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Access to Laud and Child Survival: Some Research Issues

IN agricultural societies stratification systems which determine the power, status, and wealth depend on the size of the land. Because of this land-redistribution and land reform are important policy objectives in development planning. Even though the importance of land to rural socio-economic structure, has long been recognised, it has not yet been given adequate importance in demographic literature. It is true that the access to land and fertility behaviour relationship has been examined in a number of studies in developing countries. Many of these have been reviewed by Mueller and Short (1983), Stokes and Schutjer (1983, 1984), Stokes, Schutjer and Bulatao (1986) and Cain (1985,1986). On the other hand, only a limited number of studies linking access to land to child survival are available. This paper reviews some of the scattered emprical work on this relationship. First, a theoretical consideration for the relationship between access to land and child survival is presented which provides a basis for a review of available studies.

Theoretical Considerations

Before presenting the relationship between access to land and child survival, the way in which such relationships emerge must be noted. The relationship between the economic resources of the child's family and child survival has long been recognized (Mosley and Chen, 1984; Jain, 1985). According to the analytic framework of Mosley and Chen (1984) for analysing child survival in developing countries, socio-economic factors operate through a set of proximate determinants of morbidity and mortality. Among the socio-economic variables, household level variables (income/wealth) operate on child health and mortality through such proximate determinants.

For the landholders availability of food is associated with the size of holding. Therefore, it is possible that the farm households that produce the food that they consume has positive nutrient response and child survival. But landless and small peasants will spend most of their income on food. Quantity and quality of food intake among them depends on their income from agricultural wage employment and price of the food. In peak seasons they can earn more, but in slack seasons there may be a decline in their income. This variation in their

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flow of income probably worsens their nutrient intake and thus the prospects of child survival. Food surplus and scarcity seasons are typical in agrarian societies. Although food availability among landholders depends on cropping patterns, quality of the harvest and the rainfall, they can manage the food crisis even in hard times or in poor harvest seasons by leasing some of the land to others or by mortgaging. For them land is a store of wealth for crisis period.

Preventive and sickness care are important factors in determining the child survival. Good health of a child requires mother's time for food preparation, bathing the child, washing the cloth, house cleaning, feeding, sickness care and visiting the clinic. In agrarian societies mother's time may also be needed for economically productive activities. Under such circumstances child care often competes with the time needed for income producing activities. For landless labourers and small land holders a mother's work outside the home may adversely affect child care which would get less time or be handled by less skilled siblings. Hence, the differentials in productive activities between landholders, small peasants and landless may produce childcare differentials and thus influence child survival.

Income and wealth is said to be positively associated with maternal and child health and nutrition and child survival. Access to land can also affect child survival indirectly via income, because of its strong correlation with income. Increased income from land facilitates better housing, food, clothing, quantity and quality of water used, better storage of foods, increased media information about nutrition, hygiene, contraception, immunization, and preventive/sickness care.

Landholding is related with the exposure to the soil, crops and livestock. These exposure variables may have an influence on child survival. For example, when children walk and play around bare-footed on the fields, they are exposed to the risk of certain infectious and parasitic diseases. Not only children but also women who work in the fields, particularly during the transplantation of crops, have to work in deep water or in wet soil. This again exposes them to diseases related to soil borne organism (Khan, 1988).

Usually in farm households livestock shed is also situated adjacent with the household. Livestock stools around the house pollute its environment and increase the risk of infection due to associated organism like mosquitoes, fleas etc. Modern farming is associated with increased use of chemical- fertilizers and pesticides which are often stored at home and children's exposure to these may increase the risk of disease.

Thus, access to land can influence child survival in a number of possible ways. Not all of this may operate in the same direction and the net effect may be the result of a combination of certain parallel and counter effects. For a clear understanding of the land-child survival relationship both the overall effects and the intermediate paths need to be examined. Therefore, the present review is divided into two parts. First, the empirical evidence on the overall effect of access to land on child survival is reviewed. This is followed by a review of studies that have examined one or more relevant intermediate variables.

Evidence on the Effect of Access **to Land on Child Survival**

Some of the field studies conducted in India as well as in many other countries have provided an indication of differentials in infant and child survival by land ownership. Naturally for such an examination only studies in rural areas are relevant. In many studies

mortality differences between landless and landowning rural populations are discussed. In the Mysore Population Study that was conducted in the early 50' s in the Mysore state, it was found that labourers and 'temporary tenants' had the highest infant mortality rate over 67 percent higher than owner cultivator fanning over 3 acres of land or 'permanent tenants' with over 5 acres (U. N. 1961). Based on the 1951 Indian Census data Natarajan (1980) reported that proportion of children dying before the age of 5 was 10 percent higher among farm labourers than among farm operators in Madhya Pradesh and 42 percent higher in Kerala. A survey in Andhra Pradesh by the Council for Social Development showed that the owner cultivators and tenant cultivators had lower infant mortality rates than agricultural labourers (Vaidynathan, 1972). Child mortality estimates of 1981 census show that infant and child mortality among cultivators is clearly less than that of agricultural labourers for India as a whole and for the States (Registrar General, 1988). Ramanujam (1988) observed higher post neonatal mortality among agricultural labourers than cultivators in various cultural groups of Tamil Nadu. In Bihar, agricultural labour, casual and attached, have a higher proportion of children died than middle and large peasant (Rodgers et al, 1989). In Kerala, child mortality among cultivators is less than that of agricultural labourers (Bhat and Irudayarajan, 1990). All the above studies clearly indicate the higher infant and child mortality among landless than their landed counterparts. But Reddy et al (1988) found a higher infant mortality among cultivators than agricultural labourers in one district of Karnataka. But in other districts infant mortality among cultivators was found to be lower than among labourers. Also the child mortality was higher among cultivators than agricultural labourers in all the districts studied.

Size of landholding has also been examined in some studies. Ramanujam (1988) did not find any correlation between size of land and infant mortality in Tamil Nadu. In Rajasthan, households owning more than 5 acres of land have lower infant mortality than those owning less land or no land at all. There is aclear negative relationship (Kanitkar and Murthy, 1988). In Bihar, level of child mortality is not closely related to the size of land owned. Though distinctly higher child mortality among landless was observed (Rodgers et al, 1989). In Karnataka, Shariff (1989) did not find any close association between landholding and proportion of children surviving. At the same time Baskara Rao et al. (1986) found higher infant and child mortality among large landowners than those with less land in various years. However, according to the authors this pattern is due to higher mortality in one particular district which has more large landowners in the sample.

Information on landholding and child survival relationship is available from studies out side India also, Stys (1959) found a positive relation between number of children deceased and size of farm among two generations of Polish peasant women, but this was influenced by differential fertility. The relationship between farm size and child mortality rate was found to be negative. In Bangladesh death rate among children in a famine year in landless families were over 3 times those of families with more than 3 acres of land. Considerable differences were also observed by landholding size (McCord, 1977). At the same time, McCord et al. (1980) found a relatively high infant mortality among children of largest holders in Bangladesh whereas Chowdhury (1981) and Cain (1978) did not find any correlation between landholding and child mortality. But Cain (1978) found distinctly higher

male adult mortality among landless than landed classes. D' Souza and Bhuiya (1 982) found clearly higher mortality in all major age groups among agricultural labourers than owner cultivators in various years. Amin (1988) reported that in Bangladesh landownership is associated with lower infant mortality in 1975 and the effect to be insignificant in 1979.

In Pakistan, the relationship between size of iandholding, tenurial status and infant mortality did not vary systamatically by size of holding or tenurial status of the households. Noticeable higher mortality among landless agricultural labourers was observed (Man, 1989). Infant mortality was found to be negatively related to the size of land owned and positively to the size of land cultivated in Brazil (Chemichovsky, 1976). In Nepal, largest landholders have cosistently higher proportion of surviving children than those with less land (Thuladhar and Stoeckel, 1983). In Brazil, farm size and child survival is positively related (Merrick, 1981).

Child survival and access to land in these studies reviewed above reveal a higher infant and child mortality among landless than cultivators with few exceptions (see Table- 1). But studies linking size of land and child survival have failed to arrive at a consistant relationship.

TABLE i— INFLUENCE OF LANDHOLDING ON CHILD SURVIVAL: RESULTS FROM VARIOUS STUDIES

Author/Year	*Nature of Study*	*indicators Used*	*Landless*	*Small Cultivators*	*Large Cultivators*
U.N., 1961	Mysore Population Study (sample survey)	q(1)	159	123	95
Centre for Social Development. cited in Vaidyanathan, 1972	Shadnagar Standard Fertility Survey (sample survey)	q(1)	101.4	104.4	
Natarajan, 1980	1951 Census of India	q(5)	Mortality 10% higher than cultivators in Madhava Pradesh Mortality 42% higher than cultivators in Kerala		
Baskara Rao etal, 1986	Kamataka Fertility Survey (sample survey)	q(5)	1965-'69 - 1970-'74 -	156 130	147-156 139-159
Reddy et al. 1988	Baseline Survey in Kamataka (sample ssurvey)	q(1)	73.2	81.4	
		q(5)	21.6	36.3	
Registrar General, 1988	1981 Census of India	q(2)	157	126	

Table 1 (continued on page 151)

Table 1 *(continuedfrom* page 150)

Author/Year	*Nature of Study*	*Indicators Used*	*Landless*	*Small Cultivators*	*Large Cultivators*
Ramanujam, 1988	Sample Survey in Tamil Nadu	Neonatal Mortality, Post Neonatal Mortality	High mortalaity is not related 131	Low Size of land and 141	
Kanitkar and Murthy, 1988	Sample Survey in Bihar and Rajas-than	q(1)	Size of land is negatively associated with neonatal, post neonatal and infant morality		
Rodgers et a! 1989	Sample Survey in Bihar	Proportion of Children died	0.20-0.24	0.18-0.13	0.17-00.20
Shariff, 1989	Village Survey in Kamataka	Proprotion of children surviving	0.833	0.811	0.842-0.848
Chemichorsky, 1976	Village surveiy in Brazff	q (1)	Negatively related with area of land owned Positively related with area of land cultivaated		
McCord, 1977	Sample Survey in Bangladesh	q(5)	92	48-46	26
Cain, 1978	Village Survey in Bangladesh	Proportion of children who have died	.25	.25	.27
Merrick, 1981	1970, Brazilian Census Data from 106 Micro Regions	Percentage of children surviving	Positively relate	•d with median size ol	ffann
D'Souza and Bhuiya, 1982	Sample Survey in Bangladesh	*q(5)*	42.9	- 27.5	15.9
Tuladhar and Stoeckel, 1983	Sample Survey in Nepal	Proportion of children ever born surviving	Hilly area 78 Terai area 76	81 79	83 81
Amin, 1988	1975, World Fer-tility Survey and 1975, Contracep-tive Prevalence Survey in Bangladesh	q(1).q (5)	Land ownership was associated with lower mortality in 1975, and the effect to be insignificant in 1979		
Wan, 1989	Sample Survey in Pakistan	Percentage of Children dead	15.46 Owner operator Share cropper	13.35-11.67 12.09-09.70	12. 44-12.20 16.94-14.21

Note: Sources for the studies quoted in column 1 are given in references. *q(x):* Probability of children dying before age *x.*

The Role of Intermediate Variables

As mentioned earlier, the effect of landholding on child survival would operate through one or more intermediate or associated variables. Some of these like income and education are socio-economic, whereas the others like nutrition and health care are proximate variables as in the Mosley and Chen (1984) framework. In this section, the empirical evidence on such intermediate links is reviewed.

For the landholding families an increase in the price of farm products will have a positive impact on nutrient intake. Behrman and Deolalikar (1988) estimate the price elasticities of annual nutrient intakes for boys, girls, men and women of rural South India. Of the four basic food studied, the nutrient intake responses to the price changes for millet, rice, sorghum and pulses are positive. This result suggests an indirect positive effect of landholding on child survival.

Land will affect child survival indirectly via education, particularly maternal education because educated mothers are found more oftenly in landholding families than landless families. Education known to be an extremely important determinant of child survival even after controlling for income and wealth of the households. Therefore, if landholding and education are positively associated atleast a part of the observed effect of land on child survival would be attributed to this association. In such cases, the land-child survival relationship may appear to be higher than the direct effect, unless there is cause and effect relationship between land and education.

In India, landholding and household size are positively associated and family nucleation is more prominent among labourer households than among households owning large landholdings (Krishnaji, 1980). Due to the largeness and jointness of the large landholder households, elders or grand parents are readily available for child care. The quality of the child care provided by the elders is significantly different from the care of the young siblings. Hence child survival among landholders may be higher than among landless households which would often suffer due to the lack of another able person to care for the child.

Some studies have evidenced the better health and nutrition of the children among the landholding families. Sathayanarayana et al. (1986) found the remarkable influence of land on this in Andhra Pradesh. About 45 percent of the children in landlord classes had normal nutritional status and only one fifth had moderate or severe under nutrition at the fifth year of life. But among landless, only 15 percent of the children of this age had normal nutritional status and more than half suffered from moderate and severe under nutrition. Chernikovsky and Kielmann (1977) reported that the amount of land cultivated by the child's household was positively related with the child growth (in terms of weight and height) and nutrient intake (in terms of calories and calcium) in Punjab. Also, they have found that landowners and those cultivating more land have taller and heavier children. The children from landholding families were also found to consume more calories than the children of landless labourers but the difference was not significant.

The above studies indicate the access to land is a correlate of child's nutritional intake and health. Mother's health is also an important factor in peasant societies for child survival; maternal health is one of the important proximate determinants in Mosley and Chen' s (1984) framework. Nag (1988) reported that literature on infant mortality in India generally mentions that heavy physical work by pragnant mother increases the risk of infant mortality

through premature labour- and low birth weight babies and other factors. Landownership could influence the demand on the physical work of the mother and thus in turn maternal health and infant mortality. Khan's (1988) in-depth analysis of the work schedule of five pregnant women in rural Uttar Pradesh shows that labour intensive family activities associated with poverty hardly allow them to take rest or proper food. Low calorie intake among them create severe malnutrition leading to perinatal mortality and delivery of a low birth weight babies. Cain (1978) and D'souza and Bhuiya (1982) found a higher adult mortality among landless than owner cultivators in Bangladesh. Hence, there is a reason to believe that among landless and small holders severe labour demand on the mother combined with low nutrient intake and less attention to child care reduces the chances of child survival. Further, higher adult mortality implies earlier widowhood and widowerhood. Death of any one of the partners will severely affect their income flow and food intake and child care and thus adversely affect the prospects of child survival.

In this review, some studies show a higher mortality among cultivators (Reddy et al. 1988) and large landholders (McCord et al. 1980; Baskara Rao et al. 1986). As already noted agricultural households are exposed to some of the risk factors. For example, exposure variables for neonatal tetanus in Utter Pradesh showed that presence of the large draught animals in the household is positively related with neonatal tetanus (Smucker et al. 1980). Hence, high infant and child mortality is possible among large holders because of the association between sizable land-holdings, ownership of large draught animals and neonatal tetanus (Ware, 1984:198).

Summary

This review shows that whereas the effect of landownership on child survival has generally been found to be positive, though there are some exceptions, there has been inadequate work on the understanding of the mechanism through which this operates. It must be noted that most of the studies were not specifically designed to investigate the land-child survival relationship. Naturally, often land was one of the many explanatory variables considered. In most of the studies, the effects of associated variables like education were not controlled. Further, it is not clear whether some of the effects operating via income and family composition are attributable to access to or size of landholding.

Another important limitation of most of the reviewed work is that the proximate determinants were not specifically incorporated. The Molsey and Chen (1984) framework and the improvizations or alternatives suggested by Jain (1985), Talwar (1988), and Nag (1988) are very recent developments. Some of the proximate variable suggested did enter some analyses, but the complete framework was not adopted. Often only partial links between landholding and some of the associated proximate variables were studied.

Research Issues

Further research should give importance to how land is measured. In most cases simple subdivision as landholder and landless will not be appropriate. Also, data on different land tenure patterns and land quality are needed, because income depends on the quality and ownership of land. There is often a tendency to use ownership and landholding interchan-

geably. Some of the effects of the land may be due to income derived out of it, which would accrue to landowners or tenant cultivators in varying degrees. Further, demands of labour and exposure factors would affect only owner-cultivators and tenant cultivators but not those owners who lease out land. Since it would be difficult for a single study to examine the various types of access to land, it may be appropriate to carry out investigations by holding quality and tenure constant.

It would be ideal to adopt the proximate determinants framework in studies on the effect of land. Specifically it would be investigated whether and in what manner access to land influences maternal health, environmental contamination, utilization of preventive and curative services etc. Since some of these effects could be via or jointly with income, education, and household composition, it would be necessary to make attempts to assess the direct and indirect effects of access to land on child survival.

Certain aspects of landholding would affect the risks differently at different periods—gestation, birth, neonatal and post neonatal periods. The frameworks of Jain (1985), Talwar (1988) and Nag (1988) permit such an exploration. Research efforts along this line could provide more clear cut suggestions for policy interventions. In predominantly agrarian socities like India even a partial success in such an effort would be extremly valuable.

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