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INTERGENERATIONAL MOBILITY IN LANDHOLDING DISTRIBUTION OF RURAL BANGLADESH

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ABSTRACT

The main concern of this paper was to examine the changes in the distributional pattern of landholding over the last three generations. The Markov chain model of order one has been used for our study and then test of hypothesis was performed to examine whether the observed process is a realization of Markov chain of order one along with the test for stationarity of the landholding distribution. In order to predict the landownership sizes after one, two, or more generations, transition probability matrix was estimated. From the estimated limiting behavior of the transition probabilities of landownership size classes between the generations the stationarity condition was examined and at what generation there *will* be no changes in landholding distribution was determined.

I. INTRODUCTION

In most of the developing countries, land is the productive asset and it is the main respiratory of wealth, dominant means of production and important determinant of social status in the rural society. The control over land affects the structure, angle of vision, and interrelationship between the households of the rural society. The rules, regulations, and reforms of agro-based society depend largely on the nature of land distribution. The ownership of land directly affects income earning opportunities and welfare of a family. On the other hand, landless households are rarely found to be self-sufficient and they have no access to services for raising income including rural credit. In Bangladesh, majority of the rural households belong to small farm and landless households. The landless households increased from 8 percent in 1983-84 to 10 percent in 1996 (B.B.S. 1999).

Ownership of land is an important determinant of poverty among rural households. Unfortunately, this is also an area where the dynamics of the growth process is unlikely to operate in favor of poorer households. On the contrary, in a situation where land is already scarce and demographic pressures are mounting, one would expect to see continuing fragmentation of landholdings for most categories of landholders, with a consequent increase in both landlessness and the extent of marginal farm holdings. Growing pressure of population on land also weakens the position of small tenant farmers, especially in a situation where tenancy reforms have either not been carried out or are ineffective. The land (in acres) : man ratio decreases from 0.27:1 in 1983-84 to 0.17:1 in 1996. (B.B.S. 2002)

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II. SOURCE AND NATURE OF DATA

The present analysis is based on 200 sample households spread over 4 villages from Matlab thana of Chandpur district which were taken at random by simple random sampling method. The fieldwork was continued throughout the month of December '2001. On average about 50 households were selected at random from each selected village for an in-depth survey. Due to shortage of financial resources and budget constraint, data with wider coverage could not be collected for this study. Though the sample size is small, yet special attention was paid during plot wise data collection. Household information was collected by personal interview approach, because in this case investigators could contact the respondents personally and obtain the required information accurately by putting questions directly to the respondents. Data on size of arable land owned, land inherited from father after his death, the size of land owned by father (when father was the head of the household) and the size of land owned by grandfather (when grandfather was the head of the household) were recorded for each household. Probing was an important tool in this survey. In most cases queries concerning household history, source and nature of acquisition of land owned currently, land inherited, transfer of landownership etc. were made to the oldest member of the household in an attempt to improve the quality and reliability of the data.

III. METHOD OF ANALYSIS

The methodology used in this study is designed to explain the intergenerational process of transformation of landholding from father to sons by Markov chain model. Because of Muslim law of inheritance, frequent river erosion, and distress sale of land due to poverty and vagaries of nature (flood, draught, famine, etc.), the movement of a household from one landholding size group to another is somewhat irregular, multidirectional, and random in nature. The future status of a household in terms of landholding size cannot, therefore be predicted with certainty but it can be done only in a probabilistic framework. Due to this problem and because of near impossibility of getting reliable information on landholding sizes of three or more generations ago, we have in particular, used the first-order Markov chain model which assumes that current outcome depends only on the previous state and not on those of the further past.

We will in particular be testing the order of the Markov chain to be sure that our analysis is eligible. Suppose that one wishes to test the order of a chain then he can easily use the maximum-likelihood estimates. For testing the null hypothesis that the chain is of order zero, i.e.,

$$H_0: P_{ij}^{o} = P_j \quad ; \quad \text{For all } i,j = 1,2,\ldots..m$$

against the alternative that the chain is of order 1, the test statistic developed by Anderson and Goodman (1957) and as propounded by Bhat (1984) under null hypothesis is given by

$$-2\log\Lambda = 2\sum_{i=1}^{m}\sum_{j=1}^{m} n_{ij}\log\frac{(N)n_{ij}}{(n_{i.})(n_{.j})}$$

which has an asymptotic χ^2 distribution with $(m-1)^2$ degrees of freedom.

We will then be testing the stationarity of the transition probability matrix got from the transition probabilities. Let P_{ij}^{t} be the one step transition probability of a time-dependent process X(t), such that

$$P_{ij}^{t} = P\,[\,X(t+1) = j \,/\, X(t) = i]$$

Suppose we wish to test the null hypothesis

$$H_0 : P_{ij}^{t} = P_{ij} \quad (t = 1, 2, \ldots, T)$$

As propounded by Bhat (1984), under the null hypothesis H_0, $-2 \ln \Lambda$ has a χ^2 distribution with $(T-1)[\,m(m-1)]$ degrees of freedom.

In this case $-2 \ln \Lambda = 2\,[\,L(\hat{P}^{t}) - L(P)\,]$

$$= 2 \sum_{t=1}^{T} \sum_{i=1}^{m} \sum_{j=1}^{m} n_{ij}^{t} \ln \frac{n_{ij}^{t}}{n_{i}^{t-1} p_{ij}}$$

For the present context, the Markov chain $\{X_n\}$ is defined in terms of land ownership holding under the assumption that the probability of land holding of son depends on the landholding of father. In other words, intergenerational transformation of landholding from father to son constitutes a first order Markov chain. Let us consider a Markov chain with state space S {S = 0, 1, 2, 3} representing Landless (LL), Small farm (SF), Medium farm (MF), and Large farm (LF) respectively. The category boundaries were: LL = Owning no arable land, SF = Owning arable land less than 2.49 acres, MF = Owning 2.5 to 7.49 acres of arable land, and LF = Owning 7.5 acres or more of arable land. The focus of the present analysis is therefore, restricted to ownership holding only. The choice of these categories is done according to the nationally accepted classified groups.

As a next step, limiting behaviors of transition probabilities have been examined as propounded by Feller (1968), using Chapman-Kolmogorov equation. We can have by recursive relation $\left\| P^{(n)} \right\| = P^{n-1}.P = P^{n}$

If n is large, P^{n} is then equivalent to

$$\lim_{n \to \infty} P^{n} = V = \begin{bmatrix} v \\ v \\ v \\ v \end{bmatrix}$$

where each $v = (v_0, v_1, v_2, v_3)$ with $0 < v_j < 1$ and $\sum_{j=0}^{s-1} v_j = 1$.

Then probability vector V satisfies the relation VP = V, which gives the desired limiting distribution of the process. In other words, as $n \to \infty$, $P^{(n)}$ tends to a limit v with elements v_j independent of the initial state i. This is called the stationary or equilibrium distribution.

IV. DYNAMICS OF LANDHOLDING DISTRIBUTION

A close analysis of size class and distribution of landholdings presents a very uneven character which presupposes the most skewed distribution of land. The position regarding distributional pattern of farm households may be viewed in Table 1. As shown in Table 1 small farm households operating up to 2.43 acres of land constituted about 52 percent in 1960, 70 percent in 1983-84 and 80 percent in 1996 of the total farm households. According to the 1996 Agricultural Census Report, the small farm holdings (80%) operated only 42 percent of the total operated land; the medium farm holdings (operating 2.50 to 7.49 acres of land) constituted 18 percent of the total farm holdings and shared about 42 percent of the total farm area.

Table 1. Distribution of Farm Households and Their Operated Land by Size in Different Agriculture Census Years (Figures in '000).

Items	Agriculture Census Year			% change in 1983-84 over 1960	% change in 1996 over 1960	% change in 1996 over 1983-84
	1960	1983-84	1996			
Total farm household	6148 (100)	10045 (100)	11798 (100)	(+)63.4	(+)91.9	(+)17.5
Small farm	3179 (51.71)	7066 (70.34)	9423 (79.87)	(+)22.3	(+)196.4	(+)33.4
Medium farm	2315 (37.62)	2483 (24.72)	2077 (17.61)	(+)7.3	(-)10.3	(-)16.4
Large Farm	656 (10.67)	496 (4.94)	297 (2.52)	(-)24.4	(-)54.7	(-)40.1
Total Operated area (acres)	21726 (100)	22678 (100)	199957 (100)	(+)4.4	(-)8.1	(-)12.0
Small farm	3530 (16.20)	6573 (28.98)	8219 (41.81)	(+)86.2	(+)132.8	(+)25.0
Medium farm	9928 (45.70)	10226 (45.10)	8282 (41.50)	(+)3.0	(-)16.6	(-)19.0
Large farm	8268 (38.10)	5879 (25.92)	3456 (17.32)	(-)28.9	(-)58.2	(-)41.2
Operated farm area (acres)	3.54	2.26	1.69	(-)36.2	(-)52.3	(-)25.2
Small farm	1.11	0.93	0.87	(-)16.2	(-)21.6	(-)6.5
Medium farm	4.29	4.12	3.99	(-)4.0	(-)22.4	(-)3.2
Large farm	12.60	11.85	11.64	(-)6.0	(-) 7.6	(-)1.8
Gini index*	0.490	0.548	0.540	(+)11.84	(+)10.2	(-)1.46

Source: Report of the Census of Agriculture (National Vol.1), 1983-84 and 1996.
Note: Figure in the parenthesis is the % of total.

The large farm households which operate more than 7.5 acres of land constituted nearly 3 percent of the total farm holdings but operated slightly more than 17 percent of the total farm area. A clear picture that emerges from the same table is the small domination of the farm

* The Gini coefficient is the ratio of the differences between the line of absolute equality (diagonal) and the Lorenz Curve to the triangular region underneath the diagonal.

holdings having registered a clear gain in numbers as well as operated area. Medium and large farmers, on the other hand, have indicated a distinct decline both in numbers and area under operation. The average farm size in all size groups has declined reflecting the increase in population pressure and the small farm size decreased from 1.11 acres in 1960 to 0.93 acres in 1983-84 and then to 0.87 acres in 1996. A similar declining trend is also noticed in case of the other size classes. It is, therefore, apparent that significant changes occurred in the size classes and the pressure of population on land is very high which tends to diminish the per capita landholding and consequently leads to an increase in the number of small and marginal farms. Small landholding per capita coupled with concentration of land in a few lands characterizes the land distribution in rural Bangladesh and therefore, greatly hinders in bringing out optimum benefits of available land.

The Gini index indicated a sharp increase in inequality in the distribution of operational land between 1960 and 1983-84, while between 1983-84 and 1996 it showed a slight decrease from 0.5483 to 0.5396. This improvement in the distribution of operational holdings may be explained by (a) increased growth of population and agricultural households dependent upon lands for subsistence, (b) effects of the inexorable operation of Muslim law of inheritance which leads to sub-division, and (c) absentee ownership and squeezing of big farms by letting out part of own land to small tenants on share-cropping basis.

V. EMPIRICAL ANALYSIS AND MAJOR FINDINGS

Many studies have been conducted based on the landholding distribution. Rogoff (1953), Glass and Hall (Glass, 1954), Prais (1955), Matras (1967), Bounden (1973), Kemeny and Snell (1976), Rahman (1994), Huda and Rahman (1997) and many others studied landholding distribution with Markov chain model and made significant contribution. But only a few of those have considered higher order generations (like grandfather) of the respondent.
In this study, information on three generations is collected through direct interview. Our main concern is to examine changes in the distribution in landholding over the last three generations.

The ownership mobility are analyzed with the help of the methods of stochastic process in order to construct a model to represent the transition which takes place in size classes of father and sons. An attempt has also been made to estimate the limiting behavior of transition probabilities of land ownership size classes between the three generations. Test of hypothesis is then performed to examine whether the observed process is a realization of Markov chain of order one and finally we used a tool to examine the stationarity of the pooled transition matrix constructed from the cross tabulations of the three generations which provide knowledge about the equilibrium distribution of the landholding size.

A simple cross tabulation of sample households according to landholding size of father and his son shown in Table 2 highlights the process and the direction of landholding mobility of households in the form of matrix notation.

Table 2: Mobility Matrix According to Landholding Size Class

Father's Size Class	Son's Size Class				Marginal Total
	LL	SF	MF	LF	
LL	1	2	0	0	3
SF	1	146	6	1	154
MF	0	29	4	0	33
LF	0	7	2	1	10
Total	2	184	12	2	200

From a comparison of marginal totals of row and column, it appears that there is a distinct pattern of social polarization though a few landless households experienced upward mobility. About 24 percent of all the households moved from their inherited size class to new classes of which 4.5 percent (households above the diagonal) experienced upward mobility and 19.5 percent (households beneath the diagonal) suffered downward mobility. 1 out of 2 households that are currently landless lost his land since his inheritance. The only transition towards landlessness was observed from small farm size class.

On the contrary, of the 2 landless households that acquired land since inheritance moved to adjacent small farm size class. Among the small farm size class only 7 households showed upward mobility, of which 6 to medium and 1 to large farm size class, while none of 33 medium farm households advanced to its next higher group (LF). This wide variation in degree of mobility between the two periods may be partly because of deterioration of socio-economic condition of peasants' society and partly because of the variation in sample sizes.

The transition between size classes of the successive generations in a household may be regarded as transition of a Markov chain with the above transition probabilities. The transition probability matrix obtained from Table 2 may be denoted by $P = [P_{ij}]$.

$$P = \begin{bmatrix} 0.333 & 0.667 & 0.000 & 0.000 \\ 0.007 & 0.948 & 0.038 & 0.007 \\ 0.000 & 0.879 & 0.121 & 0.000 \\ 0.000 & 0.700 & 0.200 & 0.100 \end{bmatrix}$$

The diagonal elements of P indicate the probability that a household will remain in same state from one generation to the next. For instance, given that father is landless, after one generation the probability that his son will be landless is 0.333.

From matrix multiplication we get

$$P^2 = P.P = \begin{bmatrix} 0.115 & 0.855 & 0.025 & 0.005 \\ 0.009 & 0.942 & .0042 & 0.007 \\ 0.006 & 0.940 & 0.048 & 0.006 \\ 0.005 & 0.909 & 0.071 & 0.015 \end{bmatrix}$$

From above matrix we can interpret, given that father is landless, after two generations the probability that his grandson will be landless too is 0.115.

The off diagonal elements show transitions from one state to another. For instance, given that the father is of small farm, after one generation the probability that his son will be of medium farm is 0.038 and after two generations the probability that his grandson will be of medium farm is 0.0042.

Similar interpretation may be given from limiting behavior of transition matrix P (Table 2) for small, medium, and large farm size classes. It is interesting to note that the probability of remaining in the same farm category decreases with an increase in landholding size. The large farmers are less likely to have the same size category after one generation. Below we represent two tables to have an idea about the limiting behavior of the three generations with father and son in one and grandfather and father in another.

Table 3 reveals that limiting value $\lim_{n\to\infty} P^n$ is equivalent to P^7, (n>7) which implies that the Markov chain will occupy any state which is independent of the initial state and the social (size classes) structure will be stable after 7 generations; i.e.,

$$\lim_{n\to\infty} P^n \rightarrow (0.010 \quad 0.941 \quad 0.042 \quad 0.007)$$

In other words, if a household starts initially with any state of size class then after 7 transitions the probability of getting that household in landless, small, medium, or large size class is 0.010, 0.940, 0.042, and 0.007 respectively. For n=8 or more, no further change in transition probability will be observed.

Another table reveals that limiting value $\lim_{n\to\infty} P^n$ is equivalent to P^8, (n>8) which implies that the Markov chain will occupy any state which is independent of the initial state and the social (size classes) structure will be stable after 8 generations; i.e.,

$$\lim_{n\to\infty} P^n \rightarrow (0.002 \quad 0.913 \quad 0.085 \quad 0.000)$$

In other words, if a household starts initially with any state of size class then after 8 transitions the probability of getting that household in landless, small, medium, or large size class is 0.002, 0.913, 0.085, and 0.000 respectively. For n=9 or more, no further change in transition probability will be observed.

Table 3: Limiting Behavior of Transition Probability Matrix P (Father vs Son)

n	P^n
1	$\begin{bmatrix} 0.333 & 0.667 & 0.000 & 0.000 \\ 0.007 & 0.948 & 0.038 & 0.007 \\ 0.000 & 0.879 & 0.121 & 0.000 \\ 0.000 & 0.700 & 0.200 & 0.100 \end{bmatrix}$
2	$\begin{bmatrix} 0.115 & 0.855 & 0.025 & 0.005 \\ 0.009 & 0.942 & .0042 & 0.007 \\ 0.006 & 0.940 & 0.048 & 0.006 \\ 0.005 & 0.909 & 0.071 & 0.015 \end{bmatrix}$
5	$\begin{bmatrix} 0.014 & 0.937 & 0.042 & 0.007 \\ 0.010 & 0.941 & 0.042 & 0.007 \\ 0.010 & 0.941 & 0.042 & 0.007 \\ 0.009 & 0.941 & 0.043 & 0.007 \end{bmatrix}$
7	$\begin{bmatrix} 0.010 & 0.941 & 0.042 & 0.007 \\ 0.010 & 0.941 & 0.042 & 0.007 \\ 0.010 & 0.941 & 0.042 & 0.007 \\ 0.010 & 0.941 & 0.042 & 0.007 \end{bmatrix}$

It may also be noted from both the tables that though the landholding structure appears to be stable after 7 or 8 generations, nevertheless, the process of stability starts after 2 generations.

First of all we can test the order of the Markov chain so that we can undergo further analysis with the assumption of first order Markov chain model. And the second test is concerned with the stationarity of the distribution whether it is achieved at the third generation or not.

For testing the null hypothesis that the chain is of order zero, i.e.,

$$H_0: P_{ij}^0 = P_j \ ; \text{ For all } i,j = 1,2,\ldots..m$$

against the alternative that the chain is of order one, the test statistic developed by Anderson and Goodman (1957) under null hypothesis is given by

$$-2\log\Lambda = 2\sum_{i=1}^{m}\sum_{j=1}^{m} n_{ij}\log\frac{(N)n_{ij}}{(n_{i.})(n_{.j})}$$

$$= 16.149$$

which has an asymptotic χ^2 distribution with $(4-1)^2 = 9$ degrees of freedom. That is P $\{\chi^2 \geq 16.149\}$ is small with 7 % level of significance and the reason of it's insignificance within 5 % level of significance may be due to our sample size. If we were able to take more sample households then it would be possible to show it. Therefore, we can announce the transition probability matrix as of order one.

Now we can test the stationary of the transition probability matrix. We can test the hypothesis that the landholding distribution of the three generations is stationary with only three generations. The likelihood ratio test statistic (-2 ln Λ) under the null hypothesis, has a χ^2 distribution with $(T-1)[m(m-1)] = (2-1)[4(4-1)] = 12$ degrees of freedom. In this case

$$-2\ln\Lambda = 2\,[\,L(\hat{P}^t) - L(P)\,]$$

$$= 2\sum_{t=1}^{T}\sum_{i=1}^{m}\sum_{j=1}^{m} n_{ij}^{t}\ln\frac{n_{ij}^{t}}{n_{i}^{t-1}p_{ij}}$$

$$= 225.243$$

From χ^2 table we find $P\{\chi^2 \geq 225.243\} < 0.001$

This shows that we can reject the null hypothesis of stationarity even at 0.1 % level of significance and conclude that the landholding distribution is not a stationary distribution with three generations. It needs further generations to make the landholding distribution stationary, which supports our interpretation on this distribution from the limiting behavior of the transition probability matrices. It can very well be noticed that earlier we found from the limiting behavior of the transition probability matrices constructed from the landholding distribution of the grandfather and father, and from the landholding distribution of the father and son that the distribution will be stationary at the succeeding 8^{th} and 7^{th} generations respectively. As we have dealt with only three generations and the data of further seven generations are not available, our test result goes in favor of non-stationarity of the distribution.

VI. CAUSES OF MOBILITY IN LANDHOLDING DISTRIBUTION

In presence of the current complex structure of the rural society, it is difficult to single out the actual cause for land transactions and thereby mobility of landholding over the period. There is no regular pattern and linear trend in transition and it depends upon many complex effects and combined factors. However, an attempt has been made in this section to identify the main causes of mobility in landholdings.

The causes of upward mobility between two successive generations (Father and Son) have been identified and summarized in Table 4. Total 69 out of 200 households showed upward mobility. It appears that purchase of land by savings from salary, business, agriculture, etc. as a cause of upward mobility accounted for 93 percent, which is followed by gift from relatives (7 percent). The two landless households that showed upward mobility moved to higher group by purchasing land from savings.

Table 4: Distribution of Households by Causes of Upward Mobility in Land Ownership Holding

Causes	Fathers	ownership		Total
	LL	SF	MF	
Purchase by savings	2 (100)	54 (93.1)	8 (100)	64 (92.75)
Gift from relatives	-	4 (6.9)	-	5 (7.25)
Total	2 (100)	5 8 (100)	8 (100)	69 (100)

Figures in the parentheses are percentages of total.

Similarly, the causes of upward mobility between grandfather and father have also been identified. Total 44 out of 199 (1 was missing) households showed upward mobility and among them 68 percent was due to purchase of land by savings from salary, business, agriculture, etc., 25 percent was due to gift from relatives and rest 7 percent was due to other causes like possession of strip of sandy land arising out riverside bed, got land from mother's property as she died, and so on. On the contrary, from the fathers land distribution 123 (61.5 %) households showed downward mobility of which 40 percent is from the small farm, 12 percent from the medium farm, and 3.5 percent from the large farm groups. Table 5 reveals the effect of rapid increase in population and that the Muslim law of inheritance is the major cause (48 %) of downward mobility. About 41 percent of the total households suffered downward mobility due to distress sale of land. Among the major causes river erosion caused 9 percent of the downward mobility and other causes like the following had a little percentage:

Father died earlier than grandfather and was deprived of the inherited land, Father sacrificed some land for his brother or sister, Government seized some land for development purpose, and so on.

Table 5: Distribution of Households by Causes of Downward Mobility in Land Ownership Holding.

Causes	Fathers ownership categories			Total
	SF	MF	LF	
Fragmentation due to Muslim law of inheritance	49 (53.26)	9 (37.5)	1 (14.29)	59 (47.97)
Distress sales	32 (34.78)	13 (54.17)	6 (85.71)	51 (41.46)
River erosion	9 (9.78)	2 (8.33)	- -	11 (8.94)
Others	2 (2.18)	-	-	2 (1.63)
Total	92 (100)	24 (100)	7 (100)	123 (100)

Figure in the parentheses are percentages of total

Of the grandfathers land distribution 140 households showed downward mobility of which 58.57 percent caused by Islamic law of inheritance, 29.29 percent due to distress sales, 6.43 percent due to river erosion, and 5.71 percent due to other reasons as described above.

Though some major causes of land transactions have been identified, nevertheless, the data on land ownership holdings at two points of time only provided limited insight into the dynamics of changes over the periods.

VII. CONCLUSION

The main concern of this paper was to examine the changes in the distribution in landholding over the last three generations. Dynamic aspects of ownership mobility were analyzed with the help of methods of stochastic process in order to construct a model to represent the transition, which takes place in size classes of father and his sons. We approximated the Markov chain model of order one to be appropriate for our study and then test of hypothesis was performed to examine whether the observed process is a realization of Markov chain of order one. By the estimated limiting behavior of the transition probabilities of landownership size classes between the generations we interpreted that at the coming seventh generation the landholding distribution will be stationary i.e., no changes will take place afterward. This phenomenon was also examined with the help of the test for the stationarity, where we rejected our null hypothesis of stationary landholding distribution with only three generations.

The foregoing analysis revealed that a distinct two directional mobility in landownership exists between the two successive generations. There are, however, some variations in the degree of mobility among different classes. Though a few landless and small farmers showed upward mobility, many of the households who have some land now will, no doubt, become landless in the course of one or two generations. The limiting distribution of transition

probabilities of landholding envisaged that after seven generations, about 95 percent of the total sample households will be in the lower categories (LL and SF), 4 percent in the medium, and 1 percent in the upper size classes, whereas the corresponding figures at the time of inheritance were 78, 17, and 5 percent respectively. Economic, social and demographic factors are the main causes of mobility. Distress sale, river erosion, fragmentation of land (land division) due to Muslim law of inheritance, among others were identified as the determinants of downward mobility, while the purchase of land, and gift from relatives were identified as the main causes of upward mobility.

From the point of view of economic efficiency only it makes sense, as the small farms in Bangladesh are found to be more intensely and more efficiently cultivated. Landholding will continue to break into pieces in the natural course of subdivision among the heirs. As a consequence, by the turn of the century, perhaps, many of the large farms will be split into medium and small farms and many landless people will disappear from the scene. But simultaneously almost all the farms will end up being too small to be of proper economic use. As there should be a limit to large farms, there has to be also a limit to the small farm as well if efficiency considerations are to be satisfied. More than 77 percent of small farm households, that is, those below 2.49 acres in size are already threatened with total disintegration. If things are allowed to continue as they are, more than 95 percent of farm households may face the same fate in further few decades. It is visualized by the estimated limiting behavior of transition probabilities of landownership size classes between the two generations.

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