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THE POLITICS OF THE GREEN REVOLUTION:

SHIFTING PATTERNS OF PEASANT PARTICIPATION IN INDIA AND PAKISTAN

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by Francine R. Frankel

Until the mid-1960's, lagging growth rates in agriculture imposed a major constraint on the overall prospects of economic advance in Asia. Then, the development of new high-yielding varieties of paddy and wheat reported from Taiwan and Mexico provided the opportunity for a decisive technical breakthrough in productivity. The new seeds, supported by a package of modern inputs, including very high doses of chemical fertilizer, pesticides and controlled water proved capable of doubling yield levels over the maximum potential output of local varieties. Between 1965 and 1969 substantial gains in food grain production ended decades of dependence on imports in several Asian countries. The Phillipines expanded rice production by 17 percent. Ceylon and West Pakistan achieved crop increases closer to 40 percent and actually produced surpluses.

Even more spectacular gains occurred with the production of wheat. In India, rapid expansion of the area under Mexican varieties pushed up total output by almost two-thirds between 1965 and 1970. In West Pakistan, the wheat harvest increased by almost 70 percent in the brief period between 1965 and 1968; by 1970, modest surpluses were available for export.

The economic achievements of the green revolution are by now quite clear. The social and political consequences are more problematical. For one thing, so long as Asia was faced with the imminent danger of severe food scarcities it was natural that planners should give full attention to the problem of increasing production. Only recently have the other effects of

This paper could not have been written without the contribution of Karl von Vorys to the formulation of the analytical framework and analysis of the politics of Pakistan.

rapid agricultural modernization on social structure and political process achieved equal salience. Moreover, too little time has elapsed since the advent of the green revolution to establish the direction of long-term trends. Finally, there is the problem of measurement. There are no equivalent yardsticks to the economic measures of yield per acre and total production in making precise calculations about the complex of social and political changes created by rapid technological innovation.

Unless, however, a determined attempt is made to consider the social and political consequences of the green revolution we can have only a partial understanding of the benefits and costs of rapid agricultural modernization. This paper represents an effort to deal directly with the cluster of non-economic changes triggered in traditional peasant societies by the rapid introduction of modern technology and commercial forms of economic life. Briefly summarized, the central thesis of this analysis can be divided into four related parts: (1) In the agro-economic setting of the Asian countryside, the introduction of capital-intensive technologies inevitably increases economic disparities between the small group of surplus farmers on the one hand, and the majority of subsistence cultivators, sharecroppers and landless laborers on the other; (2) The response of large farmers to commercial incentives results in an accelerated erosion of traditional norms of agrarian relationships based on the exchange of mutual, albeit nonsymmetrical, benefits and services that have historically provided a justification for inequalities between the propertied upper and middle status groups and the landless low castes and classes; (3) The immediate result is a decline in the moral claim of landed elites to positions of authority and the collapse of vertical patterns of peasant mobilization; (4) Over the long term, large numbers of the landless become available for participation in new political commitments and groups based on egalitarian values and class struggle doctrines.

Systematic testing of this analytical model would require the collection of comparative data in all the Asian countries currently experiencing the agricultural revolution. Obviously, there has not been the time to carry out such an enterprise for the purposes of this paper. However, the empirical portions of the discussion represent an effort to test this model against available data for two critical cases: the wheat belt of Punjab State in India and the adjacent wheat areas in Former Punjab of West Pakistan, both regions of the subcontinent where the economic transformation wrought by the green revolution is most advanced.

I

An appropriate point of departure for these hypotheses are certain relevant common characteristics of traditional societies in Asia. First, social order was based on mutual, non-symmetric obligations between groups unequal in status, wealth and influence. In a typical transaction, the low status actors received material goods and services, e.g., land, house site, clothing and fuel that helped alleviate environmental threat. High status actors received more intangible benefits, including esteem, deference, personal service and loyalty in factional disputes. Order was, moreover, enforced by extra-mundane sources. Roles were assigned by ascription: rules were perceived as the necessary extension of a supernatural will. The fulfillment of their obligations to each other was a divine imperative for high status and low status persons alike.

Traditional societies were economically self-contained. Most of the goods produced within their domain were also consumed there. There was limited trade, and most exchanges were in kind. All members had a customary right to a proportional share of the collective agricultural product, and except in times of natural catastrophe, they were assured of receiving a minimum of subsistence. Income distribution was unequal, but significantly, the disparities were relatively modest. Communal property rights, the small scale of production and markets and the rudimentary technology,

all imposed low ceilings on accumulation. Given the principle of proportionate crop share, moreover, most persons benefited from a good harvest, and there was general incentive to work together toward it.

All this, of course, does not mean there were no conflicts, no stresses and tensions in traditional societies. However, the tendency toward instability was mitigated by two factors. First, there was little opportunity for comparison. Most persons lived out their lives within narrow kinship patterns, and in their immediate locality. They had little opportunity to meet strangers: when they did, they were filled with apprehension. Secondly, as aggrieved or frustrated as anyone felt, there was really little alternative. An individual had no identity outside of his group, and no other place where he could expect a welcome. Traditional society only rarely had to apply physical punishment to exact conformity: ostracism was penalty enough.

Just when traditional societies began to destabilize and what initially triggered this development is subject to conjecture and controversy, but the European penetration of Asia is recognized as a major catalyst in this disruption. It was during this period that the crucial safeguards of traditional societies were critically impaired. For one thing, this encounter was marked by a rapidly declining cost of comparison. Regular exposure to alien commercial, military and administrative personnel brought awareness of a different way of life. Meanwhile, improved prospects of travel offered new opportunities to become personally acquainted with Western consumption patterns. The period was, moreover, marked by a declining cost of mobility. A growing number of urban centers provided not only a haven of anonymity for those who otherwise would have to suffer the sanctions of traditional norms but also a genuine alternative for anyone who found small-scale groups unduly confining.

In South Asia, the encounter with an alien culture was aggravated by growing Western military and political hegemony. Europeans came to trade

and their colonial control was established to facilitate this objective. Traditional societies could not remain economically self-contained for long. Insistently, colonial policy encouraged the shift from subsistence farming to production for extended markets. Railroads were introduced; roads were built; in some rural areas, irrigation canals were constructed. In turn, agricultural and other primary products, and through them, an increasing share of production, moved out of traditional societies to urban centers and abroad. Such transactions, across the boundaries of small-scale groups, could not, of course, be conducted in kind. Abetted by colonial policy, the dominant role of money as a medium of exchange was being established.

In the rural areas closest to the towns, expanding demand for agricultural commodities brought better prices. Where irrigation was introduced, a floor was set below which output in bad weather years would not fall. Yet, even when income improved the propensity to invest remained low. Perhaps because most capital projects were initiated by the public (colonial government) sector, or the new technology introduced was massive in form and unsuitable for private ownership, the marginal rate remained close to zero. Increments in income were consumed, and consumed in the traditional manner: on religious rituals, social obligations and luxuries. As a matter of fact, many consumed more than their increments in income. Credit became much easier as the result of another innovation of colonial rule -- the recognition of individual property rights. Originally intended to facilitate assessment and collection of rural taxes, private ownership also provided cultivators with tempting collateral for loans. Many could not resist the blandishments of professional moneylenders and became debt-ridden. When the colonial authority lent the power of its legal system to enforce foreclosures, the cultivators who lost their land sometimes moved to the towns, but most remained and continued to work the same land as before. The difference was this: they became tenants or laborers, while others -- a few -- accumulated land. This, and the growing population

explosion during the later years of the colonial period, introduced a genuine basis for substantial disparities of income in traditional society for the first time.

Economic disruption, naturally, was not without social consequences. Ascriptive definition of roles was no longer quite as decisive. The expansion of scale was especially hard on village artisans. Though they provided crucial services for centuries, industrial competition severely contracted the local demand for hand-crafted products. In contrast, moneylenders, perpetual pariahs, were acquiring a measure of recognition if not legitimacy. Though some moved to the city when the colonial power reversed its policy and attempted to check the dramatic transfer of land to non-agriculturalists, many decided to assume the role of landlords in the traditional pattern. Money-lending against mortgages was meanwhile taken over by the larger landowners who were not reluctant to make a profit, but were more eager to add to their property by taking over the land. In their personal preferences, they began to look to the towns and the colonial power for normative reference. Yet, when it came to their relationships to their fellow members in the traditional societies, in spite of all the changes and distractions of the colonial experience, most honored or appeared to honor, their customary obligations. All along, moveover, medium and small landowners continued to conform to them. The growing number of the landless relied upon them for their security.

Admittedly, this describes only a general trend. The impact of the colonial experience was uneven. In urban areas, new hierarchies emulating western status patterns and preferences emerged rapidly. In contrast, some remote areas in the countryside were hardly affected at all. In between were vast regions where traditional societies still prevailed but were challenged and disrupted, at an accelerated rate near towns and cities, more slowly in the hinterland.

Independence was attained after a struggle that usually united the urban elites and the rural masses against the colonial power. The former wanted to participate more fully in western consumption patterns and the western doctrine of political equality. By contrast, the latter sought relief from the disruptive pressures of the modern impact and wanted to restore the age-old patterns of traditional societies. Accordingly, for an initial decade or so, development planning emphasized the introduction of modern technology in the urban industrial sector, but sought to restore and utilize the social integrity and economic patterns of traditional society for economic advances in the countryside. The major structural initiatives in agriculture were designed to reverse the trend of growing economic disparities that had undermined social cohesion in village life. These included proposals for land reforms -- ceilings on individual landownership, the elimination of absentee landlords, security of tenure and lower rents for tenants -- and the creation of rural cooperatives to break the stranglehold of moneylenders and middlemen on production credit, marketing and trade. Moreover, to a striking extent, the post-Independence leadership relied on the strength of the traditional norms of mutual obligation to ensure that increases in production were more or less equitably distributed among the landed and the landless. Indeed, the selection of methods of agricultural development reflected this primary reliance on attitudes of cooperation between the landed and landless groups in designing village development programs that required the voluntary contribution of cash and labor for the construction of capital projects, as well as general collaboration for the application of more efficient labor-intensive practices.

By the late 1950's, it became clear that the key assumptions of the agricultural development strategy were unwarranted. While the dominant landed classes did not abandon their obligations to the landless, neither were they willing to sacrifice the material gains of the colonial period for

the less tangible rewards of the traditional society in increased deference, esteem and loyalty. As a result, it was not possible to appreciably reverse the disparities inherited from colonial times. Moreover, from the point of view of development goals, the planners achieved the worst of all possible worlds. On the one hand, lack of economic incentives to individual investment in agricultural modernization restricted the advance that might be made through an entrepreneurial strategy. On the other, in the absence of effective agrarian reform and strong cooperative institutions, it proved impossible to rely on traditional incentives and techniques to generate an agricultural surplus. In fact, to the extent that the dominant landed classes monopolized such opportunities for productive investment as did exist, disparities increased, and it became even less likely that the traditional norms of mutual obligation could be used as effective instruments of equitable distribution under rural development programs.

Growing awareness of the limitations of traditional social patterns for purposes of agricultural development, combined with an emergent agricultural crisis as a major factor in restricting the overall rate of industrial advance, stimulated a reassessment of the basic assumptions, methods and techniques of agricultural planning. By the early 1960's, planners became increasingly open to the consideration of a new approach that would provide improved economic incentives for individual investment in modern inputs as the best hope of achieving rapid gains in production. Moreover, just as this redefinition of the agricultural strategy took hold, the opportunities for the application of modern science and technology to production, dramatically increased. The productivity breakthrough of the green revolution provided a technical opportunity which development planners were more than willing to seize.

For the first time, with the green revolution, modern science and technology were introduced into the agricultural sector not as massive public projects, but as divisible inputs available to individual cultivators. The new techniques offer an unprecedented opportunity for large, and even medium landowners to reap substantial profits very quickly through investment in irrigation and modern inputs. The attractiveness of sizeable rewards and the ease of achieving them raise the propensity to invest to unprecedented levels and place a premium on capital accumulation. Inevitably, the social obligations of traditional agrarian society are reevaluated in terms of commercial norms. The old pattern of diffuse, customary relations still pervasive in village economic life cannot stand the test of profit maximization: landowners move rapidly to substitute specific, impersonal and contractual arrangements for work done. Yet, at the same time that the landed classes increase their advantages by striking margins, yet neglect their traditional function of providing security to landless groups, the demonstration effect of the new technology seriously undermines the legitimacy of all disparities established on the basis of ascribed social roles. The evenhandedness of the scientific method -- the observable fact that high-yielding varieties, water and fertilizer work as well on the small plot of the low status sharecropper as on the large estate of the high-born landlord -- gives rise to the notion that all strata of society can legitimately claim a share in the new prosperity.

The green revolution, therefore, is the instrument of ever more complete erosion in traditional social and political forms. In those areas where the new technology has been most extensively applied, it has accomplished what centuries of disruption under colonial rule failed to achieve, the virtual elimination of the stabilizing residuum of traditional society, the recognition of mutual non-symmetric obligations by both the landed and landless classes. On the one hand, the departure from traditional norms of crop sharing to cash payment for specific work done is justified by the

landowners as ensuring equitable returns to investment on innovation. On the other, the landless are convinced that landowners have violated accepted standards of justice. They are also persuaded by the universality of gains under the new technology of their right to an adequate share. Increasingly, the landless have turned to politics as the major vehicle for redressing their grievances. The foremost consequence of the green revolution, therefore, is the direct participation of the peasantry in the political process. As rapid modernization erodes customary forms of reciprocity and obligation, traditional leaders, drawn from the dominant landed classes, lose their moral claim to the exercise of authority. The increasing divergence of economic interest and growing disparities between landed and landless groups destroys the viability of vertical patterns of peasant mobilization, especially the capacity of landed elites to act as brokers between the peasantry and the political system. Rather, in developing countries where popular participation is encouraged as part of a nation-building strategy, peasant mobilization will increasingly mean heightened class consciousness and zero-sum political conflict between the minority of prosperous landowners and the majority of small farmers, tenants and laborers, either through new horizontal electoral realignments or rural agitation and violence.

II

The State of Punjab in India presented an unusually favorable environment for rapid modernization of agriculture once modern techniques became available. By the 1920's, the area was converted into one of the most prosperous regions in British India by the construction of an extensive canal network. The villages closest to road, rail and market towns experienced the greatest improvement. Higher prices for agricultural commodities raised the income of large landowners: a few experimented with improved methods of cultivation. Others with little land to farm were even more

enterprising. Many emigrated to other countries in the Commonwealth where they worked as laborers. Some joined the army and traveled widely abroad. When they returned home, it was not only with unaccustomed savings, but also with an appreciation for the material benefits of technology.

These positive attitudes toward change persisted during the first decade of economic planning after Independence. The Punjab outdistanced other Indian States in physical achievement on various items of agricultural development, including adoption of chemical fertilizers, the distribution of improved farm implements and installation of tubewells. Indeed, between 1952-53 and 1964-65 Punjab had the highest growth rate in agricultural production in India, averaging 5.5 percent per annum.[1] In wheat, the major food-grain crop, it achieved a production growth rate of 6.7 percent per annum, mostly from extension of area under crops.[2]

All along in the villages the pattern of mutual non-symmetric obligations between the landowners and landless did not visibly weaken. A case in point was the response to the Punjab Security of Tenures Act of 1953 which sought to give tenants legal rights of occupancy and to lower the maximum rental from the customary rate of one-half to one-third of the crop. The landowners, convinced that the legislation was an unwarranted attack upon their legitimate property rights, reacted with widespread ejection of tenants, usually on grounds (permitted under law) of land resumption for personal cultivation. Between 1953 and 1955, the number of tenants recorded in village land records decreased by over 86 percent, from 583,000 to little over 80,000.[3] Still, much of this appears to have been primarily a formal exercise. Landowners continued to permit tenants to work their land; presumably the tenants continued to pay the customary crop-share. Evidence for this comes from the following sources. Notwithstanding the fact that the percentage of area leased out to area owned contracted from 30 percent in 1954 to 13 percent in 1961 as reported in government survey data based on village land records,[4] the 1961 Census,

drawing on evidence supplied by cultivators, found that 39 percent of all cultivating households in the Punjab were still taking land on lease.[5] This was almost exactly the proportion reported in the 1954 government survey on land holdings based on entries in village land records before the names of tenants had been largely erased.[6]

In turn, tenants and agricultural laborers continued to respect the traditional definition of economic arrangements. In 1956-57 over 46 percent of all agricultural labor households were employed for the duration of the crop season and received payments as a proportion of the total harvest, including some meals, commodities and interest free loans in kind or cash.[7] Although there was some tendency toward substitution of kind by cash for casual labor, in general, agricultural workers were free to choose the type of compensation they preferred. Payment was at customary rates. Despite the fact that labor shortages often developed during the peak harvest season, no organized attempt was made to bargain with landowners over wages.

Further support for the contention that the traditional pattern of mutual obligation existed beyond the initial years of Independence may be found in the political record. Such limited data as is available suggests that prior to the creation of the two States of Punjab and Haryana in 1966, all major parties in the State were factional coalitions built on extensive and localized patterns of vertical mobilization. The leadership of the secular Indian National Congress, the communal Akali Dal, indeed, even the Communist Party of India, was recruited from the high-caste landowning classes, especially the Jats in the Sikh community and the Jats and the Rajputs among the Hindus. Although the Harijans (former untouchables), most of whom were landless and employed as agricultural laborers and village menials, benefited from constitutional guarantees assuring them of proportional representation in the State Legislature, they were given only token representation in government ministries and excluded from effective power.[8]

As a matter of fact, until 1966, while the boundaries of the State largely coincided with India's share of the pre-independence province, the basic political issue was communal. Roughly two-thirds of the population were Hindus; one-third Sikhs. An aggravating factor was the geographical concentration of both communities in compact areas: the Sikhs in the Punjabi-speaking region of the State where they enjoyed a 55-42 percent edge over the Hindu population; and the Hindus in the Hindi-speaking Haryana region where they accounted for 90 percent of the population. The demand for a separate Punjabi-speaking State taken up by the Sikh based Akali Dal shortly after Independence dominated Punjab politics for almost two decades. Although both religious groups were internally stratified between the landowning castes and the landless, the overriding communal issue was effective in maintaining solidarity across class lines.

Between 1952 and 1962, the Indian National Congress was the dominant party in the State. Using its secular stance to good advantage, the leadership successfully appealed to the fears of both the Hindu minority in the Punjabi-speaking region, and to Sikhs in the Hindu area; Congress governments alternated between appeasing the separatist Sikhs in the Akali Dal with lavish government patronage and punishing recalcitrant agitators through police action. By 1966, however, continuous mass demonstrations organized by a new, more militant Akali leadership, finally forced the central government to concede the demand for a separate Punjabi-speaking State and the two States of Punjab and Haryana were created. It does not appear that this decision had any immediate impact on vertical patterns of peasant mobilization.

The year 1966-67 marked the beginning of unexpected change. Punjab entered a new phase of economic, social and political development. The advent of the dwarf varieties of Mexican wheat offered unprecedented opportunities to innovative farmers to double output and almost double net income. The profitability of adopting the new technology is illustrated by

the following figures for Ludhiana District, the showcase area of the green revolution in Punjab. In 1966-67, the average yield of local wheat varieties was 2,108 pounds per acre, a little less than 10 quintals. During the same year, those farmers who adopted the Mexican varieties achieved an average yield of 4,235 pounds per acre, about 20 quintals or exactly twice the first amount.[9] Given the procurement price of Rs. 76 per quintal for Mexican varieties, the innovative farmer grossed about Rs. 1,520 per acre. Allowing for the cost of cash inputs of some Rs. 260 per acre, the net return to management was about Rs. 1,260. By contrast, the farmer growing local varieties, who probably sold his output at a somewhat higher price of about Rs. 80 per quintal, grossed only Rs. 800 per acre. Allowing for a lower cash expenditure on purchased inputs of about Rs. 40 - Rs. 100, the net income per acre was about Rs. 700 to Rs. 760.[10] On the average, therefore, farmers who adopted the high-yielding varieties in 1966-67 doubled their output, and in one swoop, increased their net income by over seventy percent.

The response to these new opportunities was immediate and dramatic. The number of private tubewells passed the 100,000 mark by 1969.[11] In two years, from 1966-67 to 1968-69, consumption of chemical fertilizers increased threefold.[12] In the short period between 1966-67 and 1969-70, over 65 percent of the total wheat acreage was planted under the new Mexican varieties.[13] Altogether, total wheat output was doubled in four years, from 2.4 million metric tons in 1966-67 to 4.8 million metric tons in 1969-70.[14] During the same period, average wheat yields gained by about 46 percent, from approximately 1,300 pounds to 1,900 pounds per acre.[15] Moreover, the State saw a trend toward mechanization that promised even greater efficiency in the exploitation of the new technology for intensive cropping. By 1969, there were at least 20,000 tractors in use, with effective demand estimated at 10,000 to 12,000 tractors annually.[16] Even larger increases

in the demand for smaller machines, especially seed and fertilizer drills and threshers are reported. In 1970, the first harvesting combines were introduced.

The social and political consequences of the agricultural revolution are more difficult to assess. It seems reasonable to assume however that the gains have been unevenly shared. The high-yielding varieties were introduced into an agro-economic environment that was already characterized by substantial disparity in the distribution of holdings. The National Sample Survey, 1961-62 reported that more than 37 percent of all rural households operated farms of less than five acres and accounted for little over 7 percent of the area. By contrast, the top 13 percent of all households cultivated holdings of twenty acres or more, and controlled over 40 percent of the area. Table 1 below shows the distribution of cultivators and cultivated area in the Punjab by size of operational holding in 1961-62.

Table 1

Distribution of Cultivators and Cultivated Areas in Punjab by Size of Operational Holdings, 1961-62

Item	Less than 5 acres	5 acres to 9.9 acres	10 acres to 19.9 acres	20 acres and above
Percentage of rural households in the group to the total sampled	37.5	24.8	23.8	13.4
Percentage of the cultivated area for the group to the total	7.4	18.3	33.0	40.7

India, The National Sample Survey, Number 140, Tables With Notes on Some Aspects of Landholdings in Rural Areas (State and All-India Estimates) Seventeenth Round, September 1961-July 1962, (Calcutta, 1966), Draft, 66

The situation after 1966 when Punjab was divided into the two States of Punjab and Haryana is less clear, but in general a similar pattern continued to prevail. According to a survey conducted in 1967 the mean size of some 58 percent of all holdings is less than ten acres. Estimates for the distribution of operational holdings by size class show the following: 65 percent of all cultivators have holdings of less than fifteen acres and account for 34 percent of the area; 25 percent of cultivators have holdings of 15 to 20 acres and account for 29 percent of the area; 9 percent of all cultivators have holdings of more than 30 acres and account for 27 percent of the total area.[17]

The point is that at the time the new technology was introduced into Punjab, the majority of cultivators were operating subsistence holdings of less than ten acres. Yet, only those who owned at least twenty acres were initially in a position to sustain the large capital investment that was a prerequisite to the efficient utilization of the package of high-yielding seeds, fertilizer and pesticides. The fact is that the irrigation canals inherited from the colonial period were inadequate. Constructed only to provide drought protection, they spread water as thinly and widely as possible -- and this over less than 60 percent of the area. By contrast, the new varieties require the application of water in quantities at least 25 percent to 50 percent higher than the levels needed by local varieties. In addition, controlled irrigation at fixed times in the growth cycle of the plant is essential to the realization of its high-yield potential. Supplementary water from a private tubewell is therefore necessary to the adoption of the new techniques. The cost of installation of the smallest tubewell, one commanding an area of twenty to twenty five acres, is about Rs. 4,000 to Rs. 6,000. Again, only the large farmers, those with holdings of twenty acres or more were likely to have the necessary funds for investment on more sophisticated equipment essential to the full utilization of the new technology, including improved ploughs, discs and harrows for proper land leveling; seed and

fertilizer drills for shallow planting and exact spacing of seedlings; and plant protection equipment to ward off rusts and other diseases. Finally, only large farmers who started off with these advantages were in a position to accumulate substantial surpluses for reinvestment in land, and for the purchase of agricultural machinery -- tractors, threshers and seed drills -- that permitted more intensive cropping and the diversification of the cropping pattern in order to include more profitable crops like sugar cane, cotton and orchards. Farmers with very substantial holdings of fifty acres or more experienced a qualitative change in their standard of life as a result of all these innovations which represents a new departure for rural India. They attained a level of prosperity in terms of consumption and the acquisition of amenities that compares favorably with upper middle class life in urban areas. Indeed, with land values increasing from about Rs. 1,000 - Rs. 5,000 per acre of irrigated land in 1965 to Rs. 5,000 or Rs. 10,000 and even Rs. 15,000 an acre, a landowner with fifty irrigated acres now owns landed assets worth some Rs. 2.5 lakhs to Rs. 7.5 lakhs and must be considered a wealthy man.

Given the powerful demonstration effect of the success of the new technology, it is not surprising that the spread of modern inputs was rapid. It is this extensive coverage that suggests all classes of cultivators are participating equally in the green revolution. Nevertheless, the circumstances under which the small farmer adopted the high-yielding varieties sharply limits his gains.

In the initial years, credit constraints restricted the rate at which they could adopt the new technology. In 1966, the Department of Agriculture and the Land Mortgage Banks insisted that only cultivators having twenty acres or more of owned land could be eligible for tubewell loans; this limit was reduced in 1967 to fifteen acres of owned land; a year later, cultivators with holdings as small as five acres became eligible. Both the appreciation of land values and less stringent eligibility requirements for tubewell loans

from Land Mortgage Banks now permit any five acre farmer with two unirrigated acres to mortgage to qualify for a loan of Rs. 5,000 repayable in seven equal installments. There is also plentiful credit available from village agricultural cooperatives to finance production costs. One obvious implication is that a substantial part of the profits that can be expected from the introduction of the high-yielding varieties on small farms will be siphoned off by debt repayment at least for several years. More serious, once having incurred this indebtedness, the small farmer is at a disadvantage in maximizing returns to his investment. He is denied the economies of scale enjoyed by larger landowners -- the optimum size of holding for the efficient cultivation of the high-yielding varieties assuming a tubewell is about 20 to 25 acres. Size limitation is also a crucial constraint on mechanization -- replacement of bullock power by tractors and other machines is considered economic only on holdings of 25 to 30 acres and above. In sum, once these limitations were taken into account, the ten to fifteen acre farmer would only make modest gains from the high-yielding varieties for some years to come -- proportionately much smaller than those enjoyed by large landowners. This is indirectly confirmed by the decrease in average yields per acre of Mexican wheat in Ludhiana reported in 1968-69 compared to 1966-67, from 20 quintals an acre to 14 quintals.[18] In the earlier year, mainly large farmers were involved; two years later, almost all cultivators had adopted the new varieties.

Farmers with less than ten acres were in the most unfavorable position. It appears likely that they actually suffered an absolute decline in economic position as a result of the green revolution. Part of the reason for this is the dependence of very small farmers on leased in land to put together an economic holding. According to an investigation of selected sample villages in Punjab State in 1966-67, the rented in component of operational holdings less than ten acres in size is as high as 27 percent.[19]

Still, with profits from direct cultivation increasing, there are now more farmers who want to lease in land than lease out. Moreover, those farmers who still give some land on lease usually demand a premium in higher rents. Since the introduction of the new technology, cash rents have increased by about one-third to one-half; crop share rents are moving from the traditional 50-50 division between the landlord and the tenant to 70-30 in favor of the landlord.[20]

The situation of rural laborers by contrast appears more favorable. Accounting for less than 10 percent of all rural households, they have never been so numerous as to suffer from the worst extremes of rural unemployment. Even in the mid-1950's, casual laborers could generally find some work for nine or ten months a year. Agricultural modernization and the growing prosperity of larger farmers have generated an increased level of economic activity and added to employment opportunities. In addition, cash wages for casual labor increased from about Rs. 2.5 in the early 1960's to about Rs. 5 daily in 1969.[21] These gains, resting as they do on higher demand levels for agricultural workers throughout the year, have been mitigated, but not neutralized by changes in the consumer price index for agricultural laborers which went up by 93 percent in Punjab between 1960-61 and 1967-68.[22] Another source of added income has been an appreciation in the value of the crop share payments received for harvesting work. Although the customary rate has been reduced from 1/40 to 1/30 of the crop, the gains to the laborers under this new formula are real, albeit limited. Compared to increases in net income of about 70 percent or more enjoyed by landowners from the introduction of the new varieties, laborers can expect to receive payments higher in value by about 25 percent over previous levels.[23]

The probable increase in relative disparities is less serious in its social implications than the final breakdown of the traditional system of mutual obligations between landowners and the landless that have accompanied these changes in income distribution. During the last few years, landowners have tended (indirectly or by implication) to redefine the terms of traditional agrarian relations. No longer recognizing the obligation to maintain customary rates of crop-sharing, they have deprived tenants and agricultural laborers of proportional participation in "good times" and the rewards of productivity. In traditional terms, they have violated the common notions of equity. Indeed, when landlords arbitrarily raise rentals in their own favor, and justify this action by arguing that tenants actually receive a larger absolute share from 30 percent of a higher outturn using modern technology than 50 percent of output at traditional levels, they reduce the scope of the relationship to a purely economic one, and the position of tenants to that of wage-earners. The reduction in customary rates of crop share payment for harvesting has the same corrosive effect on extended ties with farm workers.

Indeed, interviews with agricultural laborers in Ludhiana District in 1969 indicated that their gains under the new technology failed to ensure support for the system that produced them. On the contrary, they expressed a strong sense of grievance that the benefits of the green revolution are not being equitably shared. Actually, laborers are convinced that they should participate in the increased output in the same proportion as the landowners, i.e., at the traditional rate of 1/20. Landowners, for their part, believe that with the output of the new varieties roughly doubled, they are justified in reducing the laborers customary crop share for harvesting from 1/20 to 1/40. Indeed, the new rate of 1/30 is the result of a compromise, struck only when the laborers broke with age-old patterns of deference, and offered organized resistance for the first time, bargaining with landowners for increased wages and often threatening to work elsewhere if their terms were not met. Further, this substitution of customary status relations by

bargaining arrangements has precipitated an almost total breakdown in traditional ties. Landowners have been pressured into paying higher wages, but they have compensated for this by denying laborers customary rights of taking fodder from the fields for their animals or additional payments in kind of fuel and other commodities. A greater hardship for many laborers, and a source of deep hostility, is the landowners refusal to advance interest free loans, which used to be done for "good will", but which the landowners charge the laborers with breaching by adopting bargaining tactics. Moreover, large landowners are determined to convert all kind payments into cash. They are convinced that with the advent of labor-saving machines, which not only represent large capital outlays by the cultivator but also substantially reduce the manual labor exerted during farm operations, the traditional system of proportionate crop-share payments operates to exploit the innovative landowner. Some large landowners have already taken the final step toward complete dissociation from the traditional system by unilaterally redefining criteria of social status. No longer are surpluses used primarily to meet obligations within the village. Actually, some farmers have moved outside the boundaries of the physical village and built large farmhouses at the site of their fields. They have pursued their prestige through the acquisition of amenities, including refrigerators, telephones and even cars, that imitate the consumption standards set by the upper middle class in nearby towns, who now provide the most important model for emulation.

If the economic and social consequences of the green revolution are by now fairly well established, the political implications are just emerging. The 1967 elections proved to be a watershed in Punjab politics. The Congress party, unable to play on communal rivalries, won only 37 percent of the total vote compared to over 45 percent in 1962. Most important, it failed to win a majority in the Legislative Assembly for the first time since Independence. The major beneficiaries of the Congress party's decline were

the communal parties. The Akali Dal, divided between two factions, together won almost 25 percent of the vote compared to little over 20 percent in 1962. The Jan Sangh, a Hindu communal party also improved its position somewhat, from 7.5 percent of the total vote in 1962 to 9.3 percent in 1967, probably as the result of Hindu resentment at the formation of a Sikh-dominated State. The Communist Party of India which like the Akali Dal had built a political base among the Sikh proprietor castes by exploiting the communal demand for a separate State, suffered a decline once the claim had been conceded: it won less than 5 percent of the total vote compared to over 9 percent in 1962.[24]

The decision of the Sikh Akali Dal and the Hindu Jan Sangh to prevent the Congress party from forming a government by participating jointly in a United Front Ministry made it even more difficult to use the religious issue as a credible rallying cry for communal solidarity. Indeed, even though the United Front Government collapsed after only eight months, it was during this brief period that the Communist Party of India (Marxists), a radical left group that broke with the national C.P.I. in 1964, and won no more than 3 percent of the popular vote in the 1967 elections, began to make a determined, and by some reports, effective effort to carry Communist propaganda to the countryside.[25] The main target of their organizational work were the Harijans and other landless castes; the main inducement they offered was the promise of legislation to establish an eight-hour day for agricultural laborers.

Whatever the impact of these efforts, it seems clear that the political leadership of the major parties were alarmed. During the mid-term elections of February 1969, both the Akali Dal and the Congress party demonstrated a "rightward swing" in its attitudes. Specifically, both parties omitted standard promises of land reforms from their political platforms, and concentrated on issues having the greatest appeal to the large and medium landowners prospering under the green revolution, especially higher procurement prices for foodgrains, and all weather roads linking

villages to market towns. The strategy appeared to work. The landowning castes, whether in the Akali Dal or the Congress party maintained their leadership over local politics with little difficulty. Only two Marxist M.L.A.'s were elected in the State. At the same time, however, the strength of the Congress party declined further relative to the Akali Dal. The Akali's remained short of a majority in the Legislative Assembly, however, and another coalition government based on an Akali-Jan Sangh alliance had to be formed.

The impression of politics as usual continued for little more than a year. In August, 1970, the murder of several prominent landlords jolted the State Government into sudden awareness that the Naxalites, a revolutionary Marxist group, had established village cells in five districts of the State, including the most prosperous green revolution areas.[26] Although the police claimed success in hunting down "hard core" members of the movement, the legacy was a sharp increase in open hostility between upper caste landowners and Harijan laborers, and a rise in reported attacks against Harijans by goondas or thugs employed by the landowners.[27]

The most significant indication, however, of erosion in hierarchical patterns of mobilization was the national elections to the Lok Sabha (Parliament) in March 1971. The campaign was unusual for several reasons. First, the Indian National Congress, the dominant party at the Center and in most States since Independence had formally split into two rival Congress parties in November 1969, the New Congress party led by the Prime Minister, Mrs. Indira Gandhi, and the Old Congress party, headed by the President of the party, S. Nijalingappa. The political impact of the split was heightened by Mrs. Gandhi's insistence that the crisis was not a struggle for power but an "ideological conflict between those who are for socialism, for change...and those who are for the status quo."[28] Moreover, Mrs. Gandhi acted decisively to give substance to a new radical image. The Prime Minister nationalized fourteen major Indian banks, promised further action to curb big business, and in the agricultural sector, pledged speedy

implementation of existing land reform laws, and new legislation to lower ceilings on individual ownership of land.

Second, Mrs. Gandhi's decision to go to the electorate one year earlier than mandated, prompted by the frustrations of political dependence on smaller parties for parliamentary majorities after the 1969 split reduced the New Congress party to a minority in the Lok Sabha, also had the effect of separating the parliamentary elections from the State elections. The result was to minimize the advantage of incumbent opposition parties, including the Akali Dal in the Punjab, of mobilizing votes on the basis of local patronage networks controlled by district and State party leaders and M.L.A.'s through strategic allocation of government funds and services to faction leaders.

Third, the New Congress party paid little attention to strengthening the local party apparatus despite apparent organizational weaknesses. On the contrary, campaign strategy concentrated on projecting Mrs. Gandhi's image as a champion of the common man against vested economic interests. The appeal was direct. Mrs. Gandhi pleaded with the electorate to "strengthen my hands" against the forces of the status quo by giving the New Congress party a majority in the Lok Sabha. If the New Congress achieved a majority Mrs. Gandhi promised, she could carry out her campaign pledge to "put down poverty" and provide more jobs for the unemployed, place a ceiling on urban income and property and carry out effective land reforms.

When the results were tallied it became clear that the New Congress strategy paid off. The party contested eleven of thirteen seats and won ten. Only in one district, Patiala, did its electoral support fall below the performance of the undivided Congress in 1967. In three districts, Amritsar, Gurdaspur, and Hoshiarpur, it improved its position by at least 80 percent, (86 percent, 95 percent and 80 percent respectively). In four districts (Gurdaspur, Ferozepore, Patiala and Jullundur) it faced Old Congress candidates and defeated them. Two of these encounters were especially

dramatic. In 1967, Mohinder Kaur, running on the Congress ticket in Patiala polled 189,825 votes. Four years later, as an Old Congress candidate he received only 36,334. Similarly, in Ferozepur, Jagan Nath found his popular support shrink from 149,558 in 1967 to 8,613 in 1971 when he entered under the banner of the Old Congress. The two Punjab districts which the New Congress did not contest (Sangrur and Bhatinda) were won by its electoral ally, the Communist Party. By contrast, in 1967 Akali Dal candidates had little difficulty in winning both of them. In four years, however, the number of votes they polled declined in Bhatinda from 150,415 to some 119,760 and in Sangrur from 174,371 to 115,708.

The evidence is clear that for the first time in Punjab politics communal solidarity was breached by a class appeal. It is not sufficient, however, to demonstrate a direct link between the success of the appeal and the progress of the green revolution. To be sure, the New Congress and the Communist party did well in districts where the new technology has had maximum impact, such as Amritsar, Bhatinda, Jullundur, Ludhiana and Patiala. But they also did well in rural areas in other parts of the country where the green revolution is still little more than a slogan. The Punjab, moreover, is too small a state for meaningful comparisons between districts which adopted the new technology and others which have not. At this stage, all that can be said is that the recent record of Indian Punjab does not contradict the general hypotheses advanced above. Further evidence may be found in Pakistan.

III

There is, of course, another Punjab where these hypotheses may be tested. Part of the area which bore this name in colonial times became, after Partition, a component of Pakistan. It shared many of the traditions and circumstances of the Indian portion, but there were at least three salient differences. First, Pakistani Punjab contained greater extremes

of development and stagnation. In addition to the "central" districts where conditions were very like those in adjacent Indian Punjab, there were areas which were far less, and far more, advanced. The northernmost region around Rawalpindi, Attock and Jhelum, almost without irrigation or good roads, was the most isolated, impoverished and backward area of undivided Punjab. By contrast, toward the end of the nineteenth century, the construction of canals fed by the Jhelum, Chenab and Ravi rivers transformed the barren tract just south of this area into the richest agricultural land of British India. The settlers of the canal colonies, (Shahpur, Lyallpur and Montgomery), hand-picked by the British mainly from among the Jat Sikhs of central Punjab, started with the advantages of relatively large, compact holdings unencumbered by debt, and further prospered from the high prices offered for staple commodities in the nearby towns. Alert to opportunities for maximizing profit from production, the farmers in the canal colonies were the most innovative in the Punjab, taking the lead in the adoption of pure seeds and improved machinery.

Second, Pakistani Punjab was more highly urbanized than the Indian portion during the colonial period. Lahore, the administrative, as well as the cultural center for the entire region was located there. So were most of the military garrisons and headquarters establishments which grew into towns. The main rail lines and the highways (including the famous Grand Trunk) ran through this area, accounting for the emergence of commercial centers and even some industry. The cost of comparison and that of alternatives declined more rapidly there than perhaps anywhere in the subcontinent. New social hierarchies based on middle class norms were firmly established and even penetrated into the most prosperous rural areas. In the canal colony villages, large landowners found a new source of status in imitating the style of life of urban elites, constructing large brick houses with furnishings in the English fashion.

Third, in Pakistani Punjab village society was characterized by much greater economic disparities than in India. According to data collected by the Punjab Tenancy Laws Inquiry Committee, 1949, landowning in Punjab was distributed as shown in Table 2 below.

Table 2

Area Owned Including Uncultivated Area by Size of Holdings in Pakistani Punjab

Size of holdings	Acres		Number of Owners	
	(Thousand)	(% of total)	(Thousand)	(No. of owners)
Less than 10 acres	7,092	31.8	1,809	78.7
10 to 99 acres	10,428	46.7	476	20.7
100 to 499 acres	2,502	11.2	12	0.5
500 acres and above	2,295	10.3	1	0.1
Total	22,317	100.0	2,298	100.0

Source: West Pakistan, Report of the Land Reforms Commission for West Pakistan, January 1969 (Lahore, 1959), 13.

The significance of this data goes beyond demonstrating the very great inequality of landownership in the Punjab, with almost 80 percent of all rural households owning less than 32 percent of the land. Once we take into account official estimates that a minimum of 12 1/2 acres of land is necessary to constitute even a subsistence holding in the Punjab,[29] it is clear that the overwhelming majority of all agriculturalists did not own even the small area required for mere subsistence. This is further confirmed by the extremely high rate of tenancy in the Punjab - 48 percent of all cultivaters rented some land and the area actually operated under lease reached 56 percent, with most of the tenants drawn from among small owners seeking to piece together a subsistence holding.[30]

Despite the multiple strains of development, urbanization, and growing economic disparities on the social patterns of traditional society, the norms of mutual obligations survived the colonial period virtually intact in the rural areas - with the possible exception of modest attrition in the most exposed canal colonies. The crop-sharing system still linked the tenant and the landlord in a network of reciprocal rights and obligations. In areas of canal irrigation, the landlord and the tenant divided the responsibility for providing seeds, implements and bullocks and the payment of land revenue and water rate according to formulas established by local custom; rents were commonly paid as a proportion of the crop with the usual division 50-50 between the landlord and the tenant. A number of landlords also supplied their tenants with consumption loans during the year; and some did so without charging interest. Similarly, in the case of pure agricultural labor households which accounted for only 3 percent of the work force, customary arrangements still prevailed. Outside of the canal colonies, permanent laborers received most of their wages in kind, in many cases including meals, cloth, tobacco, and other concessions such as free house site. Casual laborers received a cash wage for daily work, but for the major farm operation of harvesting, they were also paid a fixed share of the crop.[31]

Independence, accompanied by the violence and dislocation of Partition, constituted a severe shock to the agricultural economy of Punjab. The loss of trained personnel, along with many of the most innovative Sikh proprietors, and even Hindu moneylenders and traders, left a gap in the rural infrastructure that was difficult to repair. During the 1950's, the production of wheat, the principal food grain crop, declined from 3.9 million tons in 1948 to 3.1 million tons in 1955.[32] While total area remained relatively constant at about 10.6 million acres, yields showed a downward trend from levels that were already among the lowest in the world, from 836 pounds per acre in 1948 to 664 pounds per acre in 1955.[33] In the early 1950's, only 2,000 to 3,000 tons of ammonium sulphate were used in the whole of West Pakistan, and this mainly on the cotton and sugarcane crops.[34]

On the eve of Pakistan's First Five Year Plan, 1955-60, food grains production was overwhelmingly subsistence in character. Arrivals of wheat in the urban markets of the principal wheat growing districts did not exceed 6 percent of total production. About 75 percent of the wheat grown was directly consumed by the producers.[35]

The First Five Year Plan did little to change this picture. Compared with a projected increase of 12 percent in wheat production, the overall gain was 4 percent.[36] Moreover, indigenous production could no longer keep up with domestic requirements: whereas no grain was imported during 1947-51, imports averaged 1,000,000 tons per year during the First Plan.[37]

The early years of the 1960's saw the first reversal in this trend. The new Martial Law Regime under President Ayub Khan took a policy decision to adopt an entrepreneurial strategy of development that would build on the private resources of the wealthiest farmers. This was apparent from the modest recommendations of the President's Land Reforms Commission in 1959 which set ceilings on individual ownership of land as high as 500 acres in order to encourage "the creation of a strong middle class and the laying of foundation for owner operated farms on holdings of economic size."[38] Equally important, government agricultural policies during the Second Plan created attractive incentives for private investment in land improvement and modern inputs. Not only were export duties on cotton, jute and other commercial crops progressively reduced, but in 1960, a new price policy for wheat was introduced in West Pakistan. All government controls on movement, prices and distribution were abolished, and the private trade was permitted to operate without restriction. Sales to the government were made voluntary: indeed, price support, government guarantee of a minimum price to cultivators, became the main purpose of state trading in wheat. A second major incentive to agricultural modernization was offered in the form of government subsidies on key inputs. Throughout the Second Plan, subsidies were provided for private investment on

tubewells and percolation wells, as well as for tractors and power equipment used in bringing new lands under cultivation. In addition, the government subsidized the price of chemical fertilizer by an average of 50 percent, reducing the domestic price by 30 percent below world market levels.

All of these incentives had the desired effect. During the Second Five Year Plan, 1960-65, the targeted increase of 17 percent in wheat production (from 3.6 million tons in the base period to 4.2 million tons in 1964-65) was modestly overfulfilled.[39] The annual rate of growth of 3.7 percent was sufficient to permit a small reduction in the level of food imports, but not nearly large enough to achieve self-sufficiency. In fact, the most striking advances occurred in the production of rice (7.8 percent per annum); cotton (7.6 percent per annum) and sugarcane (10.6 percent per annum).[40] Overall, however, the performance of the agricultural economy so improved over First Plan levels that the planners considered it "one of the most heartening aspects of the entire development effort in Pakistan."[41]

The most spectacular accomplishment, however, and the one that had the greatest demonstration effect in convincing farmers that non-traditional investments would bring very high rates of return was the unplanned expansion of tubewells in the private sector. Over a period of five years, the number of tubewells in West Pakistan multiplied almost five-fold from an estimated 6,500 in 1959-60 to over 31,500 in 1965.[42] Altogether, private tubewells accounted for a nine percent increase in water supplies in the Indus Basin, and this input alone was responsible for about 40 percent of the increased crop production in West Pakistan during this period.[43] Moreover, while the tubewells were clearly beneficial to the agricultural economy, they were also enormously profitable to the individual farmers who installed them. Those landowners able to raise the initial investment, ranging from Rs. 5,000 to Rs. 12,000 could look forward to realizing their outlay in less than two years and annual net returns in the value of total production of 45 percent to 65 percent. Assured supplies of water not only

permitted cultivators to bring additional areas under cultivation, to double crop part of their holding, and to diversify cropping patterns toward higher value products, it also increased the consumptive capacity of plants for chemical fertilizers and encouraged farmers to invest in yield enhancing inputs. As a result of all these innovations, by the end of the Second Plan, the gross value of crops on irrigated land having supplementary water from private tubewells was on the average nearly double that on comparable land.[44]

Even so, until 1966, the shift from production of wheat for local consumption to production for a wider market seems to have been limited. The bulk of private tubewells were concentrated in the cotton and rice area of West Pakistan; in the wheat zone of Punjab, agricultural innovation mainly took the form of higher applications of chemical fertilizer.

In any case, during this period, the traditional hierarchical patterns remained unaffected. In political contests, large landowners, if they chose, could expect to be elected. In 1951, provincial elections in Punjab, held on the basis of universal suffrage, had returned a legislative assembly in which about 80 percent of the members were landlords.[45] In 1956, before the imposition of Martial Law, about 72 percent of the members from West Pakistan in the National Assembly were landlords.[46] Similar patterns reemerged in 1962, when the first National Assembly under the new Constitution was established. Of the 75 members from West Pakistan, 58, or 76 percent of the total, were identified as landlords.[47] Even more relevant, as late as the Presidential elections of 1964, after party politics had been restored, all of the opposing groups reserved attention for economic and social issues to their party manifestoes which were almost exclusively directed toward the literate, urban audience. In the campaign dialogue, however, when the aim was to influence the bulk of the rural electors, these themes assumed a minor role. The overriding issue around which the parties polarized was the political question of the accomplishments of President Ayub's regime, his supporters claiming the gains of stability and gradually increasing participation, and his detractors charging

arbitrariness and corruption.[48]

The impact of the green revolution in West Pakistan was sudden and dramatic. The Third Five Year Plan, 1965-70, had already offered even more attractive incentives to private investment. Not only were sizeable subsidies on chemical fertilizer (35 percent) and pesticides (75 percent) maintained, but Government set the support price for wheat at Rs. 17 per maund, a rate fully 50 percent above the international price. Still, it was not until the advent of the dwarf varieties of Mexican wheat in 1967-68 that the wheat farmers were irresistably attracted to modernization. The net gains to cultivators of shifting from traditional techniques to the package of high-yielding varieties, fertilizer and other modern inputs was more than four to one: from $13 to $54 per acre.[49]

Striking increases on virtually all indices of agricultural development occurred within a few years. The number of private tubewells climbed from 32,000 in mid-1965 to 81,000 in mid-1970. Altogether, the total irrigated acreage under wheat expanded by 29 percent, from 8.6 million acres in 1964-65 to 11.1 million acres in 1968-69. Within three years, from 1967-68 to 1969-70, the use of Mexipak varieties was extended to 6 million acres, more than one-half the irrigated wheat acreage. Fertilizer application on the high-yielding varieties alone increased by more than three times between 1965-66 and 1968-69. By 1969, the number of privately owned tractors in West Pakistan exceeded 16,000. Finally, total production spurted from 4.3 million tons in 1967-68 to an estimated 7,000,000 tons in 1969-70. Indeed, in that year, West Pakistan "exported" a surplus of 155,000 tons to the East Wing. A final measure of the rapid transformation of the agricultural economy from one based mainly on production for consumption and exchange to production for the market is the sharp increase in the marketed surplus. In just three years, from 1966-67 to 1968-69, arrival of wheat in the markets of 21 principal wheat districts jumped from 7 percent to 28 percent of the total crop.[50]

It is reasonable to assume that rapid agricultural modernization in Pakistani Punjab affected the distribution of income between large and small landowners in a similar manner as in neighboring India. If anything, economic disparities must be more pronounced. Pakistani Punjab started with much greater inequalities in the distribution of land ownership. It also demonstrated a much deeper ideological commitment to private enterprise as the engine of growth both in industry and agriculture. Thus, for example, the Agricultural Development Bank, in sharp contrast to the Land Mortgage Banks in India, insisted on a minimum requirement of owned acreage of 12 1/2 to 25 acres (depending on the quality of land) in establishing eligibility criteria for tubewell loans. The almost total exclusion of the large majority of cultivators from the benefits of the green revolution is illustrated by the following data collected by Javed Burki for 27 villages in Pakistani Punjab in 1970. These figures show a strong positive correlation between percentage of irrigated land and rate of growth in crop production only in villages where large holdings of 50 to 100 acres are common. By contrast, in villages of predominately small-size farms, the percentage of irrigated area and the rate of growth show a significant negative correlation.

Table 3

Correlation Coefficients of Land-Distribution, Irrigation and Increments in Agricultural Output in Selected Villages in Punjab, West Pakistan

(n=27)

	0-10 acres	10-25 acres	25-50 acres	50-100 acres	100-250 acres	250 acres and above
Percentage of irrigated area	-0.53046	-0.17499	-0.07105	0.77643	-0.22063	0.08597
Rate of Growth in Crop Production Per annum	-0.69669	-0.16552	0.18257	0.77016	-0.00155	0.20361

The impact of these changes on traditional norms of mutual, non-symmetric obligations between landowners and agricultural laborers amounts to virtual dissolution of customary ties. Laborers are reported to fare much worse in the Pakistani part of Punjab than in India. At least some landowners, strengthened by official government ideology, have entirely abrogated the old system of proportionate payment in kind. They have converted the traditional payment of 1/20 of crop share for harvesting into an absolute quantity (about 164 pounds per acre) and now pay this fixed rate to agricultural laborers, denying them any share at all in the gains of the new productivity.[51]

The effect on relationships between landlords and tenants can only be indirectly inferred. In five sample villages, Burki found a suggestive pattern of rising rates of out-migration among males in the years between 1959 and 1969. The data is presented in Table 4 below.

Table 4

Out-Migration of Males, 1959-69

Year	251 Chak (Jhang District)	Khadd (Multan District)	Nankpur (Lyallpur District)	119/7/DR Chak (Sahiwal District)	Azam Hans (Multan District)
1959-60	17	32	56	42	22
1960-61	12	33	57	23	18
1961-62	20	27	39	58	30
1962-63	14	48	49	54	23
1963-64	19	51	48	55	42
1964-65	4	54	52	58	50
1965-66	20	62	80	49	54
1966-67	21	70	64	78	56
1967-68	25	81	95	99	58
1968-69	32	87	99	107	55
TOTAL	184	545	639	623	408

Most of the migrants in areas of rapidly rising productivity, moreover, are landowners. Relying again on Javed Burki's data from 27 Punjabi villages, the following correlation coefficients appear.

Table 5

Correlation Coefficients of Increments in Agricultrual Output (%), Annual Out-Migration (%) and Share of Landowners Among Out-Migrants (%) in Selected Punjabi Villages

(n=27)

	Rate of Growth in Crop Production Per Annum (1969)	Annual Out-Migration 1959-69	Share of Landowners Among Out-Migrants, 1959-69
Rate of Growth in Crop Production Per Annum (1969)	1.00000	0.78625	0.70774
Annual Out-Migration (1959-69)	0.78625	1.00000	0.56721
Share of Landowners among Out-Migrants (1959-69)	0.70774	0.56721	1.00000

Presumably, many of these are small landholders who previously relied on customary arrangements for leasing in land from large landowners in order to piece together a subsistence holding, but who have now lost hope that the latter will continue to honor their obligations under the traditional land tenure system, and forego the profits available from direct cultivation with modern technology.

The political implications of rapid modernization and growing disparities were spotlighted by the events surrounding the collapse of President Ayub Khan's political system in 1969. Students and lawyers spearheaded the growing civil unrest that originated in the small towns of West Pakistan in 1967, but popular animosity against the regime went beyond the frustrations of the urban, educated unemployed. The agitations against the government appeared to have the tacit, if not active, commitment of the "rural marginals" of West Pakistan, the landless and small peasant proprietors who had been by-passed in the gains of rapid economic growth under private enterprise policies.[52] The apprehension of popular violence was so high that by March 1969, President Ayub Khan saw no other alternative than stepping down from office and transfering power to a new Martial Law Administration. From the outset, the new President, General Agha Muhammad Yahya Khan, assumed his responsibilities with the firm intention of creating conditions favorable to the establishment of constitutional government. In November, 1969, Yahya announced that direct elections for a National Assembly would be held within a year. By January, 1970, public political activity was in full swing.

Despite expectations that the political contest in West Pakistan would be dominated by "Old Guard" landed interests, an entirely new political force soon emerged as a threat to the established order. In Punjab, of the 16 political parties officially taking part in the election, 15 were either in existence or were successors to parties and factions in existence before 1958. Of these, the major parties in Punjab were either factions of the original Muslim League, headed by the founder of Pakistan, Mohammed Ali Jinnah; or "Islam-Pasand" parties, dedicated to a religious-oriented society organized on Islamic principles. All of them represented the interests of upper middle class urban professionals, and/or the large landed families of West Pakistan. The new major party to appear, however, was styled the Peoples Party of Pakistan (PPP); initially, supporters came from student groups and urban intellectuals. As the campaign wore on, the small

landowners in the rural areas were increasingly attracted.

The PPP was a new phenomenon in the politics of West Pakistan for several reasons. First, not since the days immediately after Independence had a political party been led by a figure with a strong personal, almost charismatic, appeal. Zulfikar Ali Bhutto, the founder of the PPP, had earned his first public support in professional circles in West Pakistan; his firm anti-India position during and after the 1965 war appealed to West Pakistanis who were convinced that President Ayub Khan was too soft during the Tashkent negotiations. Then, Bhutto's resignation from the Ayub Government, his decision to go into active opposition, his arrest, release, and survival of an assassination attempt, built him into something of a folk-hero.

Second, Bhutto ignored the "Old Guard" politicians to put together a slate of candidates, of which the overwhelming majority had "hardly any political past" and were unknown to the electorate.

Third, in a campaign that emphasized direct electioneering, Bhutto made a clear class appeal. Stressing that political freedom was meaningless without economic freedom, Bhutto told peasant audiences throughout West Pakistan that he would establish a new social order free from exploitation. Typical of this rhetoric was a speech to a Multan gathering, where he noted a "tremendous awakening among the people who were now determined to end capitalism and feudalism," and asserted dramatically, "the hour of the poor masses has struck. People will become masters of their own destiny."[53] In a similar vein, Bhutto told a public meeting in Jacobabad that the PPP's program of Islamic Socialism "would bring prosperity to the toiling masses, danger to millionaires, thieves, zamindars (large landowners) and blood-suckers of the poor people."[54]

The results of the election clearly established that Bhutto had been correct in gauging the common mood. In the Punjab, the PPP won a landslide victory, capturing 62 of 82 seats, about 75%. By contrast, the various factions of the Muslim League won only nine seats between them; the Islam Pasand parties did worse, winning only five seats.[55]

A comparison between the five Districts where 50 percent or more of the total wheat acreage was covered under the Mexican varieties by 1968-69--Sarghoda, Lyallpur, Sheikhupura, Sahiwal and Multan--with the rest of the Punjab offer the following contrasts. In the Districts at the heart of the green revolution, the PPP contested in all 34 electoral constituencies. It won 30 seats and lost four. In the remaining Districts, the PPP contested in 44 out of 48 constituencies and won in 32, losing 16. In some electoral constituencies, the total vote is not yet available. Therefore, only a partial comparison of popular support is possible. In the 29 constituencies in the green revolution Districts for which data is available, the PPP received 50.1 percent of total votes cast. Data from 40 of 48 constituencies in the rest of the State show the PPP polling 40 percent.

It is dangerous to make broad generalizations about the relationship between agricultural modernization and political change on the basis of voter realignments in only one election. Nevertheless, the case studies presented here gain some credibility as a mirror of emerging trends from the strong resemblances they reflect of the impact of modern technology on rural income distribution and traditional social norms in two countries of widely different ideologies, institutions and economic policies.

At least the following points seem clear. Adversary relations between large landowners and the landless based on new notions of opposing economic and class interest ~~is~~ are increasingly replacing traditional hierarchial arrangements rooted in norms of mutual interdependence and obligation. The multi-caste/class political faction led by traditional landowning patrons and constructed with support from families of low status landless groups is becoming more and more difficult to sustain as a viable political unit. The key to political success, for parties of all color, will inevitably lie in popular support from the disadvantaged sections of the rural population. If only for this reason, the green revolution is likely to see at least an escalation in radical rhetoric. It is difficult to predict the results of such unbridled--and at times--unprincipled appeals to the aspirations of the poor peasantry. If nothing more is intended that the short-term gains of election victories, then the consequences may well be disastrous. Once awakened, the mass of agriculturists and laborers will not continue passively to accept their fate. Without at least some sign of good faith on the part of the government, those leaders who have managed to exploit the discontents of the rural poor, may well find themselves overwhelmed by the forces they have helped to unleash.

The social changes spearheaded by the green revolution are indeed very profound. Equally complex responses are demanded. At present, however, politicians have done little more than take advantage of the power vacuum that is opening in the rural areas. They have done almost nothing to fill it.

Footnotes

1. India, Economic and Statistical Advisor, Ministry of Food and Agriculture, Growth Rates in Agriculture, 1949-50 to 1964-65 (New Delhi, 1966), 48

2. Ibid., 61

3. Cited in Wolf Ladejinsky, Punjab Field Trip, New Delhi, April, 1969, mimeo

4. India, The National Sample Survey, Eighth Round: July 1954-April 1955, Number 66, Report on Land Holdings (4), Rural Sector-States, (Delhi, 1962), 100; India, The National Sample Survey, Number 140, Tables With Notes on Some Aspects of Landholdings in Rural Areas (State and All-India Estimates), Seventeenth Round, September 1961-July 1962, Draft (Calcutta, 1966), 46

5. India, Planning Commission, Fourth Five Year Plan, 1969-74, 176

6. India, The National Sample Survey, Eighth Round: July 1954-April 1955, Number 66, Report on Land Holdings, 100

7. India, Ministry of Labor and Employment, Labor Bureau, Agricultural Labor in India, Report on the Second Enquiry, (Delhi, 1960), 53

8. See Baldev Raj Nayar, "Punjab" in Myron Weiner, ed. State Politics in India, (Princetor University Press, 1968), 458-85

9. AID/W, Outline for Country-Crop Papers: Country, India, Crop, Wheat. First Draft Copy, March 1969, m[illegible], 7

10. Ibid., 44

11. State of Punjab, 1969, unpublished data

12. Ibid.

13. Martin E. Abel, Differential Rates of Growth in Rural Incomes Resulting From Specific Government Policies Like The New Agricultural Strategy, Paper presented at the Seminar on Income Distribution in India, New Delhi, February 1971, Attached Tables

14. Ibid., India, Directorate of Economics and Statistics, Ministry of Food, Agriculture, Community Development and Cooperation, Area, Production and Yield of Principal Crops in India, 1949-50 to 1967-68 (New Delhi, 1968), 47

15. India, Directorate of Economics and Statistics, Ministry of Food, Agriculture, Community Development and Cooperation, Indian Agriculture in Brief, Ninth Edition (Delhi, 1969), 90; Fourth Five Year Plan, 153

16. State of Punjab, 1969, unpublished data

17. K.S. Mann, An Analysis of Expected Shifts in Cropping Pattern of the Punjab (India) Resulting from the Introduction of High-Yielding Varieties of Crops (Ludhiana, Punjab Agricultural University, 1967), 16; State of Punjab, 1969, unpublished data

18. According to the Report on the Analysis of Crop Cutting Experiments, I.A.D.P., Ludhiana, average yields of Mexican wheat were only 3,628 pounds per acre or approximately 16 quintals in 1967-68, 3. During 1968-69, it is estimated that this declined further to an average of 3,280 pounds per acre or about 14 quintals

19. K.S. Mann, An Analysis of the Expected Shifts in Cropping Patterns of the Punjab (India) Resulting from the Introduction of High-Yielding Varieties of Crops, 16-17

20. Wolf Ladejinsky. Punjab Field Trip. My own interviews with tenant-cultivators in Ludhiana District in April, 1969 show the same pattern

21. Pranab Bardhan, "'Green Revolution' and Agricultural Laborers", Economic and Political Weekly, Special Number, July 1970. In April, 1969 agricultural laborers in Ludhiana District, an area of relative labor shortage, reported rates for casual labor of Rs. 6 per day. During the peak harvest season, when workers were most scarce, wages as high as Rs. 8 or Rs. 10 per day plus food were common

22. Ibid., 1240

23. The gains to agricultural laborers under the new formula are computed in the following way. Using local varieties, there are normally 80 bundles to one acre. Under the old system of division, 4 bundles, i.e., 1/20, averaging about 16 kilos each was paid to each team (of three or four men) for harvesting. Using the high-yielding varieties, there are now some 120 bundles in an acre. At the new rate of 1/30, four bundles are still paid as wages, but each now weighs 20 kilos to 25 kilos depending on the condition of the crop. The net gain to the laborers is about 25 percent in real income

24. R. Chandidas, Leon Clark, Richard Fontera, Ward Morehouse, ed., India Votes (New York: Humanities Press), 1968, Table II-5, Legislative Assemblies "Party Preferences"

25. In an interview in Chandigarh in April 1969, a leading member of the United Punjab Janta Party, (the group of dissident legislators who defected from the United Front Government and ruled as a minority government with Congress support until the declaration of President's Rule in November, 1968), ascribed the major motivation behind this defection to concern over subversive activities by Marxist members of the coalition. The Marxists were accused of using their official position to penetrate government security networks, encourage strikes by urban factory workers, and most alarming to the large landowners who provided the leadership of the Janta Party, develop a network of political cells reaching into the villages.

26. The Statesman, August 11, 1970. The police identified Naxalite cells in Ludhiana, Jullundur, Hoshiarpur, Rupar and Sangrur

27. The Statesman, March 20, 1971; March 25, 1971

28. The Statesman, November 12, 1969

29. West Pakistan, Report of the Land Reforms Commission for West Pakistan, January 1959 (Lahore 1959), 66

30. Ibid., 7. Government of Pakistan, Ministry of Labour, Report by Sir Malcolm Darling, I. L. O. Expert on Labor Conditions in Agriculture in Pakistan (Karachi, 1954), 32

31. Ibid., 12-32

32. Government of Pakistan, National Planning Board, The First Five Year Plan, 1955-60 (Karachi 1957), 216

33. Ibid., 221

34. Ibid., 227

35. Government of Pakistan, 1969, unpublished data

36. Government of Pakistan, Planning Commission, The Second Five Year Plan, 1960-65 (Karachi 1960), 132

37. Gustav F. Papanek, Pakistan's Development: Social Goals and Private Incentives (Harvard University Press, 1967), 146

38. Report of the Land Reforms Commission for West Pakistan, 66

39. Walter P. Falcon and Carl H. Gotsch, "Lessons in Agricultural Development-Pakistan" in Gustav F. Papanek, ed. Development Policy-Theory and Practice (Harvard University Press, 1968), 272

40. Ibid., 272

41. Government of Pakistan Planning Commission, The Third Five Year Plan, 1965-70. (Karachi, 1967), 393

42. Walter P. Falcon and Carl H. Gotsch, "Lessons in Agricultural Development-Pakistan", 274

43. Ibid. 278, 282

44. Gustav F. Papanek, Pakistan's Development: Social Goals and Private Incentives, 169

45. Talukder Maniruzzaman, "Group Interests in Pakistan Politics, 1947-1958", Pacific Affairs, Spring-Summer 1966, 85

46. Karl von Vorys, "The Value Structures of Legislators in Underdeveloped Countries", PROD, III, November 1959, 24

47. Mushtaq Ahmad, Government and Politics in Pakistan, Second Edition, (Karachi, Pakistan Publishing House 1963), 273

48. Karl von Vorys, Political Development in Pakistan, (Princeton University Press, 1965), 277-90

49. Lester R. Brown, Seeds of Change: The Green Revolution and Development in the 1970's (Praeger, 1970), 41

50. Government of Pakistan, unpublished data.

51. Richard Critchfield, "Sketches of the Green Revolution", The Alicia Patterson Fund, January, 1970, mimeo

52. Shahid Javed Burki, Ayub's Fall: An Explanation, Center for International Affairs, Harvard University, mimeo, 11

53. Dawn, December 6, 1970

54. Dawn, December 4, 1970

55. The PPP was also successful in Sind, where it won 18 out of 27 seats or over 66 percent of the total. Bhutto's greatest majorities came in the Larkhana area, and in the region around Hyderabad. Larkhana is Bhutto's home territory, and this probably explains at least part of his strong showing there. The Hyderabad area, where anxiety about an Indian attack is aggravated by the shared border, may have responded to Bhutto's nationalist image. However, it is also significant, given the hypotheses advanced in this paper, that the areas of Bhutto's greatest strength in this region coincide with a "green revolution" in rice since 1967-68 that is every bit as spectacular as the wheat revolution in the Punjab.