

AGRICULTURAL DEVELOPMENT AND RURAL LANDLESSNESS IN INDIA

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Recent optimism over increased production from improved farming technologies has been tempered by more guarded assessments of social structural consequences (Wharton, 1969; Frankel, 1971; Griffin, 1974). The transformation of traditional farming arrangements into "kulak" agriculture has raised the specter of capitalist farmers buying land, displacing tenants, and becoming wealthy at the expense of the poor. The subsequent increase in the number of landless laborers has been recognized as a possible source of rural unrest. Moore (1969) and Paige (1975) link landlessness and revolutions in major cross-national studies. Zagoria (1971) and Jannuzi (1974) have made this link in studies of India.

THE COMMERCIALIZATION OF AGRICULTURE

One common assertion is that agricultural development is often associated with proletarianization of the labor force: small peasants become wage laborers while many large landowners manage to become capitalist farmers. The thesis survives because it fits with some of the well-documented historical cases of agricultural change. Perhaps the most notorious is the English enclosure movement which is held responsible for transforming peasants into rural and urban laborers. Increased rural landlessness was one result of Japan's growth in rice production and the concomitant commercialization of agriculture (Dore, 1959). In the Japanese case, displaced cultivators remained as tenant farmers. These historical lessons of the simultaneous growth of agricultural production and landlessness are now being applied to recent development in foodgrain production in the third world (see, e.g., Griffin, 1974).

The rural proletarianization thesis also is consistent with the hypothesis about the inequalitarian effects of early stages of development (see, e.g., Adelman and Morris, 1973). It fits with the findings of Richard Robinson (1976) that economic development has a negative impact on

the share of income going to the poorest one-fifth of households. While the landlessness ratio is only one aspect of rural inequality, it is widely regarded as the most basic (Stinchcombe, 1961; Paige, 1975; and, for India, Thorner and Thorner, 1962; Beteille, 1972). And because agriculture is such an extensive part of most third world economies, the relationship between agricultural development and landlessness is a basic component of the effect of economic growth on inequality (Kuznets, 1955; Jackman, 1974).

The early economic growth/inequality and capitalist agriculture/rural proletarianization relationships are fairly well established in the development literature. But we feel they do not necessarily support a connection between recent agricultural production gains and the increase of rural landlessness. The capitalism/proletarianization thesis should not be applied too uncritically to recent agricultural development in the third world. Perhaps it is not increased production *per se* which causes landlessness, but rather the historical complex of political, demographic, land reform, and other factors which break down the old structure of production relations. Increased agricultural development may or may not be the impetus for changes in class relationships and increases in the ranks of the landless labor class.

Nevertheless, most research on India has also concluded that increased agricultural production and increases in landlessness are causally linked (Frankel, 1971; Aggarwal, 1971; Bandyapadhyaya, 1977; Dasgupta, 1977). Kathleen Gough (1978), after witnessing both increased production and higher rates of landlessness in Thanjavur District in South India, concludes that the former must be causing the latter. Ranjit Sau (1971) has calculated from a cross-sectional analysis of poverty in Indian states that both rural poverty and the proportion of landless are *positively* related to agricultural output per acre.¹

Two observations have supported the case for the inegalitarian impact of contemporary agricultural change: (1) The benefits of the new seed technologies often appear to be reaped most by the large farmers; and (2) coincident with the increased food production has been a rising proportion of landless laborers. Plausible explanations have been constructed to explain why the new technologies are having such a polarizing effect. To be effective the new hybrid seeds require major increases in fertilizers, irrigation, and labor. Only the larger farmers have the access to credit to afford these necessary investments; meanwhile the smaller farmers are pushed off their marginal farms and into the wage labor market. Both the sudden wealth of the larger capitalist

farmers and the recent growth of landless labor seem to fit the common pattern of a causal link between capitalist development and the proletarianization of the labor force.

These conclusions are based on studies that have two major drawbacks. Most of the research on India has been geographically limited to high production areas such as the Punjab or to "rice bowls" such as Thanjavur. The rationale for studying these productive areas is that such vanguards of third world agriculture represent patterns of social change that will eventually spread throughout the country. But to limit analysis to productive regions prevents comparisons with the more backward regions. Thus, while the Punjab may be experiencing increased landlessness, other, less productive, regions may be experiencing increases in landlessness at an even faster pace. Only if the ratio of landless to landed is growing faster in the Punjab than in the less productive regions, can we conclude that increased agricultural production contributes to increased landlessness. The present study has the advantage of comparing virtually all of India's districts.

Another drawback of earlier studies is that they often depend on social structural data for only one date or they investigate changes only over a very short span. The lack of longitudinal data circumscribes the ability to discern the direction of causality and raises questions about whether observed changes are permanent or temporary. The supply of landless laborers may respond very quickly to the demands of increased production and may sometimes even play a causal role in promoting higher yields. By contrast, the processes that determine the numbers of landed farmers (e.g., generational changes and the division of family farms) are likely to be much slower. The generational division of family farms would not only produce an increase in the number of landed but would also eventually depress the need for hired labor. Thus, detection of any permanent changes in the structure of the labor force requires a study of sufficient duration to discern these slower processes.

In a study which demonstrates the usefulness of longitudinal analysis, Atwood (1979) reports that landowning patterns became more equitable between the 1920s and the 1970s for the indigenous population because "some of the rich became poorer; while some of the poor became richer." *Immigrant* landless laborers are the primary component of growing inequality in the Maharashtra village studied by Atwood, not disenfranchised farmers.

INDIAN DISTRICT PANEL ANALYSIS

Our research design is a panel study of data from 313 of India's 334 districts² between 1961 and 1971. The sample represent virtually all of the non-metropolitan districts of the country for a period of substantial technological and social change. Indian districts are administrative units just below the state level; they contain an average of about 1.5 million people and are roughly 100,000 square kilometers in size. Districts are key units in adapting national planning goals to local conditions and for coordinating intra-district development activities (Taylor et al., 1965). The practical effect of using district-level data is twofold: (1) some insight into regional variation within the national aggregate is possible and (2) district-level data are more nearly comparable than is the case for national-level data. Operational definitions of the measures and the data sources used are described in the following sections.

Definitions and Data Sources

The Union Primary Census Abstract (Government of India, 1964:1974) reports the number of landed cultivators and agricultural workers in each district for 1961 and 1971. The census definitions do not distinguish between cultivators who own their land and tenants who lease it from others. Thus, the category of agricultural laborers includes only those whose primary occupation is hired labor on farms cultivated by others—a conservative definition of “rural proletariat.”

The census definition of labor force categories changed substantially between 1961 and 1971.³ We have no way of knowing how the definitional change might affect differences between districts. We can be sure, however, that the definitional changes affected statistics for men less than for women and, within agricultural work, probably less for rural than for urban residents. A resurvey of the Census (Bardhan, 1977) suggests that the number of male cultivators and laborers was affected by only one or two percent. Therefore, in addition to results for the total laborer-to-landed ratio, we will also present a separate analysis for rural males only, for whom the definitional changes present less of a problem.

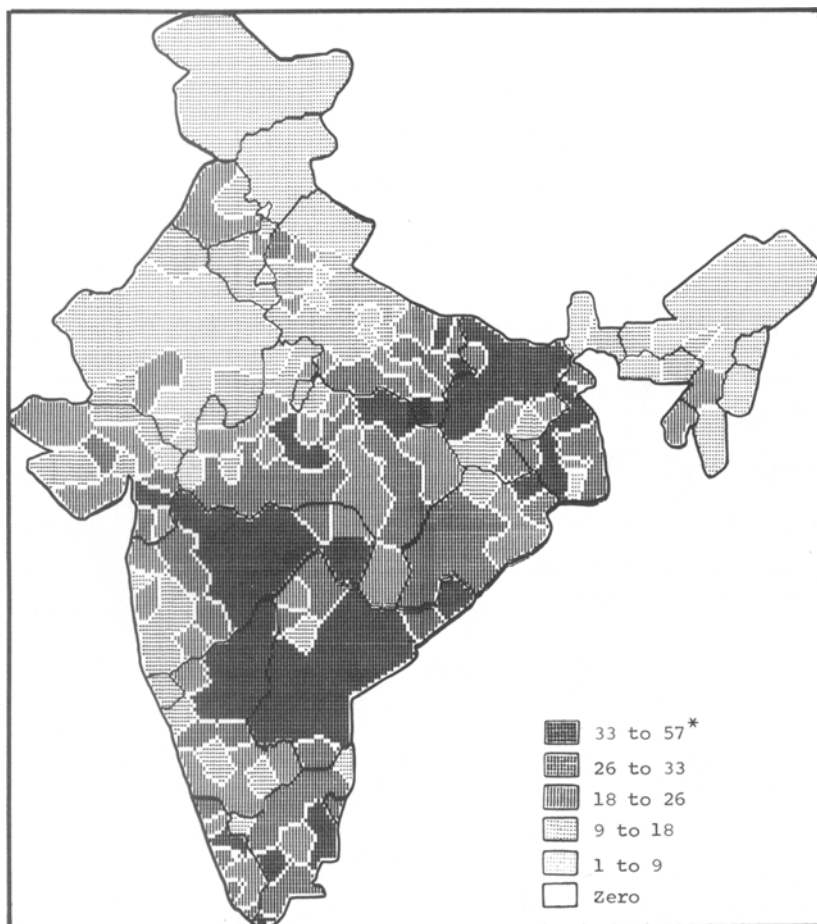
An index of agricultural production was constructed by multiplying each district's production of each of 12 major crops by an all-India price (Government of India, 1970; 1971). The 12 major crops repre-

sent the major grains and cash crops grown to some degree in all parts of the nation. Districts and regions which specialize in particular crops can be compared by converting crop production figures to a common monetary base, using the 1961 all-India prices appropriate to each crop. The same, 1961, prices were used for indexing both 1961 and 1971 production volume; thus changes in market prices do not enter into the analysis.

The following analysis centers on whether high or increasing agricultural productivity caused an increase in landlessness during the 1960s. We first describe the Indian cross-regional patterns, which demonstrate substantial regional differences in both the rate of landlessness and agricultural production. Next, we use a panel regression analysis to examine the relationship between the 1961 level of agricultural production and change in landlessness between 1961 and 1971. This impact of prior levels of agricultural production on change in the rates of landlessness is called the *lagged decade* effect. The final section relates the 1971 levels of agricultural production to the change in landlessness rates over the same period, which we call the *short run* effect.

Cross-Regional Variations in Landlessness and Agricultural Productivity

Landlessness apparently increased sharply during the decade of the 1960s. Some of this can be attributed to definitional change, but other social and economic factors most assuredly contributed to the growth. By 1960, the sweeping *zamindari* land reforms which drastically reduced absentee landlordism in the rural areas, had about run its course. Subsequent attempts to redistribute land further were met with stiff political resistance, and cultivators devised all kinds of methods to avoid relinquishing any of their land. In the 1961-71 decade, the average percentage of farm workers classified as landless laborers rose from 21 to 33 (Rows 3 and 4, Table 1). It should be remembered that the Indian census definition of an agricultural laborer is conservative in excluding tenants. However, the immense cross-regional variation in landlessness is demonstrated in both Table 1 and Map 1. The predominantly rice growing regions of Kerala (62 percent landless), Andhra Pradesh (53 percent), and Bihar (45 percent) and the dry farming areas of Maharashtra (45 percent) have the highest rates. By contrast sparsely populated regions such as Jammu and Kashmir (4 percent landless),

Map 1. Percentage of Agricultural Laborers, Total Workers in India, 1971

*Each value category contains approximately twenty percent of the districts in India.

Himachal Pradesh (5 percent), and Assam (13 percent), have far lower rates. Such large cross regional differences dwarf the all-India 12 percent increase in landlessness for 1961-1971.

Productivity per farmworker also varies enormously across regions in India. In Table 1 the states have been ordered according to the mean value of crop productivity per farmworker in 1961; this varies almost fourfold from 210 rupees per farmworker in densely populated Bihar to 826 rupees per farmworker in the wheat-growing state of Punjab.

Table 1. State Means for 1961 and 1971 Crop Production per Farmworker and Percent Laborers of Rural Farmworkers.

State*	Crop production per farmworker (in Rupees)		Percent laborers of rural farmworkers	
	1961	1971	1961	1971
Punjab (11 districts)	826 (1)#	1412 (1)#	15.3 (11)#	30.7 (11)#
Haryana (7)	630 (2)	1205 (2)	10.1 (13)	23.9 (13)
West Bengal (15)	429 (3)	471 (6)	26.4 (6)	42.5 (6)
Uttar Pradesh (48)	412 (4)	490 (5)	14.7 (12)	25.7 (12)
Gujarat (18)	362 (5)	664 (3)	21.2 (9)	33.5 (9)
Tamil Nadu (12)	333 (6)	414 (9)	31.1 (4)	51.6 (3)
Orissa (13)	321 (7)	386 (10)	22.2 (8)	35.5 (8)
Maharashtra (25)	321 (8)	262 (15)	34.9 (3)	45.2 (5)
Madhya Pradesh (43)	313 (9)	367 (11)	21.0 (10)	33.2 (10)
Karnataka (19)	290 (10)	463 (7)	22.9 (7)	39.1 (7)
Assam (9)	253 (11)	356 (12)	4.8 (15)	12.9 (15)
Andhra Pradesh (21)	252 (12)	302 (14)	41.3 (2)	53.4 (2)
Kerala (10)	245 (13)	202 (17)	45.7 (1)	62.9 (1)
Rajasthan (26)	219 (14)	535 (4)	5.7 (14)	13.1 (14)
Bihar (17)	210 (15)	232 (16)	29.2 (5)	45.3 (4)
Himachal Pradesh (8)	208 (16)	305 (13)	2.4 (16)	5.3 (16)
Jammu and Kashmir (9)	196 (17)	455 (8)	1.4 (17)	4.1 (17)
India mean (313)	333	460	21.2	33.3
India s.d. (313)	188	303	14.6	17.4

* Only states with five or more districts are included in the table.

Numbers in parentheses are ranks among the seventeen states listed.

However, even these state averages show no clear relationship between productivity and growth in landlessness. During the 1960's, landlessness increased 16 percent in prosperous Punjab (from 15 to 31) and an equal amount, 16 percent, in impoverished Bihar (from 29 to 45). We

will examine this relationship with more precision in the regression analysis of the lagged decade effects of agricultural production.

Agricultural production also increased substantially between 1961 and 1971. The most dramatic improvement in crop productivity occurred in the irrigated, wheat-growing Punjab. There, the yield per farmworker increased from Rs. 828 per farmworker in 1961 to Rs. 1412 per farmworker in 1971. Because of unfavorable monsoons and the lack of improvement in millets before 1970, Maharashtra actually experienced a decline in average production per farmworker (from Rs. 321 to Rs. 262). Kerala, with an even lower productivity rate also experienced a decrease (from Rs. 245 to 202). Again, this range of productivity changes is not closely related to the changes in landlessness. In declining Kerala the percent of landlessness grew faster than in the prospering Punjab (46 to 63 percent versus 25 to 31 percent); but unlike Kerala, a decline in Maharashtrian productivity was associated with a low rate of growth in landlessness (from 36 to 45 percent). In the second regression analysis we will examine more closely the relationship between changes in productivity and changes in the landlessness ratio.

The Lagged Decade Effect of Agricultural Production

The impact of agricultural production on change in landlessness can be analyzed through a panel study regressing 1971 levels of landlessness on 1961 levels of crop production, while controlling for 1961 levels of landlessness. Obviously there will be high stability in the number of landed or landless in a district during the decade. What we are interested in is whether agricultural production is positively related to the 1971 figures, even after controlling for the 1961 starting point. A positive coefficient for agricultural production is evidence that in the more productive areas the number of agricultural workers grew faster than would be expected.

We are interested primarily in the change in the ratio of landless laborers to landed farmers. The analysis of ratio variables has some well-recognized statistical difficulties (Schuessler, 1974). We analyze change in the numerator (landless laborers) and denominator (cultivators) separately. Changes in the ratio of the two variables can be calculated quite simply from the two separate analyses of the logarithms of the numerators and denominators. The separate analyses provide more information about increased landlessness by estimating

the effects of agricultural production on both the number of landed and the number of landless. It should be noted that neither the problem nor this solution are merely statistical concerns. Any satisfactory analysis must recognize that the degree of landlessness is a resolution of the forces acting on both the number of landed *and* the number of landless. Two simultaneous trends may be occurring: while greater agricultural production may increase the number of landless laborers, it may also increase the number of landed farmers.

The statistical model we have used assumes proportional changes in the work force in response to proportional increases in production. That is, we will estimate the coefficients for a multiplicative model (production function) by taking the logarithms of all terms in the equation. Since the 1971 ratio of laborers to landed cultivators is exactly determined by the number of laborers and the number of cultivators, we can calculate the estimated effect of production on changes in the ratio by subtracting the production coefficient in the cultivators equation from the production coefficient in the laborers equation.

Thus if we estimate the following two equations:

$$(1) L_{1971} = b_1 L_{1961} + b_2 C_{1961} + b_3 V_{1961} + b_4$$

$$(2) C_{1971} = b_5 L_{1961} + b_6 C_{1961} + b_7 V_{1961} + b_8,$$

where:

C = the logarithm of the number of landed cultivators

L = the logarithm of the number of hired laborers

V = the logarithm of the value of agriculture production.

If

$$(L/C)_{1971} = \text{the logarithm of the ratio of laborers to cultivators in 1971 (since } (L/C)_{1971} = L_{1971} - C_{1971}),$$

then we can subtract Equation 2 from Equation 1 to estimate the effects on the landless to cultivator ratio:

$$(L/C)_{1971} = (b_1 - b_5) L_{1961} + (b_2 - b_6) C_{1961} + (b_3 - b_7) V_{1961} + (b_4 - b_8)$$

In this equation, the $(b_3 - b_7)$ difference represents the effect of agricultural production on the landlessness ratio.

The impact of agricultural production on the ratio of landless laborers to cultivators is demonstrated by the two sets of equations reported

Table 2. The Lagged Decade Effect of 1961 Crop Production on the Change in Cultivators and Agricultural Laborers Between 1961 and 1971

	Totals		Rural Males	
	Cultivators	Laborers	Cultivators	Laborers
	in 1971	in 1971	in 1971	in 1971
Cultivators in 1961	.845** (.008)	.020 (.032)	.943** (.015)	.176** (.036)
Laborers in 1961	-.036** (.008)	.763** (.014)	-.026** (.007)	.789** (.017)
Crop production in 1961	.133** (.017)	.113** (.029)	.052** (.015)	.009 (.066)
Total R ²	.943	.956	.972	.951
Variance explained by crop production	.010	.002	.001	.000
% of residual variance explained by crop production	.153	.044	.036	.000

** p < .01

Standard errors are in parentheses.

in Table 2. The first two columns of coefficients in this table represent equations for analyzing the impact of agricultural production on total (urban and rural, male and female) laborers and cultivators; the second two columns represent equations for rural males only. The table suggests that the numbers of *both* landless laborers and cultivators are positively related to earlier productivity (although the effect is negligible and nonsignificant for rural male laborers). For laborers the coefficients of production are 0.113 for the entire district but just .009 for rural males. This means that controlling for the prior proportions of laborers and cultivators, 1.0 percent greater productivity in 1961 causes a 0.113 percent increase in laborers in 1971. These positive coefficients are consistent with the conventional wisdom that laborers are increasing faster in productive regions.

The more remarkable result in Table 2 is the even larger rate of increase of landed cultivators in response to 1961 production. The coefficient for total cultivators is 0.133 and for rural male cultivators, 0.052. Both of these are larger than the respective coefficients for

Table 3. Predicted Population of Laborers and Cultivators in an Average District with High or Low Crop Production

	1961 Starting Point Actual India Means	1971 Predicted Population	
		Low Production District (80 million rupees)	High Production District (200 million rupees)
Rural Male Laborers	53,518	98,100	98,941
(Percent Change 1961-1971)		(83.30)	(84.87)
Rural Male Cultivators	204,975	206,571	216,748
(Percent Change, 1961-1971)		(0.78)	(5.74)
% Laborers	20.7%	32.2%	31.3%

landless laborers. Thus, these findings suggest that the ratio of landless to landed does not increase quite as fast in the productive areas as in poorer areas. The differences (-0.020 for the total district; -0.043 for rural males) are equivalent to the coefficients for the effects of agricultural production on the ratio of laborers to cultivators. The coefficients are small and generally do not exceed the standard errors of each of the terms. Nevertheless, *there is no evidence that, over a ten year period, the ratio of laborers to cultivators increased in response to agricultural production*. While the landlessness ratio increased in all the districts, the increase is not systematically greater in the more productive districts. If anything, landlessness increased somewhat more slowly in the productive regions. These results provide no support for the common belief that a direct relationship exists between productivity and landlessness.

More concrete results from this analysis are presented in Table 3. The table compares two hypothetical districts⁵ with the same number of landless laborers and cultivators in 1961 but with different levels of agricultural production. The coefficients from the rural male equation are used to calculate the predicted number of cultivators and laborers in 1971. The number of laborers increases dramatically in both districts, but only slightly more in the high production district (an 84.9 percent increase) than in the low production district (83.5 percent). Compared to the overall increase in all districts, the differences due to agricultural production are negligible.

The increase in the number of cultivators is more modest (held down in part by the change in census definitions). Production levels do affect the size of this small increase. The "typical" low production district had a negligible (0.8 percent) increase in landed cultivators while the high production district showed several times the rate of increase (5.7 percent).

Thus, while the number of landed cultivators had a rather flat growth rate during the 1960s, there was a greater than average increase resulting from high 1961 levels of agricultural production. Landless laborers show the opposite pattern: the number of laborers increased dramatically, but there was equal growth in all districts regardless of the 1961 levels of agricultural production. As a result of these two trends, the *percent* landless increased substantially in India but somewhat *less* so in the high production districts. The slightly smaller increase in landlessness is due to the greater growth of landed cultivators in the high production districts. Thus, the effect of agricultural production on

landlessness has little to do with the landless laborers—the decisive factor is the changes in the number of landed.

The Short Run Effects of Agricultural Production

The previous analysis describes only the effect of agricultural production on the number of laborers and cultivators still observable after the ten year lag. We can assume that some of the effects of production are more immediate than this and that some estimate of these immediate effects might be provided by including a term in the equation for current (1970-1971) production. (This model has the shortcoming of ignoring the simultaneous effects of the 1971 supply of cultivators and laborers on 1971 production—therefore we must be more cautious in our interpretations.) A second set of analyses is performed which adds the 1971 production data to the model, as demonstrated in the following two equations:

$$(3) L_{1971} = b_1 L_{1961} + b_2 C_{1961} + b_3 V_{1961} + b_4 V_{1971} + b_5$$

$$(4) C_{1971} = b_6 L_{1961} + b_7 C_{1961} + b_8 V_{1961} + b_9 V_{1971} + b_{10},$$

where

C = the logarithm of the number of landed cultivators

L = the logarithm of the number of hired laborers

V = the logarithm of the value of agriculture production.

Because 1961 levels of agricultural production have been held constant, the short run effects coefficients for V_{1971} represented by b_4 and b_9 measure the impact of agricultural *change* on increases in agricultural laborers and cultivators. As in Equations 1 and 2, the short run effect of agricultural production on the change in the *ratio* of laborers to cultivators can be calculated by subtracting the coefficients for $V_{1971}(b_9 - b_4)$.

A somewhat different picture emerges from the analysis of the short run effects of agricultural production. The results are presented in Table 4. Here the relative effects on cultivators and laborers are reversed from the earlier table. The coefficients of current production for laborers are 0.132 for the total district and 0.169 for rural males. Both are more than twice their standard errors. More important, both are larger than their respective cultivator coefficients (0.087 and 0.044), although the cultivator coefficients are also more than twice their standard errors.

Table 4. The Short Run Effect of 1971 Crop Production on the Change in Cultivators and Agricultural Laborers Between 1961 and 1971

	Totals		Rural Males	
	Cultivators	Laborers	Cultivators	Laborers
	in 1971	in 1971	in 1971	in 1971
Cultivators in 1961	.832** (.019)	.001 (.030)	.932** (.016)	.133** (.037)
Laborers in 1961	-.026** (.009)	.778** (.015)	-.021** (.007)	.807** (.018)
Crop in production in 1961	.053 (.028)	-.007 (.048)	.014 (.021)	-.132** (.050)
Crop production in 1971	.087** (.025)	.132** (.042)	.044** (.018)	.169** (.043)
Total R ²	.944	.957	.972	.953
Variance explained by crop production	.013	.003	.002	.002
% of residual variance explained by crop production	.185	.074	.053	.047

** p < .01

Standard errors are in parentheses.

The conclusion is that the number of hired laborers is more immediately responsive to agricultural conditions than is the number of cultivators. This is not surprising since wage laborers are both more geographically and occupationally mobile than landed cultivators. When production increases in a given year, the increased demand for labor is met *in the short term* by hired workers. These workers can migrate from less productive regions or are drawn out of marginal employment in household industry or service work (Singh, 1979).

The equations in Table 4 also report the effects of 1961 production levels controlling for 1971 production levels. Except for the equation for rural male laborers, the 1961 production coefficients are quite small. The negative coefficient for 1961 production in the rural male laborer equation must be interpreted in light of the controls for 1971 production. The negative coefficient indicates that for two districts

Table 5 Predicted Population of Laborers and Cultivators in an Average District with High or Low Change in Crop Production

	1961 Starting Point <u>Actual India Mean</u>	<u>1971 Predicted Population</u>	
		Low Change District <u>(-20 million Rupees)</u>	High Change District <u>(+ 168 million Rupees)</u>
Rural Male Laborers	53,518	93,905	109,704
(Percent Change 1961-1971)		(75.46)	(104.98)
Rural Male Cultivators	204,975	209,247	218,033
(Percent Change 1961-1971)		(2.08)	(6.37)
% Laborers	20.7%	31.0%	33.5%

with equal current production, the district with *lower* production in 1961 had a greater increase in landless laborers. In other words, not only a high rate of current production but also a rapid rate of growth in production increases the number of landless laborers. This result fits with the reasoning that landless laborers are the most immediate source of workers to meet the labor demands of increased production (Dasgupta, 1973; Day and Singh, 1977).

The predicted number of cultivators and laborers for two average districts, one with low and one with high production levels in 1971, are presented in Table 5. Since the districts are equated on 1961 levels of production, the low production district experienced an actual decline in production while the high production district substantially increased production levels. While the declining district would have added less than 5,000 cultivators during the 1960s, a change of about 2.1 percent, with increasing production a district would have added over 13,000 cultivators, an increase of 6.3 percent over the 1961 totals.

The number of laborers responds rather immediately to agricultural development. The district with a decline in agricultural production would experience an increase from 54,000 rural male laborers in 1961 to 94,000 in 1971, or 75.5 percent. Although this growth is impressive, the high growth districts with identical 1961 populations would experience an increase to 109,000 laborers, or 105 percent. Because the number of laborers responds so quickly to growth in agricultural production, the percent of landless laborers also increased from 20.7 percent in 1961 to 31.0 percent in the declining district, and to 33.5 percent in the fast growth district. Even for these short-term changes, the effects of agricultural growth account for only a fraction of the all-India increases in landlessness.

SUMMARY AND DISCUSSION

The analysis of the long term effects of agricultural productivity suggests that higher production does not necessarily lead to higher than average levels of proletarianization. After ten years, the number of agricultural laborers may have grown, but this growth is not proportionately any faster than the growth of landed cultivators.

These results contradict the prevalent belief that the growth of agricultural production produces a crisis of landless labor. There are two major reasons why this study has uncovered patterns different from

earlier research. First, as mentioned, the scope of this research is an entire nation not just the productive regions. The national scope enables us to distinguish between the general nationwide trend of increased landless labor and the specific effects of high production. Comparing highly productive regions with less productive regions provides no evidence that the growth of the landlessness ratio is any faster in the former.

A second reason for the discrepancy between these results and common expectations is suggested by the short term effects reported in Tables 4 and 5. These equations establish that the immediate effects of high production are likely to be higher ratios of landless laborers to cultivators. These short run consequences have probably been the changes observed in much earlier research. The present study has been able to document those changes in a pattern of results (Table 5) that conforms to the accepted wisdom. However, by adding data from a longer time perspective, the research provokes serious questions about whether the immediate increase in landlessness documented by the short run analysis is an enduring transformation.

There is ample reason to justify our skepticism about agricultural production causing increased landlessness. V.S. Vyas (1976) has identified the four most commonly cited sources of the increased numbers of landless laborers:

1. Natural population increases.
2. Dispossessed small farmers.
3. Artisans and other non-agricultural workers.
4. Additional redundant workers from small-farm households.

Of these, the first is inadequate as an explanation of changes in the landlessness ratio because we have no reason to expect the natural population increases to be greater among the families of landless laborers than among the families of landed cultivators. Thus, Clifford Geertz (1971) describes agricultural involution in Indonesia as the gradual intensification of traditional rice farming in response to population growth. The densely populated regions in Indonesia apparently have adjusted to population growth by farm fragmentation, suggesting a growth in the number of cultivators in productive regions along with the inevitable increase in low paid surplus labor.

The second source identified by Vyas, dispossessed small farmers, is a true proletarianization explanation, and would have the most effect on the landlessness ratio. For, the loss of small farms simultaneously

subtracts cultivators from the denominator and adds laborers to the numerator. But the explanation suffers from the lack of supporting evidence, because few dispossessed farmers turn up in any research. Indian peasants are as fanatical as any in their devotion to their land (Srinivas, 1976); and few have any inclination to part with their holdings, no matter how small, except under the most extreme circumstances. High levels of production would retard, not accelerate, such sales. Nor is there any evidence of foreclosures playing much of a role in transforming landed cultivators into landless laborers. Even if we grant that much of the benefit of the increases in agricultural production has been appropriated by the larger landowners, there is no reason to believe that the smaller owners are threatened more by increased production than by low levels of production. In fact, there may be instances of upward mobility from landlessness to the acquisition of small holdings as well as dispossession (Atwood, 1979; Bhalla, 1977).

Vyas' third source of increased landless labor, non-agricultural workers, probably does add to the numbers of landless laborers in the high production districts. Increased production does increase the demand for agricultural labor and draw workers out of more marginal employment in other sectors. Further analysis, not reported in detail here, supports this explanation, since high production districts are associated with relative *decreases* in the numbers of almost all the other census categories of workers (artisans, trade, construction, and service). This factor, together with interdistrict migration, probably accounts for the positive effect of production on landlessness in the short-term analysis (Table 4).

The role of the division of family land holdings in increasing the numbers of landed cultivators in the high production districts has often been overlooked. Gould (1968) has suggested that agricultural development probably accelerates the process of dividing the extended family after the patriarch's death. Certainly, higher yields make division of the lands more economically possible, whereas low yields would encourage one or more sons to try to supplement the production of the family holdings with rural or even urban wage labor. Vyas identifies impoverished households as one of the main new sources of landless laborers, but this supply of redundant family labor is sure to be less plentiful in the more productive districts. Brothers do not want to give up their share of agriculturally productive land. Sons may even come back from working outside the village to claim their share of productive farmland (Kessinger, 1977). Thus, those regions which are ag-

riculturally wealthy may face a slow but steady fragmentation of land-holdings (Bhalla, 1977). In the long term this would produce an increase in the number of cultivators. Furthermore, as the size of the holdings decreases, the demand for outside hired labor should decrease as well. Mellor (1976) has even hypothesized that in response to the Green Revolution changes, the landowning class will eventually assume a *higher* proportion of labor activities. These are slow, cumulative processes but they may eventually counteract the more immediate changes, which draw labor from non-agricultural employment and from poorer areas.

Other alternative explanations might account for the results reported in Tables 2 and 4 that would still be consistent with a proletarianization hypothesis. It may be that the high production in 1971 was qualitatively different from the high production in 1961 so that recent development may produce an enduring landlessness in a way that earlier production did not. For instance, the increased importance of more *land-intensive* inputs (e.g., higher yielding hybrid seeds, fertilizers, pesticides) may explain the more recent growth in the number of laborers. Earlier development may have resulted from more *extensive* methods, bringing new land under cultivation. The effects of different *types* of agricultural development can be tested with further research. For the moment we can say that increases in the sheer quantity of production do not necessarily cause increased landlessness. Agricultural production causes increases in the *number of farmworkers*, with *both* laborers and cultivators contributing to this growth.

These results for Indian agriculture testify to the complexities of the linkages between overall levels of production and patterns of inequality. There is no simple direct effect of increased production on inequality. It may even be that it would be most fruitful to think of these as *independent* phenomena. Thus, the causes of the nationwide rural proletarianization in India might be better sought in political factors (Mencher, 1978), such as the success or failure of land reform implementation, the growth of union organizations among landless laborers, the presence of oppressed minorities such as India's scheduled castes (Harijans, the ex-Untouchables), and the political strength of the land owning castes. Beyond such political factors, population growth within the context of limited new land, the economic opportunities outside of agriculture, and the technological requirements of different crops undoubtedly play a role in determining levels of landlessness. Thus, the important determinants of landlessness and agrarian inequal-

ity are not the mere existence or failure of agricultural development but the social and political context of increased production. It is *how* agricultural change occurs, and not *whether* it occurs, that is crucial for determining its social effects.

Of course, one can take little comfort from the overall trends. Landless labor is increasing throughout the countryside and the exploitation of this most depressed sector has not been alleviated. Recent violence against Harijan laborers suggests that the landed-landless conflicts are intensifying throughout India. The traditional ties between agricultural laborers and landed cultivators have been weakened by an increasing monetization of agricultural wages. The partitioning of family holdings and the growth in the number of small cultivators could result in fragmentation of holdings and the substitution of family labor for hired labor, which would only worsen the lot of those who have no land at all. The demand for wage labor may decrease as the population base and political power of the dominant class widens (Laxminarayan, 1977). The continued deprivation of the landless sector seems a far more likely trend than an improvement in their condition.

But the point to be made is that increased production will not necessarily worsen the situation of the landless. Growth in agricultural production is still a desirable goal and, as Mellor (1976) has argued, potentially the most egalitarian of the present alternatives. If the growth of agricultural production did entail a rise in landlessness we might well question the benefits of an agriculture-led strategy of growth. These Indian data do not warrant such a pessimistic evaluation. Both the optimism and the pessimism surrounding the early successes of the Green Revolution should be tempered with the knowledge that growth in agricultural production alone will not solve the problems of unequal distribution of wealth—nor will it necessarily aggravate those problems. Agricultural development is apparently neither a cornucopia nor a Pandora's box of agrarian social problems.

NOTES

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1. Our district findings support this relationship for 1961, but it weakens for 1971. The correlation coefficient for the relationship between 1961 yield per acre and percent rural landless laborers is .207, but for 1971 it is only .043.

2. Most of the 21 districts not included in the study are those containing the major cities, the off-shore districts (Andaman Island, etc.), several former foreign enclaves (Goa, etc.), and some of the tribal districts. Except for Bombay, which was excluded because it had no rural population, 1961 agricultural production data were missing for the excluded districts. Adjustments were made to compensate for a number of changes in district boundaries between 1961 and 1971.

3. A person was included in the 1961 workforce if he/she worked in some economic activity, even for one hour a week but was in the 1971 workforce only if it was a major activity. The more restrictive 1971 definition eliminated from the workforce many women, children, and elderly who perform minor economic roles in addition to household ones. One result of the change in definition is that the size of the labor force appears to decrease over the decade. Some of the increase in the laborer-to-cultivator ratio may also be attributed to the definitional change. But these nationwide changes would not affect the districtwise analysis, provided that the resulting changes in the census counts were reasonably proportional across all districts.

4. The 12 major crops are: rice, wheat, jowar, bajra, maize, ragi, barley, tur, gram, groundnut, cotton, and sugar cane.

5. According to our data, a high production district in 1961 yielded crops worth about 200 million rupees, while a low production district generated about 80 million rupees. Because the rural male workers census category was least affected by the 1961-71 definition change, we used the mean value of rural male cultivators and laborers (see column 1 of Table 3) to calculate the predicted value for 1971.

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