9. Total assets	+55	+2.5	+10.8	+0.5
10 Net wealth	+3.7	+13.4	+10.7	0

Table 6: Loans taken in cash as of July of given year (Rs)

Year	Labourers		Small Farmers	
	x	c.v	x	c.v
1977	85	24.9	221.6	113
1978	207.3	121	225.0	158
1979	154.4	126	138.0	82

Table 7: Characteristics of poor and ultra-poor households (ranked in descending order of income variation)

Ultra-poor i.e. PCY less than Rs 600 p.a.

Rank	House-hold size	Sex ratio		Dependency	Family Structure	Per capita Income
		Overall	Adult			
1	3	3/0	2/0	0.5	N	521.4
2	9	2	2	0.8	E	365.1
3	6	0.2	1	2	N	575.1
4	4	0.3	1	0.5	N	550.0
5	15	1.1	0.7	0.5	E	442.0
6	12	1.4	0.6	0.7	E	593.0

Poor i.e. PCY between Rs 600-800 p.a.

Rank	House-hold size	Sex ratio		Dependency	Family Structure	Per capita Income
		Overall	Adult			
1	4	0.3	1	0.3	N	658.6
2	6	1	0.5	0.5	N	653.1
3	4	3	2	1	N	647.0
4	12	1	0.6	0.7	E	643.0
5	6	0.5	2	0.2	E	727.0

Table 8: Characteristics of households ranked by declining variability in incomes

Rank	House-hold size	Sex ratio		Dependency	Family Structure	Occupational Structure
		Overall	Adult			
1	4	0.3	1	0.3	N	AL,C
2	6	1	0.5	0.5	N	AL
3	9	0.5	1	0.5	E	Cr
4	3	3/0	2/0	0.5	N	AL
5	5	4	2	1.5	N	AL,C
6	2	1	1	0	N	AL
7	15	1.1	0.5	0.5	E	AL,Cr
8	12	1.4	0.5	0.7	E	AL
9	6	0.2	1	2	N	AL,C
10	7	1.3	2	0.1	E	AL
11	4	3	2	1	N	AL
12	9	2	0.5	0.8	E	AL
13	4	0.3	1	0.5	N	AL
14	12	0.5	0.5	0.7	E	AL

Table 9: Characteristics of households ranked by declining variability of asset values (inluding livestock value, financial liabilities and total assets)

Rank	House-hold size	Sex ratio		Dependency	Family Structure	Occupational Structure
		Overall	Adult			
1	3	3/0	2/0	0.5	N	AL
2	2	1	1	0	N	AL
3	5	4	2	1.5	N	AL,C
4	4	0.3	1	0.5	N	AL
5	9	0.5	1.5	0.5	E	Cr
6	9	2	2	0.8	E	AL
7	4	3	2	1	N	AL
8	12	1	0.6	0.7	E	AL
9	5	4	2	1.5	N	AL,C
10	6	0.2	1	2	N	AL
11	4	0.3	1	0.3	N	AL,C
12	15	1.1	0.7	0.5	E	AL,Cr

Kanzara

Table (i): Farm (F), Non-farm (N) and Government (G) employment (days per month)

Month	Male			Female		
	F	N	G	F	N	G
1	7.0	9.4	7.0	7.1	6.9	5.6
2	7.5	9.7	8.1	6.8	6.3	5.8
3	7.8	8.9	8.8	6.3	5.2	7.4
4	6.9	7.6	8.0	5.7	4.0	8.4
5	6.4	7.2	7.9	5.6	3.7	8.3
6	5.6	7.6	6.4	6.1	4.6	7.2
7	4.7	8.9	5.6	6.9	0	7.0
8	4.9	9.6	4.9	7.4	0	5.9
9	5.5	9.5	5.5	7.8	2.6	6.5
10	7.2	9.0	7.8	7.7	0.6	9.6
11	8.5	9.0	8.7	7.9	0.6	11.3
12	8.0	10.2	8.1	8.1	0.5	10.8

Table (ii): Wage Rates for F, N and G work (Rs per day)

Month	Male		Female	
	F	N	F	N
1	5.3	6.4	2.2	1.8
2	5.3	6.9	2.4	1.6
3	5.3	6.9	2.3	1.7
4	5.5	6.6	2.1	2.0
5	5.6	6.6	2.1	1.8
6	5.4	7.2	2.2	1.6
7	4.1	6.9	2.3	-
8	4.5	6.5	2.5	-
9	4.6	6.3	2.6	-
10	4.7	6.1	2.7	3.7
11	5.0	6.0	2.6	3.1
12	5.3	5.7	2.3	2.3

Table (iii): Wage Payment for farm work and on total employment

Month	Male		Female		Child	
	F	T	F	T	F	T
1	10.3	18.8	4.9	6.1	4.7	6.1
2	12.2	20.1	5.3	6.1	4.4	5.8
3	12.7	23.7	4.3	5.3	4.4	5.8
4	11.7	23.7	2.7	4.0	4.1	4.8
5	12.8	24.2	3.1	4.9	4.3	4.6
6	11.8	22.2	6.1	6.8	7.0	7.2
7	9.4	16.9	9.0	9.2	8.8	9.0
8	8.1	14.9	11.5	11.8	8.8	8.8
9	9.2	16.3	12.2	12.7	7.0	7.1
10	12.5	17.8	10.5	11.1	5.7	6.6
11	14.5	21.6	8.9	9.4	5.9	7.7
12	13.3	18.9	7.4	7.8	5.3	7.2

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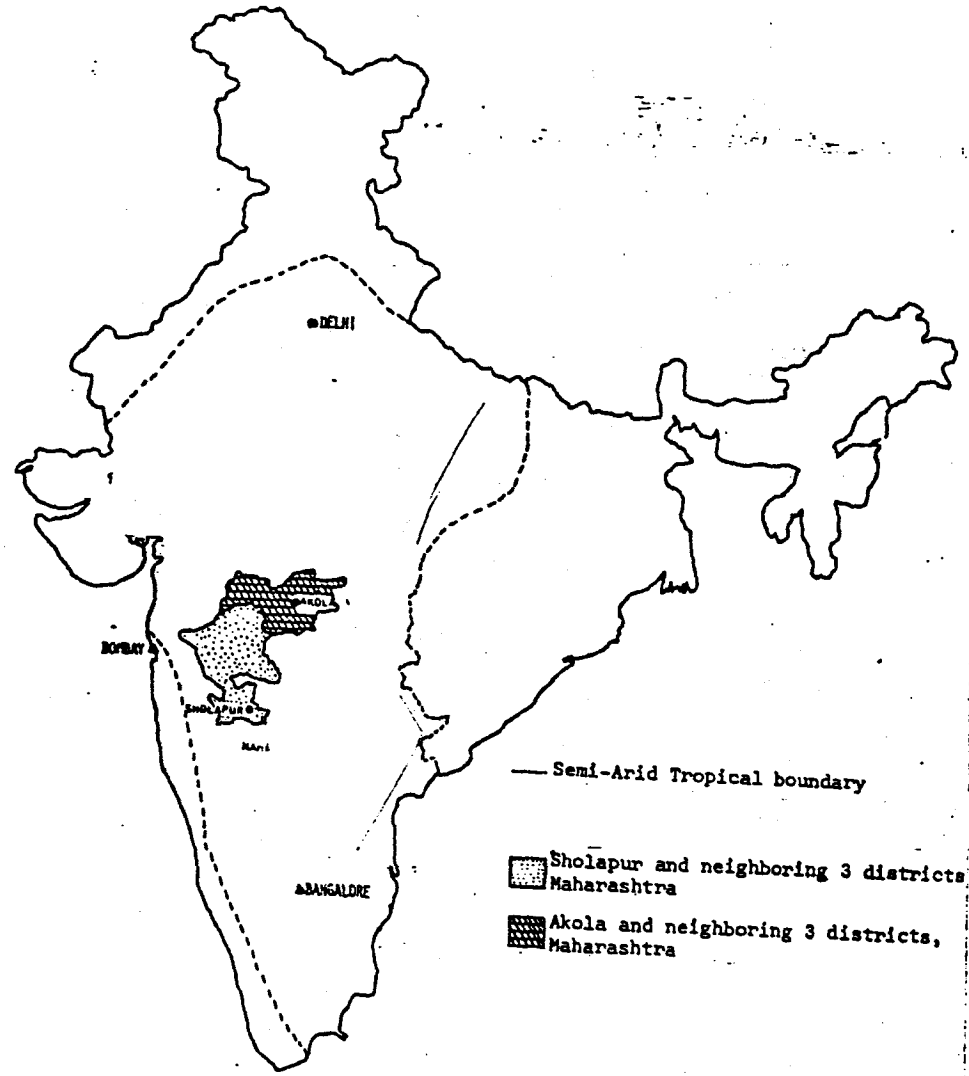
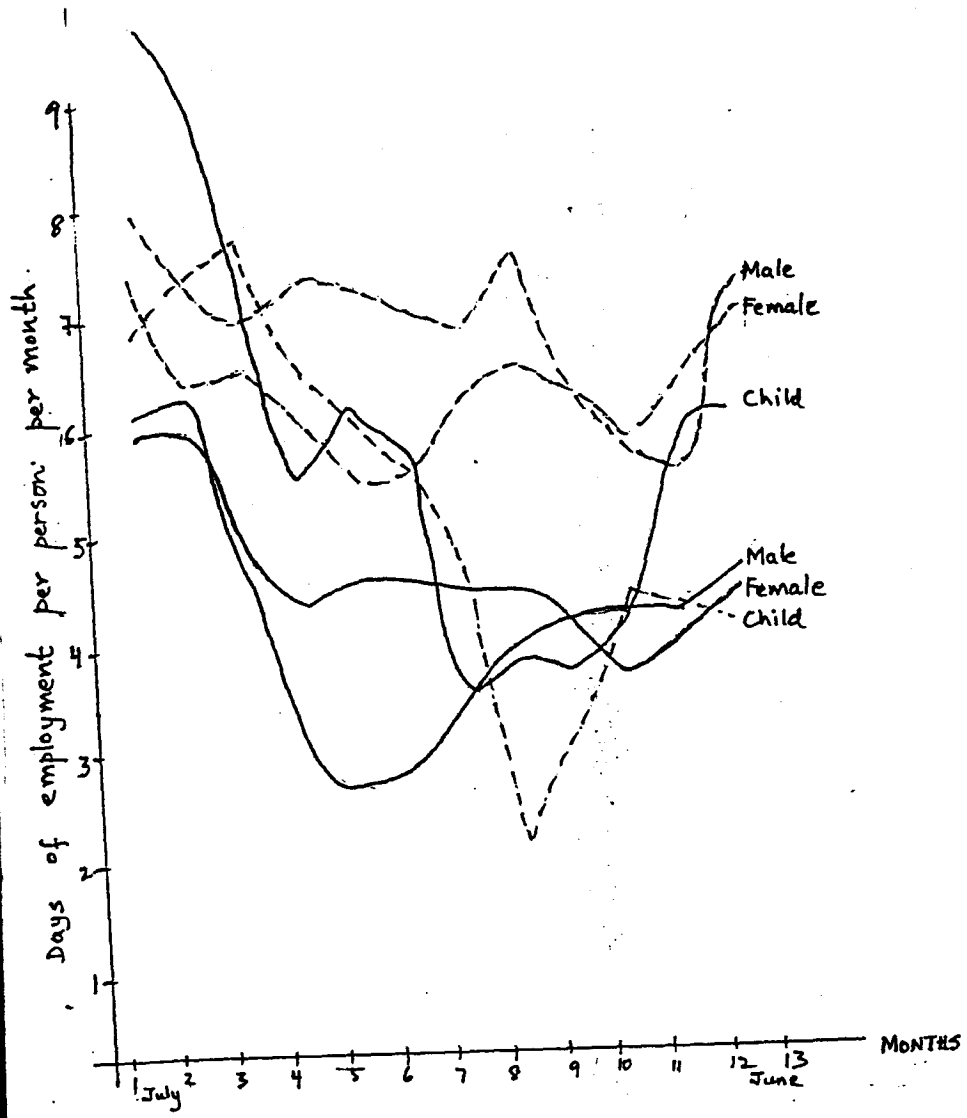


Map 1 Villages Shirapur and Kanzara are in Sholapur and Akola districts respectively.

——— Farm and - - - - Government

Employment Days

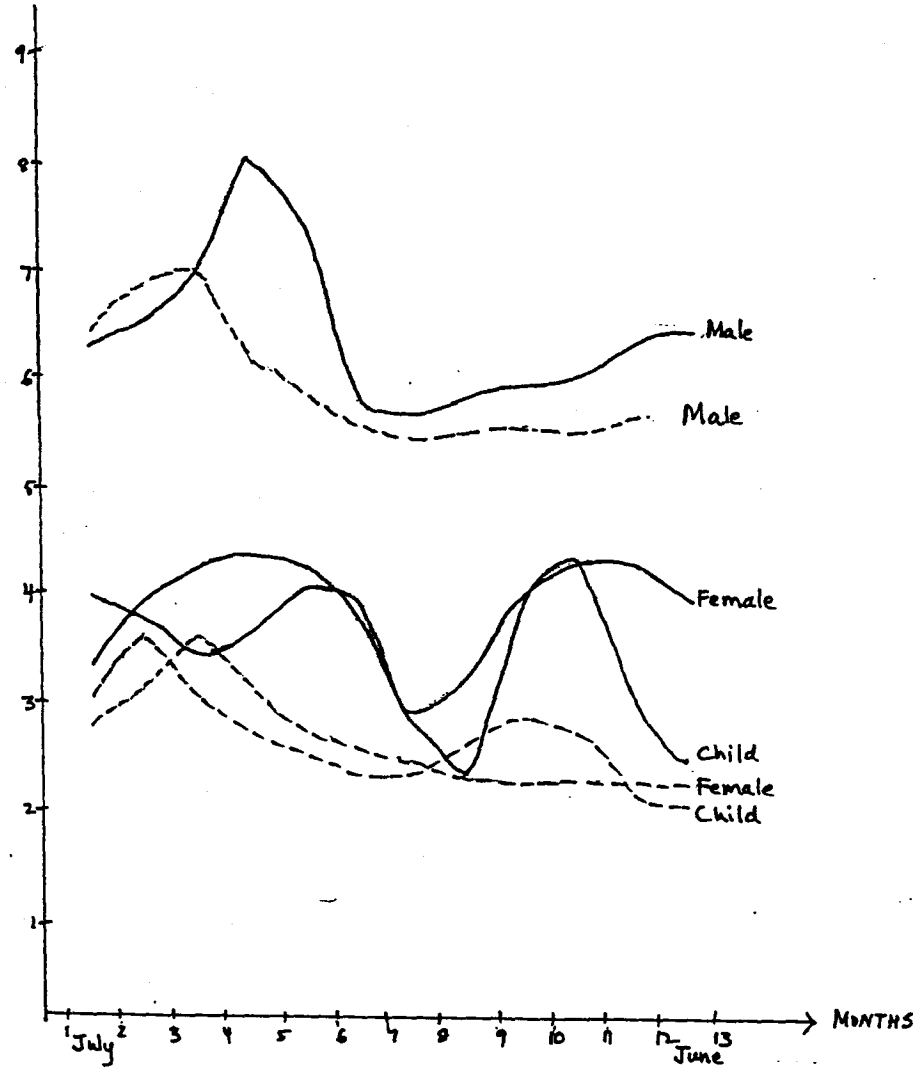
Graph 1



Wage Rates in Shirapur

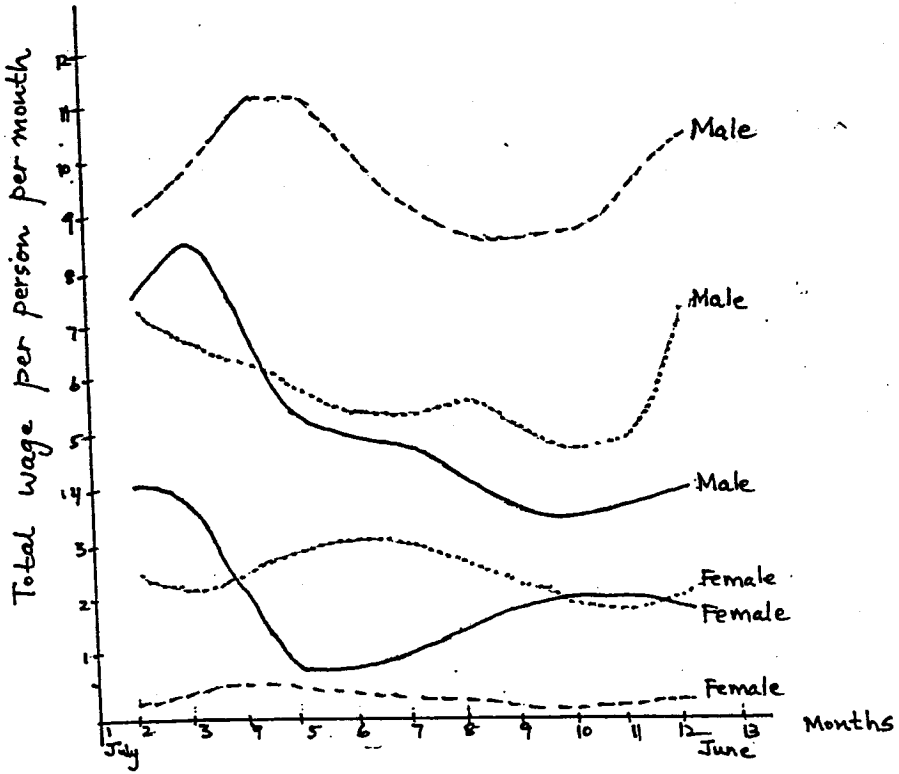
Graph 2

------ Farm ——— Non-farm



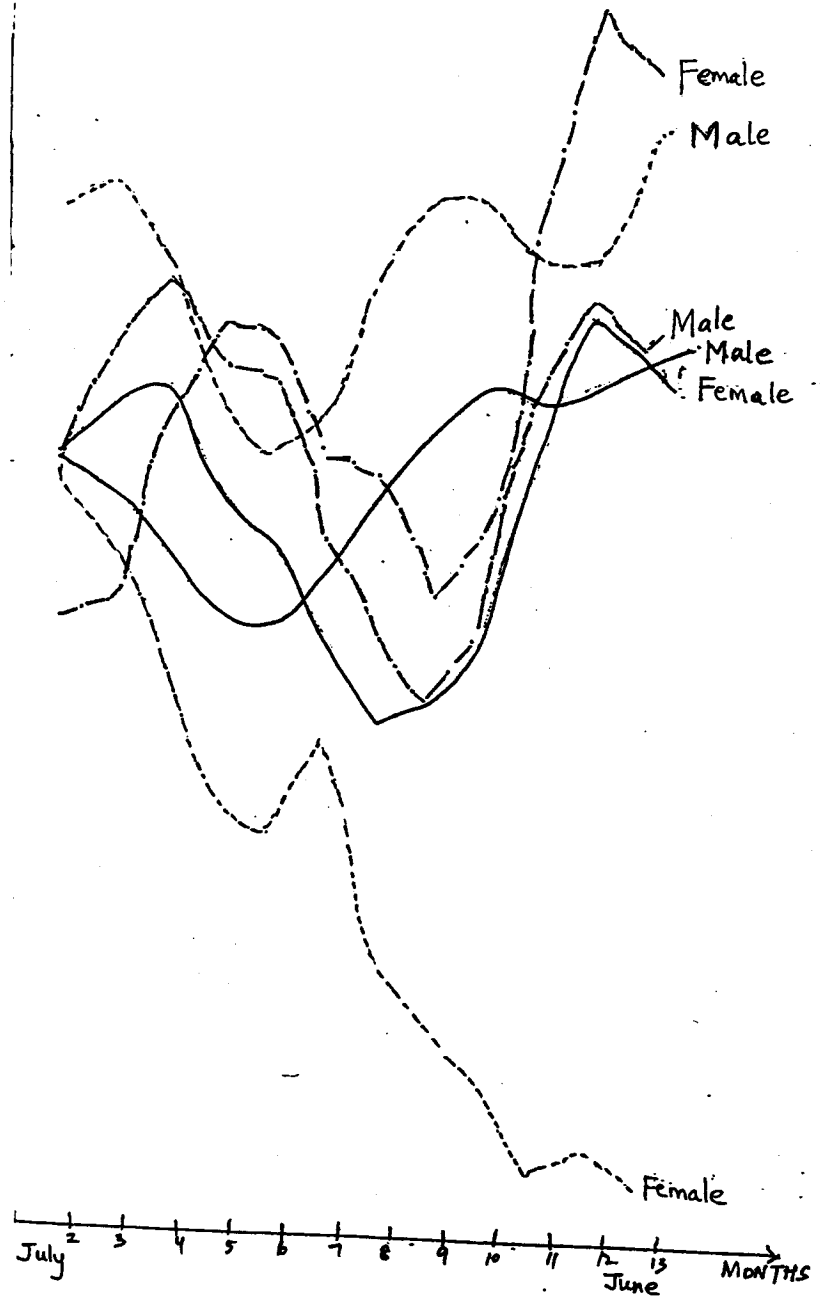
Graph 3

Total Wage Payments in

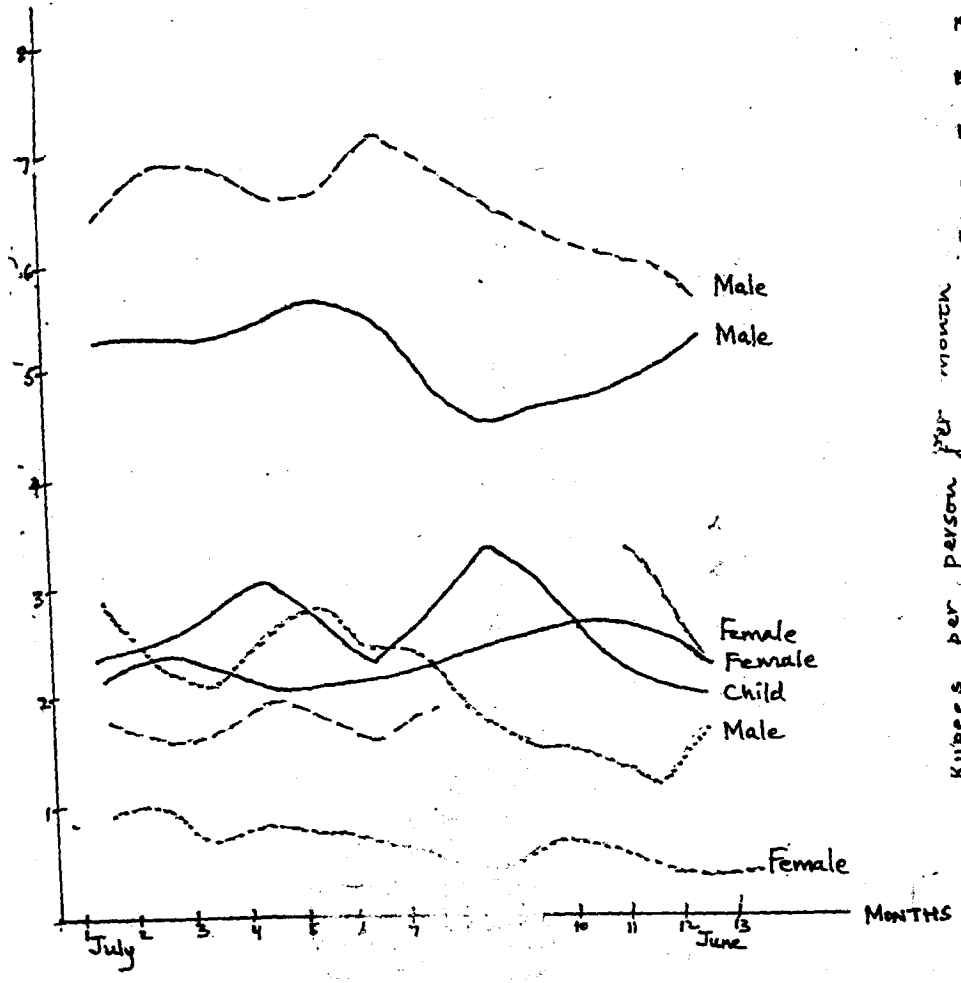


Farm ------ Non-farm —·—·— Government

and Tanza



Graph 2 ——— Farm - - - - Non-Farm ..... Government Wage Rates in K



Graph 3 Wage Payments in Farm (---) and Total (—) work in Kanza