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RURAL DEVELOPMENT AND FERTILITY TRANSITION IN
SOUTH ASIA: THE CASE FOR A BROAD-BASED STRATEGY

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Rural Development and Fertility Transition
in South Asia: The Case for a Broad-based Strategy

Demographers working in the 1930s and 1940s established a tentative linkage between a sustained decline in fertility rates and structural changes in economy and society such as those that occurred in Western Europe and North America. Notestein, for example, attributes adjustments in fertility behavior to the spread of education, increased female labor force participation, and other changes that accompany industrialization and the urbanization of populations.¹ This theory of demographic transition is incorporated to a large extent in the generalized two-sector model of accumulation and economic transformation that emerged in the 1950s as a standard framework for development discussions. In the dual economy models of Lewis and others, the industrial sector, not "tradition bound" agriculture, is the critical arena of developmental change.² Industry serves as an "engine of growth" that carries development along by creating opportunities for innovation, savings and reinvestment, and labor absorption and by providing important "spread effects" of modernization such as demographic transition. Interest in agriculture is limited, in this approach, to its role in contributing "men and nourishment to the burgeoning industrial society."³ Major investments and reorganization in agriculture are ruled out--in part, because of fears of stimulating further population growth--until urbanization and structural change in the labor force are well advanced.⁴

In recent years, the consensus regarding development strategy and outcomes has changed in striking ways.⁵ Industrial expansion is now judged to

offer limited opportunities for output and export growth, employment creation, and social modernization in the early phases of development. On the other hand, agriculture is no longer seen as stagnant and unresponsive to policy initiatives. First, sustained increases in agricultural output and employment are thought to be within reach in South Asian countries such as Pakistan, India, and Bangladesh once the innovations known as the "green revolution" are introduced and managed under appropriate public policy.⁶ Debate continues over the costs and the income and employment benefits of alternative approaches to agricultural transformation. Second, concern that population growth would offset gains in production and employment has given way to the view that development can provide conditions favorable to fertility decline in rural settings.⁷

The production, employment, and demographic advantages of agricultural development are argued by Johnston and Kilby, Mellor, and others.⁸ Johnston and Kilby present the case for the adoption in South Asia of a "broad-based," employment- and equity-oriented strategy of rural development. In their view, a "unimodal" strategy directed at small farmers, such as that pursued in Japan, promises significant output and employment gains and demographic benefits in the form of an early downturn in rural fertility.⁹

The "Japanese" model of broad-based development and fertility transition serves, in the present essay, as a point of departure for a discussion of agricultural strategy and demographic change in South Asia. The unimodal strategy is introduced in the section that follows. I then review particular features of the broad-based model. First, the linkage between rural development and fertility decline—a rising aspirations hypothesis—provided

in the broad-based approach is explored and found wanting even as a description of what transpired in Japan. I discuss an alternative approach to fertility behavior phrased in terms of children's contribution to household security in settings where traditional rights and guarantees of subsistence are no longer in force. Second, I focus on differences in circumstances between developing Japan and South Asia, differences that rule out any close application of a Japanese strategy in the agricultural sector. In the distinctive conditions of South Asia, the goals of growth and mass participation in development, if they are to be attained at all, are likely to be realized through public interventions far in excess of those introduced in Japan. Government capacities are not unlimited, however. In a concluding section, I comment on alternative "second best" approaches to broad-based development.

I. The Broad-based Strategy

An immediate objective in the design of a green revolution strategy is to assure that improved varieties of food grains and the rest of the package of inputs and agricultural practices are adopted rapidly and used intensively. What is distinctive in the analysis of Johnston and Kilby is that the choice of an agricultural development strategy is seen in terms of long run consequences for output and employment growth and for demographic stability.

The use of high yielding varieties (HYVs) of wheat, rice, and other food grains in South Asia dates from the mid-1960s.¹⁰ HYVs have higher yield potentials than unimproved varieties. In addition, the new seeds have shorter growing cycles and promise greater output through increased multicropping.

Multi-cropping, intensive cultural practices, larger harvests, and expanded processing translate in turn into increased labor needs—another desirable outcome of the new agricultural technology.¹¹

Early successes with improved varieties had an exhilarating effect in the development community. The green revolution was seen as a godsend, "an unparalleled opportunity to break the chains of rural poverty."¹² The "miracle" new varieties were expected to lead to self-sufficiency in food production in South Asia, and to an era of surplus and food exports. Many observers felt that the "agricultural revolution" had averted a Malthusian population disaster, had "bought time," and had provided a "breathing space" in which to press on with development and to slow population growth.

The new varieties have performed much as promised in selected areas of Pakistan, India, Nepal, Bangladesh, and elsewhere, and continuing production flows from such areas have helped to stabilize food output at higher aggregate levels.¹³ At the same time, adoption rates and efficiency of use of improved varieties have been lower than expected. No overall breakthrough has been recorded in yields and no surge in agricultural employment has been in evidence.¹⁴ In aggregate terms, increases in population and labor force, largely uninhibited by family planning programs, have kept pace with trends in food production and labor demand.¹⁵

Many obstacles to rapid diffusion and intensive use arise out of characteristics of the new agricultural technology itself. The transfer of HYVs across agro-climatic zones may be delayed by the need to complete adaptive research and trials in new settings.¹⁶ But even where new varieties are well adjusted they remain sensitive to levels and timing of fertilizer appli-

cations, susceptible to pests and diseases, and easily damaged where water supplies and drainage are not carefully controlled. Yields may suffer drastically unless the new seeds are introduced as part of a package of inputs—fertilizer, pesticides, water—and new agricultural practices.¹⁷ More extensive use of new varieties depends, among other things, on the scope of policies to expand supplies of fertilizer, to increase acreage under controlled irrigation, and to develop hardier plant species.¹⁸

However, beyond assuring supplies of key inputs, public interest in the spread of the new technology extends to influencing intensity and efficiency in use and mediating the consequences of adopting new methods. It is the owners of medium to large size farms who have the capital to finance purchase of inputs and to invest in tubewells, minor irrigation structures, and farm equipment. Owners of larger farms have the skills to use new inputs and to apply the package of new and sophisticated practices.¹⁹ Adoption and use of HYVs by small owners and tenants depend on the availability of credit and support services.²⁰ Small holder adoption rates lag behind larger farms; adopting small enterprises incur higher costs per unit of output of HYVs and yield less in surplus. Finally, the new agricultural technology increases labor needs and should increase wages and employment opportunities for the landless.²¹ Wage and employment gains may be offset, however, by high rates of natural increase among small holders and the landless, by the introduction of labor saving techniques, and by the entry to the labor force of family members from smaller farms.

The broad-based strategy of Johnston and Kilby envisages an effort to deal simultaneously with limited growth of agricultural incomes and employ-

ment, slow diffusion and uneven impact of the new technology, and rapid increase in population and labor force. Policies are drawn from the experience of rural development and fertility transition in Japan. The green revolution that began in the late nineteenth century in Japan was carried through in a small farm setting.²² Important contributions of the Japanese government included the reforms of the Meiji restoration, which swept away feudal restrictions and strengthened the market framework.²³ A national system of transportation and communication was established, and measures were pursued to increase agricultural productivity. These involved substitution of a fixed cash assessment per unit of land for the Tokugawa crop sharing tax, establishment of an "itinerant instruction" system and experimental farms, support for landowners who undertook improvements, legislative and administrative steps to insure spread of best-practice traditional technology and new varieties and methods, and investment in a national scheme of primary education.

Along the lines of a Japanese model, Johnston and Kilby favor a coordinated effort in India, Pakistan, and other densely populated countries to assure adoption and intensive exploitation of the new technology in a sector of small scale farmers.²⁴ Special emphasis in such a strategy is given to the development of a research program oriented to small holders, investments to increase acreage under controlled irrigation and supplies of fertilizer, and expansion of rural education, credit, and extension type activities. Johnston and Kilby also stress the importance of correcting factor price distortions and, more generally, of using taxes and subsidies, land ceiling legislation, control of the exchange rate, and other instruments to create a hospitable environment for small scale agriculture.

This small farmer strategy is seen as conferring numerous advantages.²⁵ First, a small farm sector can become technologically progressive and efficient by virtue of the divisibility of inputs and the neutrality to scale of techniques. The experience of Japan demonstrates that small holders can achieve sustained increases in yield, output, and marketed surplus. Second, growth in a system of small scale holdings is expected to economize scarce entrepreneurial, capital, and foreign exchange resources. Japan again serves as an example. The broad-based strategy relies on relatively abundant farm supplied resources, especially labor, and permits agriculture to function as a "self-employment" sector. Third, small holder demand for inputs and consumer goods can provide a stimulus to domestic manufacturing industry, sometimes located, as in Japan, in rural areas.

Finally, of special interest for this paper is the view that broad-based participation of the population in income earning activities has favorable consequences for attitudes, incentives, and motivations relating to demographic behavior.²⁶ Here, the experiences of rural fertility decline in Japan, Taiwan, and Korea are cited as evidence of a linkage between uniform increases in income and modernization of attitudes and practices with respect to control of fertility.

II. Fertility Implications of Broad-based Strategies

In the broad-based model, fertility decline is anticipated as the mass of small holders experience improvements in living conditions. Fertility transition may be a consequence of health, education, and family planning services provided as part of government efforts to promote broad-based development.²⁷ But for Johnston and Kilby the critical mechanism leading to fertility decline

is a threshold or standard of living effect.²⁸ That is, as incomes rise fundamental changes occur in rural attitudes and motivations, including the appearance of new wants, new tastes for modern consumption goods, which make parents more receptive to the practice of family planning. Mueller provides an influential statement of the "aspirations hypothesis" in her studies of fertility change in Japan and Taiwan.²⁹ Mueller suggests that rising family incomes and the mass transformation of household preferences translate into "a desire for more educated children who will be able to leave farming for urban occupations, a felt need for farm equipment and other modern inputs, and a felt need for the savings necessary to achieve these goals."³⁰ Most critically, however, rising aspirations involve the "desire to participate in modern forms of consumption" that "intensify the felt economic burden of bringing up children."³¹

The aspirations hypothesis is of interest as an account of demographic transition in Japan and as a proposition of general significance. This hypothesis is one of a family of microeconomic models in which changes in household tastes and aspirations are given prominence alongside changes in income and price variables.³² Household tastes are not arrived at randomly. In such models, preference formation occurs in a social interaction framework, and the possibility is held out of systematic changes in norms and aspirations in the course of the development process.

What remains at issue is whether the emphasis in the aspirations hypothesis on mass changes in consumption preferences is justified empirically and helpful in anticipating fertility trends in late-developing countries. In fact, a review of the experience of Japan as well as considerations emerging from work in economic demography suggests it may be misleading to focus on

changes in tastes and consumption aspirations while ignoring other development variables and processes bearing on fertility.

In the case of Japan, a recent study reports fertility rising to moderately high levels in the 1875-1919 period, beginning a gradual decline in the interwar years, and falling drastically after 1950.³³ The relatively low fertility rates that apparently prevailed in the Tokugawa period are attributed by Hanley and Yamamura³⁴ to a conscious striving by farming families to strike a balance between the contributions of children to family income and security and the threat that children (sons) posed as heirs to the integrity of the family holding. The upturn in fertility occurred during the Meiji period, when agricultural intensification and commercialization placed additional demands on the labor time of family members. Rural Japanese fertility began to edge downwards in the 1920s, a period of economic adversity, rural-urban migration, and agrarian unrest. However, a sustained fall in rural fertility was delayed until the enactment of a major land reform, a revamping of educational policies and institutions, and changes in legal codes in the late 1940s.

The Japanese land reform produced a more equal distribution of assets. It is not implausible that subsequent income increases in a more egalitarian rural setting gave rise to new consumption standards and aspirations and heightened awareness of the burden of raising a large family. Yet a number of commentators have suggested that the recent decline in fertility is consistent with the "calculus of poverty" that has always operated in Japanese farming households.³⁵ The fundamental changes that occurred were in the productive contribution of children and in their value as long term "security assets." For example, Dore³⁶ and Mosk³⁷ suggest that the educational reforms—compul-

sory schooling was extended to age 15--worked to limit participation of children in household economic activities. The strengthening of agricultural cooperatives that accompanied land reform must have helped households adjust to lower levels of labor availability. Land reforms also added to the security of farm families by ending competition for leases and eliminating exorbitant rents and other abuses of the landlord system. And by improving household security and economic viability, land reform may have lessened the need for larger families as forms of insurance against disaster and old age. In this connection, Dore has shown how new inheritance codes and land reform strictures against transfer of landed property enhanced the status of first born sons. Younger sons were left with little hope of acquiring a portion of land and marrying and with little choice but to seek employment in urban areas.³⁸

Similar factors and processes seem to have been at work in Taiwan, where land reform and accompanying changes in agricultural organization detracted from the utility of children as productive agents and as forms of security and prepared the way for changes in patterns of consumption and family formation. The critical link, then, between agricultural development and fertility decline in Japan and Taiwan very likely came in the impact of agricultural reorganization on the "employability" of children and their value as forms of security. Likewise, in South Asia the potential importance of these "linkage" variables and fertility determinants is demonstrated in a number of recent studies.

Of interest first are the efforts of Cain³⁹ and White⁴⁰ to determine the productive contribution of children in rural settings in South Asia. Cain provides estimates of the amount of time spent in various productive activi-

ties by children of different ages in a village in Bangladesh. He finds that children begin work as early as age six and become net producers between ages 10 and 13. Cain's conclusion is that high fertility is economically rational in terms of the labor contributed by children. Fertility decline, in the perspective of this time-budget analysis, is not expected until developmental changes in the organization of work, within households and the community, and in the availability of labor saving devices reduce dependence on the labor of family members.

Also of note is research that explores the contribution of children as forms of security or insurance. Leibenstein developed the notion of children as a source of old age security.⁴¹ Cain has shown the importance of sons as a form of insurance against catastrophes such as the premature death of the head of household.⁴² In an important extension of the "security assets" approach, Ben-Porath⁴³ and Blandy and Woodfield⁴⁴ have investigated characteristics of children as sources of security and identified settings in which children are preferred over other assets or forms of investments.

Children have distinct attributes as assets and security guarantees.⁴⁵ First, they are "inflation proof" and thus are desirable investments in times of rapid and irregular inflation. Second, in-house socialization, training, and education, and parental control of property, age of marriage, and job allocation and status are ways of increasing the probability that children will yield expected benefits. Third, there may be substantial risks entailed in investing in individual children, especially in communities of high infant and child mortality. In such settings, what is indicated is greater diversification of the investment profile--higher birth rates and lower investment in each child. Fourth, there is the risk that surviving children

will fail to recognize obligations to parents. This may occur because of the limited extent of parental property, because of sibling rivalry over inheritance shares, or because of the opening up of earning opportunities beyond the reach of parental controls and sanctions.

In terms of these characteristics, the potential contribution of children as sources of old age and catastrophe insurance must be assessed in relation to other investment opportunities that may be available or alternative sources of security. Children may be valuable as assets even if they pay a low or negative rate of return. What is important is that children pay a higher or more certain return than other investment options or alternative sources of old age and disaster insurance. Capital markets are poorly developed or nonexistent in most developing countries, and there are few examples of private companies or public agencies coming forward with insurance policies or social security programs. On the other hand, a variety of extrafamilial networks and institutional arrangements have provided social insurance in agricultural settings. I have in mind patron-client ties and hereditary contracts binding families, kinship relationships, and other redistributive mechanisms, guarantees of subsistence, and forms of collective risk sharing.⁴⁶

In essence, a "security assets" approach suggests an evaluation of social organization, including markets, and the pattern of developmental change from the perspective of security guarantees offered and denied to individual households. In this view, current high fertility rates are a consequence of the breakdown of traditional means of assuring support to community members and the failure of new security opportunities to emerge. Shorn of other possibilities, small and marginal farmers and the landless have little choice but to rely on their children as sources of old age and disaster insurance.

But agricultural development provides opportunities for the emergence of new support arrangements, new forms of mutual aid and collective risk sharing. The demographic effects of broad-based development strategies may well depend on the sort of organizational forms and networks that are introduced into the local setting or spring up on their own.

The availability of a broad-based path

Broad-based strategies represent a distillation of the development experience of Japan linked, at least implicitly, to arguments for the relevance of that experience to present day concerns. A central lesson of the Japanese model is that diffusion of labor using technological innovations is possible and desirable in a small farm setting. However, the "transferability" of this lesson is in doubt, because the social framework of agriculture in South Asia differs in crucial respects from that in developing Japan.

First, Japan's Meiji regime inherited a relatively well developed irrigation and drainage system along with a tradition of experimentation and gradual improvement in agriculture.⁴⁷ A considerable expansion of irrigated agriculture had occurred under the Tokugawas (1603-1867). Improvements in the quality of irrigation and drainage facilities were undertaken in the Meiji period. But these investments were of the sort that could be organized and funded by local communities.⁴⁸ Japanese farmers were already productive and proficient in irrigated farming, seed selection, use of fertilizers, and other techniques at the time of the Meiji takeover.⁴⁹ With irrigation infrastructure largely in place and farmers knowledgeable in intensive cultivation, Meiji authorities could afford to be selective in their agricultural

policy. Government efforts concentrated on developing a research and extension system and investing in rural education.

In South Asia, the low level of development of irrigation facilities and the more limited practice of intensive agriculture constitute major barriers to the diffusion of the new agricultural technology.⁵⁰ Extension of the area under irrigation involves heavy investment costs and long gestation periods.⁵¹ Moreover, the expansion of irrigation capacity must inevitably divert funds from the production of other inputs, from the adaptive research needed to renew and improve varieties, and from efforts to improve skills and farming practices and to encourage adoption of the new technology.

Furthermore, the institutional framework of Japanese agriculture—what Hayami calls the organizational capacity of the rural population—was such as to facilitate the spread and intensive use of the new technology. In South Asia rural organizational capacity is deficient in many respects. Government strategies to foster diffusion and productive use of new varieties must go beyond research and extension activities to include restructuring institutions and incentives in the farm sector. Yet, there are decided limits on the capacity of government to shape events in rural areas in South Asia. In the following paragraphs, I comment further on differences in agricultural organization in developing Japan and South Asia.

Organizational capacity in developing Japan and South Asia

Agricultural organization and structure in Japan and South Asia had common elements and features as these areas were "opened up" to European influence.⁵² The rural population generally resided in villages that were relatively closed economic, social, and political units. Village lands were

controlled by a minority of households, while the contributions of services and distribution of products among propertied groups and tenants, permanent laborers, servants, artisans, and others were governed by a variety of arrangements and normative principles rather than "free" exchange in a market setting. Social relations were hierarchical, but inequality found some remedy in the paternalism and patronage of the wealthy. Thus, patron-client ties guaranteed even the poorest villagers a share of community output.

The subsequent evolution of rural social organization in Japan is well documented. The village social system was subjected to shocks and strains as feudal restrictions and supports were removed, cash levies were imposed in the Meiji land settlement, and the pace of agricultural improvement accelerated in response to market opportunities. What is noteworthy is that innovation and intensification of production occurred without engendering or requiring major changes in rural social organization.

A key role in the growth of agricultural production in Japan seems to have been played by village landlords.⁵³ The Meiji land settlement enhanced the economic position, status, and influence of landlords over tenants and in the village as a whole. Landlords were generally literate and knowledgeable. They responded to new opportunities and used their moral authority and other pressures to induce tenants to adopt new methods and inputs and to initiate improvements in village infrastructure. Landlord efforts to encourage and sponsor minor irrigation works, consolidation of farm lands, land reclamation and the like were recognized in the Agricultural Land Adjustment Act of 1899.⁵⁴ The Land Adjustment Act gave landlords and the village community the right to require participation in irrigation and land improvement projects. The law provided a de facto tax reduction and low interest credit to

cover the costs of investments. Landlord contributions were also acknowledged in the support provided to local agricultural associations and cooperatives and in other public initiatives in rural areas.

The benefits of agricultural growth in Japan were distributed unevenly within the rural sector.⁵⁵ Cultivating households remained impoverished as productivity gains were to a large extent absorbed by increasing rents. The status of tenants became more precarious as a result of provisions introduced in the Meiji land settlement. Tenants remained dependent on landlords for extra work, credit, and other services while running the risk of eviction or unilateral reinterpretation of tenancy agreements. Nevertheless, social and economic cooperation among cultivating households and between cultivators and landowning families worked to keep competitive pressures within limits and to check arbitrary use of landlord powers. The village social system--characterized by Dore as "hamlet solidarity"--remained more or less intact. The poor retained ties to land and no sizable pool of landless laborers emerged in rural areas.⁵⁶

Social change in rural South Asia has taken a different course. Population growth rates have been more rapid than in Japan and population change a more potent force for reorganization.⁵⁷ The opening up of rural areas to commercial opportunities occurred under a British colonial regime. British rule provided law and order and a secure background for agriculture. New systems of land tenure were introduced together with a legal framework giving owners the right to sell or mortgage.⁵⁸ Cultivation expanded on previously unutilized lands. A characteristic of growth in this period was that yields failed to rise in a sustained fashion.⁵⁹ Only limited use was made of fertilizers and other intensive practices, and the few attempts of colonial autho-

rities to improve production techniques were largely unsuccessful. While the Japanese engineered major improvements in agricultural productivity within a traditional social setting, the British seemed to have disturbed the social framework of agriculture and left little impression on production technology.

In recent decades, the pace of rural change in South Asia has quickened. Commentators have found some features of the rural setting baffling and have had difficulty in characterizing agrarian structure and organizational capacity.⁶⁰ Many observers have opted, in fact, to describe rural society not in terms of essential aspects and system attributes, but as in a transitional state. Kingsley Davis writes of a "sort of progressive proletarianization of one whole society";⁶¹ for Scott⁶² and Frankel,⁶³ rural society is in a state of flux, with the village economy being weakened and cultivators exposed to market based insecurities, subsistence options narrowing and customary forms of reciprocity subject to erosion, and landlord-tenant ties losing their protective content and giving way to commercial bargaining principles. Movement is toward a new social structure, but the transformation is not yet complete. Similarly, Beteille⁶⁴ and Arthur and McNicoll⁶⁵ are aware of new modes of organization in agriculture, but report an impression of "amorphousness" and "diffuseness."

New findings and conceptual advances, however, allow the contours and characteristic features of the rural sector in South Asia to emerge more clearly. Thus, a classification of the population by amount of land cultivated and principal source of household income permits interest groups and strata and relationships between groups to be delineated. In overall terms, social organization appears to differ radically from that in developing Japan. The emergence of cultivating large farmers, a diverse group of small

holders, and large numbers of landless wage laborers must be counted as major obstacles to any broad-based strategy.

Enterprising capitalist farmers

As in Japan, it is the owners of medium to large size holdings in South Asia who have taken the lead in introducing the new agricultural technology. But in contrast to the Japanese case, landowners, especially those operating consolidated holdings of 10 to 20 acres, have found it advantageous to farm their own lands and to increase scale and efficiency in operations by disposing tenants and buying or leasing land from small holders, undertaking improvements on their own properties, and moving to assure stable flows of critical inputs.⁶⁶

Larger farmers have been resourceful in making use of HYVs, hired labor, and other "nontraditional" inputs, and successful in managing the practices and operations associated with the seed-fertilizer technology.⁶⁷ Profit minded farmers have assumed production and marketing risks and have invested in minor irrigation works, tubewells and pump sets, storage facilities, and, in some areas, tractors, power sprayers, and other mechanical aids. These owners of larger holdings have shown significant yield increases and have proven to be more cost efficient than small farmers and more capable of generating an investable surplus.⁶⁸

Capitalist farmers are involved in farm management, in supervision of activities, and in phases of cultivation itself. The bulk of the labor force on these farm enterprises is made up of landless wage laborers. While more labor is being hired, larger farmers have moved to dismiss servants and family retainers, to evict tenants in some instances, and generally to reevaluate

relations with client groups.⁶⁹ There has been no wholesale repudiation of customary forms of reciprocity and obligation. Farmers have preferred to reinterpret such ties, to use social connections instrumentally to reinforce their market position, and to reduce uncertainty in regard to the availability of hired labor and the supply of produced inputs, credits, and water.

This concern to insure supplies of labor and other inputs arises out of the rigid scheduling of operations and rotations in the new agricultural technology. Thus, larger owners have sought to use their extraeconomic prerogatives and their oligopsony powers in local markets to insure availability of labor and other inputs.⁷⁰ For example, employers may offer long term contracts to laborers in the slack season in order to save on peak season recruitment costs.⁷¹ Employers may also attempt to stabilize supplies and to reduce labor costs by adjusting terms and contracts offered in land, credit, housing, and commodity markets. This "interlocking" of markets is often indistinguishable from a network of customary ties and obligations. But Bharadwaj,⁷² Bardhan,⁷³ and others have argued persuasively that such arrangements represent institutional adaptations to accommodate employers' needs for dependable labor supplies.

Landowner domination of a set of interconnected markets has other consequences as well. "Interlinking" of markets increases the ability of large holders to evade legal controls on interest rates, rents, or crop shares.⁷⁴ Market power exercised through such personalized relationships also permits wealthier farmers to dominate agricultural cooperatives, to enjoy special access to government services, and to dilute the effect of government programs aimed at the rural poor.⁷⁵

Small holders: owners and tenants

This category encompasses the high proportion of rural households with operational units of five acres or less, but excludes those households in which wage earnings are a primary source of family income. There is much diversity within this group. Small holdings include some units that have made the difficult adjustment to the new technology; these farm enterprises could become commercially successful if their land and credit resources were augmented. By and large, small farms consist of "subsistence" units that have not participated to any great extent in the green revolution. These family labor operations yield little surplus product for investment and have only irregular or insignificant ties to input or output markets.

The slow response of small holders to new market and technological opportunities derives from characteristics and conditions that are mutually conditioning.⁷⁶ First, many small farmers lack the knowledge and skills needed to adopt the new technology successfully. Cultivation and management practices in the use of conventional agricultural technology are far from optimal,⁷⁷ while means have not been worked out for instructing the largely illiterate small holders in the use of new inputs and the completion of critical operations. Second, small farmers have an inferior resource base and have difficulty in gaining access to moderately priced credits. Small holdings are often dispersed in numerous plots, of lower natural fertility and poorly located with respect to irrigation facilities. Storage sheds, draft animals, and tools and implements are available in insufficient quantity. Small farmers lack the savings to undertake improvements and the cash to invest in required amounts of fertilizers, seeds, and other costly inputs and to hire labor at critical times. At the same time, the limited collateral of

small holders works against the chances of obtaining credits from institutional lenders.⁷⁸ All things considered, the inadequate knowledge of small farmers, their inability to acquire and apply inputs to the extent required, and uncertainty rooted in the technology and in the market environment combine to increase the subjective risks of adopting HYVs.

In developing Japan, the relationship between landlord and tenant proved to be a means of introducing new varieties and techniques and of increasing small holder yields. Landowners took on vital managerial and entrepreneurial tasks and provided technical advice, working capital, and investment funds to tenants and small owner cultivators. In South Asia, such a mechanism for the "percolation" of the new technology is absent. Ties between large and small farmer, landlord and tenant are complex, with small holders still dependent to some extent on large owners for credit and employment and obligated to provide services in recompense. But in regard to supplies of water, purchased inputs, cheap credit from public institutions, and critical labor inputs, large and small farm enterprises are engaged in persistent but unequal competition.⁷⁹ For example, labor markets work less effectively as an adjustment mechanism for small farmers than for financially solvent large farmers. Small holders who seek to hire supplementary labor at peak times may encounter shortages and skyrocketing wage demands. The same households may be unable to spare family members with obligations at home to compete for the limited number of long term labor contracts available on large units.⁸⁰ On the other hand, when small holders turn to large farmers for consumption credit or working capital needs, they may have to promise their own unpaid or underpaid services during critical periods to cover the debt. This forces small farmers to stint on labor inputs and to suffer lower yields on their own holdings.⁸¹

Small farmer options are highly circumscribed in the new commercial environment. Nonadopters must contend with all the risks of cultivating with traditional varieties, but without the protection once assured in ties to landlord and community. Adopting small owners may be driven into debt and bankruptcy by the costs of the new technology, while tenants may be threatened by rising rents and eviction.

Ultimately, small holders may find it opportune to sell or to lease out lands to large farmers and to enter the labor force on a full-time basis. Such a course may have already been marked out by family members--children or siblings who had been "targeted" for labor force participation. In this respect, children have an unrecognized but potentially significant insurance role to play in the uncertain market and institutional setting faced by small holders. Apart from their contribution as sources of old age and disaster insurance, children may represent valuable insurance against high transaction costs in labor, credit, or land markets or outright market failure. Especially where markets are fragmented, imperfect, or monopolized on a localized basis, children may provide the flexibility needed by poor households that seek to avoid dependence on uncertain markets for labor supplies at crucial moments and to free members for full-time participation in labor markets. In this view, "commercialization" may have made large families more attractive by linking household income security to a poorly functioning market system.⁸²

The absence of landlords and landowners with an interest in improving small holder productivity has profound implications for broad-based small farmer strategies. Only state agencies are capable of providing the protective framework and the extension and supervised credit services that would enable small farmers to increase their yields. However, there is great

uncertainty in regard to the range and intensity of state services and complementary policies that can be sustained as part of a small farmer strategy. Advocates of a broad-based approach in South Asia must address unsettling questions with respect to the role envisaged for larger farm units, the extent of the small and marginal farm sector to be accommodated in such a strategy, and the options reserved for landless farm laborers.

Landless agricultural laborers

Landless wage laborers, a group that scarcely existed in Japan, have emerged as a major element of social organization in South Asia.⁸³ Farm laborers include those hired for extensive periods as "attached" workers, as well as casual workers employed for a number of hours or days to undertake a specific task or activity.

Demand for hired agricultural laborers has been enhanced by the spread of HYVs.⁸⁴ Large farm enterprises depend on wage labor as status considerations limit the participation of family members.⁸⁵ Meanwhile, the volume of work created through improved practices, expanded multicropping, and larger harvests exceeds the capacity of most cultivating households. The scheduling of operations and the limited time available between crops force even small holders to hire labor in critical periods.⁸⁶ These factors leave employers, especially larger farmers, vulnerable to attempts to withhold labor and to bargain collectively. In some regions of India, agricultural labor unions have become involved in the wage determination process and have apparently achieved significant increases.⁸⁷

The wages and employment of agricultural laborers are limited or threatened by various factors. First, growth in numbers undermines the economic

position of wage laborers. Contributing to this growth are high rates of natural increase. Tenancy resumptions, bankruptcies, and forced sales by small owners and the labor force entry of one-time artisans and family servants also add to the pool of landless laborers.⁸⁸ Wages and employment are also affected by the mechanization of various agricultural operations. Tractors, of course, may increase labor demands when used to prepare lands for multi-cropping and to pump irrigation water. But when tractor use spreads to other operations the net effect is likely to be labor saving. Other mechanical devices such as threshers and reapers are strongly labor displacing.⁸⁹ Finally, oligopsony powers serve larger farmers as a means of moderating wage and employment gains.⁹⁰

The predicament of landless agricultural laborers is distinguishable from that of small holders. Average income in farm labor households is significantly below that in small farm households.⁹¹ Agricultural laborers are without livestock or implements and lack even the small plots that offer shelter and a semblance of security to small holders. Their low ranking in the status hierarchy interferes with efforts to improve their economic position. While their welfare remains linked to the intensity of production and labor needs on medium to large size farms, agricultural laborers are vulnerable to market oscillations and to periods of overwork followed by inactivity and unemployment.

Prospects for the landless in South Asia remain unclear. Small farmer strategies may offer some relief by slowing mechanization, making lands available for tenancy, and increasing off-farm demands for labor. However, the landless are so numerous and so poorly endowed as to require specialized programs and policies going beyond the conventional small farmer "package."

A small farmer strategy may work against the employment chances of the landless if tenants and small owners rely on family labor in intensifying production.⁹² What needs to be considered is the possibility of making the landless groups, as opposed to small farmers, the primary focus of government intervention efforts. The net social gains of a strategy oriented toward the employment and welfare of the landless may outweigh those arising out of a broad-based small farmer strategy.

III. Alternative Broad-based Development Strategies

The discussion in this paper of Johnston and Kilby's broad-based model has focused on historical lessons and empirical propositions that are misleading or inappropriate in the South Asian setting. Johnston and Kilby approach agricultural development as a problem of choice of strategy—a mix of policies, programs, and projects—to influence the rate and pattern of growth. Agricultural transformation is recognized to have multiple consequences; and growth, equity, and demographic stabilization are seen as critical development goals. The problem is to choose an "efficient" strategy in terms of such goals. Johnston and Kilby's discussion of development objectives and policies represents an interesting attempt to treat population and development variables and constraints in a single framework. Demographic change, in this model, is linked through explicit mechanisms to policy-induced changes in economic and social setting in rural areas.

One problem with Johnston and Kilby's approach is the emphasis given to consumption aspirations as a linkage between development and fertility decline. It is not implausible that growth in rural incomes would be accompanied by the acceptance of an image of the good life in which resources and

energies devoted to children are deemed less rewarding. But such a reevaluation of consumption standards has typically occurred long after the institutional structure of agriculture has been transformed. A more potent development effect on fertility may follow from changes affecting children's roles as producers and as insurance "policies" against various contingencies. Growth of income earning opportunities and institutional changes in developing agriculture impinge in various ways on household security. For example, public health measures and increases in real income tend to improve adult survival chances, making it less essential to rely on sons as a form of catastrophe insurance. On the other hand, reorganization in agriculture in response to market opportunities may enhance the value of children by undermining guarantees of support rooted in traditional institutions. In a "security assets" approach, the demographic impact of development policies and strategies derives from a reconstitution of institutions and organizational arrangements crucial to household security. In Japan, "hamlet solidarity" survived the stresses associated with agricultural growth; community ties, which were strengthened by the formation of tenants' unions and cooperatives, very likely contributed to fertility decline. In South Asia, village society has lost cohesion. Prospects for fertility decline are bound up with the creation of new supportive institutions and organizations of and for small holders and farm laborers.

The broad-based model also runs into difficulties in its presumption of similarity in conditions in developing Japan and present day South Asia. The density of settlement in developing Japan can be likened to that in the South Asian countries. But Meiji Japan was more favorably endowed in agricultural infrastructure, and farming practices, skills, and productivity levels were

superior in Japanese farming communities. Most critically, developing Japan had distinct advantages in organizational capacity. Innovation and productivity gains in the small farm sector took place under the sponsorship and direction of the landlord class. Leadership and entrepreneurship provided by village landlords permitted the Meiji government to limit its agricultural development initiatives to moderate investments in research, education, and extension activities.

In South Asia, organizational capacity is hampered by a divergency of interests within the rural sector. What stands out in the current setting is the vulnerability and insecurity of larger farmers, small holders, and landless wage laborers in the face of a complex and demanding new technology. Larger farmers have demonstrated initiative and expertise in adopting new varieties and in achieving higher yields. However, in contrast to the pattern of events in Meiji Japan, the innovative behavior of larger owners has not had a major impact on the yields and production levels of small farmers. The response of small holders can be linked to limited knowledge and experience and to a poor resource base. Small farmers are at a disadvantage in factor markets in which larger owners are able to influence the terms of trade. At the same time, small holders must continue to rely on larger farmers for credits, part-time employment, and marketing services. The fate of landless agricultural laborers, a group virtually unheard of in Japan, is closely tied to intensification of production on larger farms. In their dealings with large owner operators, agricultural laborers may use the threat of withholding labor to secure better terms of employment. Larger farmers have acted to neutralize labor's bargaining powers by exercising control over the terms of labor contracts and by mechanizing various agricultural operations.

In this South Asian setting, broad-based strategies must depart from the approach taken in Japan to include more extensive and costly public interventions. In fact, the package of policies recommended by Johnston and Kilby is far in excess of the measures and programs adopted in Japan in terms of the scope and depth of government involvement. The priorities listed by Johnston and Kilby include strengthening research activities, influencing the size distribution of farm units, expanding agricultural infrastructure, promoting diffusion of innovations and access to inputs, improving tax systems, and introducing assorted social welfare programs. But what is lacking in their discussion is a sense of the unprecedented responsibilities and burdens that await governments in pursuing rural development strategies and the need to arrive at feasible and sustainable approaches to broad-based development. The specific features of agriculture in South Asia--the limited availability of irrigation facilities, the absence of a tradition of landlord initiative and leadership, the presence of large numbers of landless farm laborers--are such as to necessitate a choice among models of rural reorganization that diverge from the Japanese pattern. Research is urgently needed, however, on the costs in financial and administrative terms and the likely production, employment, and demographic benefits of alternative "second best" strategies of broad-based development. I conclude this essay by discussing two strategies for broad-based development in South Asia that differ according to the focus of government policies.

An integrated rural development strategy

In the absence of a landlord class to force through improvements, extension of the green revolution to small holders depends on state provision of

organizational and technical services. In an integrated rural development strategy a coordinated approach is adopted to improve infrastructural facilities and to provide a package of credits, inputs, and extension services to small farmers.⁹³ In a "best case" scenario, the integrated strategy traces out a desirable development path. Small farmer productivity, output, and incomes increase through provision of inputs and information on new techniques. Small holders invest in improvements and begin to diversify into livestock, dairy, and vegetable production. Meanwhile, farmers benefit from the provision of community-based social services. The contribution of development agencies becomes less essential as local initiative and a feeling of community solidarity assert themselves. The new rural setting is organized around cooperatives through which households exchange labor, market in bulk, invest in machinery, and generally pool risks. Finally, high fertility is no longer essential and in fact has become a threat to household security. Cooperatives and more informal linkages between households introduce a sense of accountability and reduce the threat of negative spillovers from high fertility.⁹⁴

There are risks, however, that an integrated strategy will lose its way in the face of organizational problems and the realities of the rural social setting.⁹⁵ There is no standardized and proven administrative model that can be applied in such programs. Integrated projects rely heavily on extension agents in the performance of project tasks; however, the role allotted to such agents goes beyond the traditional function of introducing methods. Extension agents are expected to serve as intermediaries and ombudsmen, as organizers and managers of cooperative societies, as initiators and advisors

on technical and financial matters, and more generally as "social engineers" in localized project settings.⁹⁶

The recruitment and training of high quality extension officers is time consuming and expensive in terms of funds and personnel diverted from investment activities and special programs directed at farm laborers and other groups. It is questionable whether an army of inexperienced agents operating with untested procedures can succeed in establishing a viable community setting and in pushing the target group of small farmers up to some threshold level of income and efficiency. A major challenge for extension agents and for the entire project organization is to minimize "leakages" of benefits to larger farmers and to control corruption.⁹⁷ Large farmer influence and maneuverability are such that only a persistent, agent intensive effort is likely to achieve program objectives. A likely outcome therefore is for integrated programs to be scaled down in scope and aims so that relatively few areas are serviced or only a minority of small holders enjoy benefits.

A guaranteed employment strategy

An alternative to an integrated approach exists in the use of government financial and administrative resources to pursue public works projects and other policies that create employment for landless farm laborers--a guaranteed employment strategy. Agricultural laborers do not benefit directly from integrated credit and input programs, and their hopes for increased employment may be dashed if small holders rely primarily on family labor or introduce labor saving devices within a cooperative framework. It is also unlikely that a land reform component in an integrated strategy would aid landless farm laborers. Calculations by Minhas⁹⁸ and others suggest that imposition of

low ceilings on land holdings and distribution of surplus lands to the landless would only add to the large number of uneconomic holdings. Along with the heavy costs associated with reform itself, governments would also be faced with the task of supporting a great many small and marginal holdings.

In a guaranteed employment strategy, employment for wage laborers takes priority over land reform and over provision of credit, subsidized inputs, and extension and managerial services to small holders.⁹⁹ Government efforts extend first to creating a framework conducive to rapid growth in output and in demand for hired labor. Authorities are concerned with developing irrigation and marketing facilities and assuring availability of credit and inputs in the market place. Wage subsidies, excise taxes on labor saving equipment, and taxes on the potential productivity of land may be adopted to encourage farmers to intensify production and to hire more labor. Most critically, government agencies offer employment on a guaranteed basis in ongoing public works schemes. Such projects can be greatly expanded over present levels of activity, with an infusion of resources presently directed at small holders. Employment-creating projects can be linked to training and social services directed at farm labor groups and to efforts to organize wage laborers into bargaining units.

The guaranteed employment strategy aims for rapid diffusion of innovations and growth in output through infrastructural investments and intensification of production on medium to large size farms. Farm laborers, including many former small holders, should enjoy wage increases in a tightening labor market, along with employment and welfare gains due to the public commitment to provide work to all seekers. If income and employment benefits can be sustained, it is possible that demographic effects such as reduced family size

preferences and increased practice of birth control would follow. The linkage here would be improved individual and collective security among agricultural laborers as a result of employment guarantees, and, in the longer term, the organization of farm workers into bargaining units that prove successful in winning improvements in wages and living conditions.¹⁰⁰

Alongside these possible opportunities, the employment strategy imposes significant risks and costs. First, expectations that viable farm units will be able to increase productivity and labor intensity in response to market signals may not be borne out.¹⁰¹ Second, the organization of large scale, long term public works programs may come to rival integrated programs in administrative complexity. The Maharashtra Employment Guarantee Scheme has brought to light problems of managing and developing new works projects at the local level.¹⁰² Third, the guaranteed employment strategy may lead to increased social and political tension if farm labor organizations espouse revolutionary goals and/or are viewed as a threat to the interests of farm owners. Such an outcome may be avoided if agricultural laborers enjoy early and significant wage gains and can be persuaded to adopt a "reformist" perspective.

Notes

1. Notestein (1953).
2. In the models of Lewis (1958), Fei and Ranis (1964), and Murkse (1953), the agricultural sector is characterized by disguised unemployment—a situation of zero marginal productivity of labor—and a positive wage related to the average product of labor. This setting is favorable to the emergence of a capitalist industrial sector that can expand by drawing on the agricultural labor force and by paying the constant, institutionally determined wage rate.
3. Landes (1965, p. 171).
4. The agricultural sector in Lewis-type models is credited with a capacity to compensate for the loss of "redundant" labor. At the same time, investment opportunities in agriculture are regarded as unpromising. First, the sector is presented as inefficient, dependent on rudimentary techniques, and dominated by customary relations (see Leibenstein, 1957; Higgins, 1959). Doubts are expressed with respect to the readiness of cultivators to respond to market signals and to adopt new techniques. Schultz (1953) gives vent to such views in his urban-industrial impact thesis. He argues that policy measures will have greatest impact in agricultural areas that come into contact with dynamic urban-industrial centers (see also Leibenstein, 1957). Second, income gains are expected to be offset by increases in population size, a consequence of falling mortality rates and continuing high fertility in an unchanged social setting (Jorgenson, 1969; Leibenstein, 1957). Expansion efforts are fated to be self-limiting unless they are linked to a development program that removes surplus population and permits a restructuring of agricultural institutions. Third, the argument is made that food production is capital intensive relative to the production of a wide range of manufactured goods and thus is not suitable as an area of specialization (Baran, 1958; Flanders, 1969). A comparable position is taken by Hayami and Ruttan: "Maintenance of the rate of growth of agricultural productivity can be expected to impose a substantial drain on the savings which can be generated from the agricultural surpluses. Initially, a substantial component of industrial capacity must be designed to provide technical inputs for the agricultural sector. Substantial investment will be needed. . ." (1971, p. 101).
5. The reorientation of development doctrine is discussed in Emmerij and Ghai (1976), Healey (1972), Hayami and Ruttan (1971) and Bruton (1974). Expanded goals and increased involvement of governments and donor agencies in agricultural development are treated in Islam (1978), Asian Development Bank (1978) and Stryker (1979). In the case of India, the role and contributions expected of agriculture are spelled out, at length, in the Government of India (1976a).
6. The potential for providing productive employment in agriculture is investigated in Shaw (1970) and in the publications of the International Labor Office's Asian Regional Team for Employment Promotion, such as Ishikawa, 1978.

7. See Rich (1973) and Kocher (1973).
8. Johnston and Kilby (1974, 1975), Mellor (1976). Other pertinent works include Johnston (1966, 1969, 1970, 1972), Johnston and Cowie (1969), and Johnston and Mellor (1960).
9. The broad-based strategy of Johnston and Kilby, Mellor's "employment-oriented" strategy, and related approaches (see Hunter, Grant, and Rich, 1972; Myint, 1973; Ward, 1974) are seen as capturing the experience of Japan and Taiwan, or more generally, the East Asian experience. In the present paper, reference is for the most part to the Japanese experience, although it is understood that development policies and outcomes in Japan and Taiwan (and Korea) had numerous elements in common.
10. Characteristics of the new agricultural technology are reviewed and analyzed in Dasgupta (1977), Binswanger and Ruttan (1978), Food and Agriculture Organization (1968, 1969), V. K. R. V. Rao (1974), Shaw (1970), and Byres (1972).
11. The Report of the National Commission on Agriculture comments as follows: "The demands for additional labor in farm production as a result of improved technology arise from larger numbers of ploughings, repeated irrigations, line planting, intensive inter-cultural practices and from larger harvest. Apart from larger crops that have to be harvested and threshed, greater care is required in the application of cultivation practices and land and water management. Besides, employment is also created on account of increased intensity of activities that accompany and follow the new technology. These activities include seed production, drying and storage of grains, milling, processing, marketing and transport" (Government of India, 1976c, p. 13). Of course, labor requirements generated by the new technology must be reckoned in terms of preexisting uses of labor. Where extremely high levels of labor are already being applied, as in Meiji Japan, the introduction of HYVs and chemical fertilizers may be labor saving (Ishikawa, 1978). The employment potential of the green revolution in South Asia arises because of the relatively small amounts of labor currently applied per acre.
12. Wharton (1969, p. 475). Optimistic assessments of prospects for the use and impact of the new technology appear in the F.A.O.'s The State of Food and Agriculture for 1968 and 1969.
13. The Report of the National Commission on Agriculture pinpoints areas where the new technology has had a significant impact on yield and output trends (Government of India, 1976a, Chapters 3 and 4). Bhalla (1977) reviews growth of wheat and rice production in India on a district-wide basis. Other studies of green revolution "success stories" in India include Byres (1972), Bardhan and Bardhan (1973), The Economist (1978), Ghose (1979), and V. M. Rao (1979); for Pakistan, see Nulty (1972), Eckert (1977), Mahmood (1977), Falcon and Reville (1978), D. A. Khan (1978), Naseem (1979); for Bangladesh, see Bose (1974), Clay (1978b), and A. R. Khan (1979). Rao and Thamarajakshi (1978)

find that the new technology in conjunction with an increase in irrigation potential has "enlarged the stable component of agricultural output" in aggregate terms.

14. Evaluations of the performance of the seed-fertilizer technology in the region are provided in International Rice Research Institute (1975) and Asian Development Bank (1978). For India, Government of India (1976a, 1976b, 1976c) is comprehensive and critical. Also see Ladejinsky (1976) and Hanumantha Rao (1975). The disappointing results experienced in Pakistan since 1970 are reviewed in Government of Pakistan (1978) and Brown (1977a, 1977b). On Bangladesh, see Hossain (1978) and Islam (1978).

15. Dantwala (1978), Dandekar (1978), and Rudra (1979) argue that the main contribution of HYVs in India has been to maintain the trend of growth of food production at the rate established in the 1950s and 1960s—that is, to preserve rather than improve the balance between food and population.

16. Perrin and Winkelmann comment: "Agricultural technology is more site-specific than we were led to believe by some of the early successes with wheat and rice varieties. . . . In the areas not already dominated by new varieties, the factors limiting yields are so disparate and complex as to make it unlikely that any single new variety can repeat the success of the early releases. . ." (1976, p. 893).

17. This point is brought out in Food and Agriculture Organization (1968), Islam (1974), Dasgupta (1977), and Chaudhuri (1978).

18. The efforts of South Asian governments to keep abreast of demands for inputs, to expand irrigation networks, and to establish research programs are well documented. For the region as a whole, see Asian Development Bank (1978); for India, the appropriate chapters of Government of India (1976a, 1976b, 1976c); for Pakistan, Falcon and Revelle (1978), Brown (1977a, 1977b), and Weinbaum (1978); for Bangladesh, Islam (1978).

19. New water control and application practices are involved. Farmers must learn how to vary the quantity of fertilizer and the proportions of nitrogen, phosphate, and potash according to soil type. The use of pesticides is especially complex and difficult. HYVs are being replaced within two or three years of introduction, and farmers must learn to revise their calendar of operations and practices with each change. The new varieties require regular renewal, whereas farmers are not accustomed to buying seeds (Dasgupta, 1977, p. 354).

20. Singh (1978) and Dasgupta (1977) report on studies of the problems of small farmers in taking up the new agricultural practices. Small and large farmer differences in the use of "non-traditional" inputs and in productivity are brought out for Pakistan in M. H. Khan (1979).

21. K. Bardhan (1977) surveyed the literature on the labor demand implications of the seed-fertilizer technology and use of tractors and on supply side changes in the size and composition of the rural labor force.

22. The pattern of agricultural growth and the development and application in Japan of a highly productive seed-fertilizer technology are treated in Johnston (1966), Crawcour (1969), Hayami (1975), and Ishikawa (1967, 1978).
23. See Sawada (1965), Hayami and Ruttan (1971) and Johnston and Kilby (1975), along with the references cited in note 22.
24. Johnston and Kilby (1975, pp. 128-133, 147-148, 390-454).
25. The desirable effects of a Japan-Taiwan strategy are elaborated upon in Johnston and Kilby (1974, 1975), Johnston (1966, 1969, 1970, 1972), and Johnston and Cownie (1969).
26. Johnston and Kilby (1975), Johnston (1966, 1972, 1977), Johnston and Martorell (1977), and Johnston and Meyer (1977). A similar view is expressed in Rich (1973) and Kocher (1973).
27. Johnston and Meyer (1977) cite Freedman and Berelson (1976) in arguing that family planning programs are not likely to have a significant impact in the absence of changes in attitudes and motivations regarding optimal family size (also see Johnston and Kilby, 1975, p. 138). Johnston (1977) and Johnston and Meyer (1977) suggest that, although the spontaneous (i.e., behavioral) linkages between reductions in infant and child mortality and fertility are not strong, policies to improve the health and nutrition of mothers and children may work in conjunction with other variables to change family size preferences (see also Rich, 1973). Johnston and Kilby (1975) refer briefly to the importance of education in strengthening the effect of family planning programs. The numerous and complex connections between educational aspirations and attainment and fertility are discussed in Rich (1973), Kocher (1973), and Cassen (1976). Kocher notes that demand for education is fundamentally dependent on patterns of growth and distribution of development benefits. In itself education may have a direct bearing on fertility behavior through the process of taste formation and by improving access to information on contraception.
28. A standard of living effect is discussed by Hagen (1959) and incorporated into his analysis of differing empirical cases of population growth.
29. Mueller (1971). Mueller is cited by Johnston and Kilby (1975) and by Kocher (1973). See also D. Freedman (1970, 1975).
30. Mueller (1971, p. 5).
31. Mueller (1971, p. 5).
32. Alternative factors or reference groups that could influence tastes and aspirations are reviewed in "Fertility, Aspirations, and Resources: A Symposium on the Easterlin Hypothesis" (see D. Freedman, 1976).
33. Mosk (1979).

34. Hanley and Yamamura (1977). Also see Smith (1977).
35. Okita et al. (1979). Also see Hanley (1975), cited in Mosk (1979).
36. Dore (1953-1954, p. 76).
37. Mosk (1979, p. 34).
38. Dore (1953-1954, pp. 66, 72).
39. Cain (1977).
40. White (1975). Also see Nag, White, and Peet (1978).
41. Leibenstein (1957, Chapter 10).
42. Cain (1978).
43. Ben-Porath (1977).
44. Blandy and Woodfield (1977).
45. In this paragraph I draw on Ben-Porath (1977) and Blandy and Woodfield (1977).
46. Scott (1976) brings out the past importance of such arrangements in Asian settings. Alavi (1972) gives numerous examples of support functions and security arrangements invested in biraderi (kinship) ties in West Punjab villages.
47. On the Meiji inheritance see Smith (1959), Crawcour (1965), Ishikawa (1967, 1978), Hanley and Yamamura (1977), and Hayami (1975).
48. See Smith (1959), Ishikawa (1967), Hayami and Ruttan (1971) and Hayami (1975).
49. Crawcour (1965), Sawada (1965), Hayami (1975), Hanley and Yamamura (1977), and Ishikawa (1978) provide examples of advanced agricultural practices known in early Meiji Japan.
50. Vaidyanathan and Jose (1978) note that the amount of irrigation needed to supplement natural rainfall to raise cropping intensity is much higher in South Asia than in Japan and Taiwan.
51. Hayami and Ruttan (1971), V. K. R. V. Rao (1974), and Hayami (1975) discuss the heavy expenditures that will be required to bring new areas under irrigation and to repair, maintain, and upgrade existing facilities.
52. This paragraph draws on Davis (1951), Beteille (1974), Scott (1976), Frankel (1973), Rosen (1975), Smith (1959), Fukutake (1967), and Nakane (1967).

53. The characteristics and roles of the Meiji landlord are treated in Dore (1959, 1965), Ishikawa (1967), Lawcour (1969), Hayami (1975), and Waswo (1977).
54. The Land Adjustment Act is discussed in Sawada (1965), Hayami (1975), Waswo (1977), and Akino (1979).
55. Dore (1959) and Fukutake (1967) are basic references on levels of living and patterns of organization in the Japanese countryside in the late nineteenth and early twentieth centuries.
56. The strength of village cooperation was evident in the agricultural depression of the 1920s and 1930s. High rents became especially burdensome as the price of rice fell. Landlord investment was directed to urban areas, and "parasitic landlordism" became a rallying cry in rural areas of Japan. A tenants' organization was formed to press for rent reductions and security of tenure. This Farmers' Union did not succeed in overturning the landlord system; however, the level of economic and political organization attained in the Japanese village was an important factor in the success of the postwar land reform.
57. Klein (1974) provides an overview of growth and mortality rates on a regional basis in India in the 1872-1921 period.
58. Byres (1974) surveys agrarian structure in British India at the time of independence. Rosen (1975) and Whitcombe (1972) are excellent sources on the social and economic consequences of British rule.
59. Government of India (1976a, 1976b, 1976c) includes an analysis of trends in yields by crop and region in the 1900-1930 period.
60. K. Bardhan (1977) and Epstein (1976, cited in Asian Development Bank, 1978) refer to the continuing importance of patron-client relationships in rural areas of India. At the same time, K. Bardhan provides numerous examples of sensitivity to market pressures. Mabro (1971) and P. K. Bardhan (1979a, 1979c) attempt to account for the coexisting phenomena of wage rates responding to demand conditions and persistent involuntary unemployment.
61. Davis (1951, p. 15).
62. Scott (1976).
63. Frankel (1973).
64. Beteille (1974).
65. Arthur and McNicoll (1978).
66. Much of the recent literature on agricultural development in South Asia deals with the activities of prosperous, commercial-minded farmers. V. K. R. V. Rao's summary statement is representative: "What seems to be emerging is a

kind of capitalistic farming with a new and dynamic middle class of farmers adopting modernized agriculture and acquiring a new social and political power. . ." (1974, p. 87). A shift in the distribution of operational holdings in favor of larger farmers is discussed in Byres (1972), Hanumantha Rao (1975), Government of India (1976b), Dutt (1977), Bhalla (1977), Lipton (1978), and Naseem (1979).

67. See the study by M. H. Khan (1979). Nulty (1972) and Dasgupta (1977) are useful references on adoption and cultivation patterns in large farm enterprises.

68. Dasgupta (1977, especially Chapter 4).

69. Examples are provided in K. Bardhan (1977). Hayami (1978) describes the appearance of new types of patron-client ties in a Philippine village.

70. See K. Bardhan (1977). Alavi (1976) suggests that rather than evict tenants and reclaim lands for self-cultivation, landlords would prefer to confine tenants to holdings too small to provide subsistence income so as to ensure a supply of wage labor.

71. Such a mechanism is postulated and explored in P. K. Bardhan (1979a, 1979c) and Mabro (1971).

72. Bharadwaj (1974).

73. P. K. Bardhan (1979a, 1979c).

74. See Griffin and Ghose (1979, p. 376).

75. See the discussion in Betelle (1974) and P. K. Bardhan (1974).

76. The small farmer "syndrome" is discussed in Bardhan and Bardhan (1973), Schlutter (1974), Perrin and Winkelmann (1976), Dasgupta (1977), Singh (1978), and Salam (1978).

77. See Benor and Harrison (1977).

78. Krishna (1979) finds that small farmers are "starved" for credit.

79. Such a conflict in interests is the subject of P. K. Bardhan (1979b).

80. Mabro (1971) brings out this possibility. Nayyar (1977b) reports for Uttar Pradesh that those without land were more likely to find wage employment than those with land.

81. Palmer (1978, p. 89) discusses a similar situation in Indonesia.

82. This formulation is similar to that of Stark (1978). Stark argues that small holder adoption of the new technology in the absence of smoothly functioning markets and credit and insurance arrangements actually enhances

the value of children. Migration and remittance of funds by children allow parents to invest in new inputs and improvements.

83. Clay refers to a "myth about Bangladesh. . .that it is a country of small peasant owner-cultivators. The most recent information on land occupancy. . . demolishes this myth. The number of landless rural households. . .appears to have doubled between 1960 and 1977, rising from an estimated 17 percent (1960 Agricultural Census) to over 30 percent. . ." (1978a, p. 8). In India, the 1971 Census of Population and the Rural Labor Enquiry of 1974-75 found dramatic increases in the number of farm labor households (Economic and Political Weekly, 1978). P. K. Bardhan (1979b) notes the increase in hired labor in India in districts covered in a resurvey of farm management practices. Ghose (1979) provides evidence of the emergence, at differing rates in the 1911-1961 and 1961-1971 periods, of wage-labor based production in the Punjab and Bengal (see also Bandyopadhyaya, 1977). Nayyar (1977a, 1977b) reports on the increase in the number and proportion of agricultural laborers in the labor force in Uttar Pradesh and Bihar in the 1951-1971 period.

84. A careful study by Sharma concludes that "the green revolution in the Punjab has significantly increased both the level and the stability of employment of agricultural laborers as well as farmers" (1974, p. 423). Hanumantha Rao (1975) and Dasgupta (1977) reach similar conclusions with respect to adopting areas in India as a whole.

85. Dasgupta (1977) sees a pattern of withdrawal in prosperous households of women and children from the labor force.

86. P. K. Bardhan (1979c) reports on labor hiring practices in West Bengal. Also see Dasgupta (1977, pp. 322-323).

87. Dasgupta (1977) and K. Bardhan (1977) both cite the case of Kerala, where farm labor unions have helped to institutionalize collective bargaining.

88. See P. K. Bardhan (1979a). A thorough analysis of "factors in rural proletarianization" appears in K. Bardhan (1977).

89. The employment impact of agricultural mechanization is the subject of studies by Hanumantha Rao (1974, 1975). K. Bardhan (1977) reviews a number of micro- and macro-level studies of the effects on labor demand of mechanical harvesting, threshing, and reaping.

90. Dasgupta (1977, p. 232) notes that landowners often succeed in keeping wages low in areas of concentrated ownership.

91. Dasgupta (1977, p. 340). Studies suggest that the economic position of farm laborers has worsened in a number of areas (see K. Bardhan, 1977; Nayyar, 1977a, 1977b).

92. The possibility of such an outcome is suggested in Mabro (1971) and demonstrated for a village in the Philippines in Hayami (1978).

93. Approaches suggested in Mosher (1969), Bell and Duloy (1974), V. K. R. V. Rao (1974), and Krishna (1979) represent variations of the integrated strategy.
94. McNicoll (1975) discusses policy measures that might contribute to demographic stabilization in an integrated rural strategy.
95. Stryker (1979) refers to a number of shortcomings of the integrated strategy that has been backed by the World Bank.
96. I have drawn on Palmer's review of "the role of extension" (Palmer, 1976). Also see Stavis (1979).
97. P. K. Bardhan (1974), Brown (1977a, 1977b), and A. R. Khan (1979) consider the possibility that program goals and operations may be undermined by vested interests in rural areas.
98. Minhas (1970). Also see V. K. R. V. Rao (1974) and Dandekar and Rath (1971).
99. The essence of such a strategy is set out in Sinha (1973).
100. In his review of a rural works project in Karnataka, Donovan suggests that "group work experience may have an important effect on attitudes which will carry over into future jobs" (1973, p. 1). He comments that "it might be worthwhile to build up local organizations such as labor cooperatives which would be the forerunner of organizations which more effectively present labor's case regarding work conditions and wage levels. . ." (p. 6).
101. Nulty (1972) is concerned that difficult management problems in operating larger farms with hired labor might induce owners to mechanize. Hanumantha Rao (1975) warns of inflationary consequences if rural employment programs fail to lead to greater production.
102. See Reynolds and Sundar (1977).

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