

Why Agriculture Productivity Falls

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The Political Economy of Agrarian
Transition in Developing Countries

Rashed Al Mahmud Titumir

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Dedicated to my parents
Rawshan Ara Begum
M Arshad Ali

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Rashed Al Mahmud Titumir

Dhaka

INTRODUCTION

THE BOOK PRESENTS A NEW EXPLANATION FOR THE DECLINE IN AGRICULTURAL productivity. It recognizes that agrarian transition and agricultural productivity go hand in hand in understanding the dynamics of agriculture in developing countries. Agricultural productivity is crucial for stimulating growth and the resulting transformation. In unearthing answers to the question of falling agricultural productivity, the book develops a framework beyond the usual reductions of mainstream approaches to understanding productivity using agricultural inputs and factors of production. It brings in the role of the formal and informal institutions that govern transactions, property rights, and accumulation among farmholding communities.

Agricultural production has seen a major shift since the end of the last century when factors like mechanization, irrigation, fertilizers, and pesticides were introduced by the Green Revolution. Although the benefits brought about by the Green Revolution led to major breakthroughs, with countries aiming for food security, the bubble burst as productivity began to slow down in developing countries. The existing process of accumulation has resulted in unsustainable agriculture and also in a nonsustainable agriculture because of market failures caused by asymmetries of power, diseconomies of scale, and unstable property rights, resulting in arrested productivity growth.

The exploration of theoretical apparatuses through empirical validations reveals that agrarian development and agrarian transition are to be understood in relation to the wider (nonagrarian) economic development in society, as political settlement and primitive accumulation permit (inhibit) property rights being reallocated in growth-enhancing directions. Today, the twofold challenge for sustainability of agriculture is to meet the growing food demands of a population at prices that are accessible for the poor while at the same time minimizing the adverse impacts on the environment.

Using political economy analytical categories such as class, power, and the imperatives of the market at the center of an investigation into structure and change in the rural economy makes it a unique way to steer vigorous informed debates against the backdrop of declined productivity growth in agriculture. This allows engagement with the debate on the market and nonmarket forces driving agrarian transition and challenges the simplistic size-productivity proponents who argue that small farms are more productive.

Agrarian transition differs from country to country. There is no one version of the process that is applicable across cases. Rather, there are different accounts of the process

of capitalist development. These differences arise not only from the diversity of historical experiences but also from contending interpretations of the causality at work in specific cases. It provides an alternate explanation for falling agricultural productivity in developing countries, one that moves away from the mainstream, neoclassical paradigm to offer new interpretations of its causality.

The sample developing country with agricultural lands and communities discussed throughout the book has been selected on the grounds of its having a relatively large population in proportion to the available land area, which is the case in Bangladesh. The village-wise sections identify broader trends to depict the nature of accumulation, divided in terms of villages. The villages are chosen on the basis of representation of urbanization, encroachment on natural resources, degree of climate vulnerability, predominance of nonagricultural occupations, and dependence on subsistence production.

The book also consists of an ethnographic study of the four villages, representing the diversity of Bangladesh, which is corroborated with the national-level sectoral and macroeconomic data, making a space to travel into both worlds. An ethnographic description of the villages adds insights on nuances and subtleties to fill in the gaps of quantifications, which in some cases hide rather than reveal. The narration includes firsthand knowledge of demographic dimensions and their effects on land, and the influences of political power relations exerted on market structure. It also employs mathematics, game theories, graphs, and diagrams to make certain propositions, prove these mathematically, and validate them empirically.

I

AGRARIAN QUESTION AND PRODUCTIVITY GROWTH

INTRODUCTION

This book seeks to understand the growth of productivity in the agricultural sector by examining transactions in land and different factors of production against the backdrop of agriculture's critical role in the economy, particularly in developing countries. In sum, it explores two questions: (a) Does the existing *allocation* of property rights over land accelerate (or restrict) net output and unleash growth, and (b) what are the factors that permit (or inhibit) property rights being *reallocated* in growth-enhancing directions? In addition, the study also tries to explore how effective the existing theoretical responses are to these questions.

In unearthing responses to the questions above, an alternative framework is developed beyond the usual reductions of mainstream approaches, incorporating analytical categories such as class, power, and the imperatives of the market at the center of an investigation into structure and change in the rural economy, focusing on land transactions. It thus provides explanations of the dynamics of transition: how market and property relations break down or reinforce the obstacles to growth in the agrarian economy.

The discussion outlines the two main approaches to analyzing capitalist development in the agricultural sector. The first is broadly referred to here as the "market-centric" approach and is embodied in neoclassical economic theory that views the economy as being primarily defined by market-based activities. The second is a Marxist political economy approach based on the idea that economies are distinguished not only by their market and nonmarket characteristics, but in terms of their relations of production, which are the relationships of power between classes within a society. Central to this paradigm is the so-called "agrarian question," which refers to the patterns of change that occur in precapitalist/peasant production within the process of capitalist development.

These two frameworks and their related theoretical perspectives provide various explanations for the transition to capitalist development as well as the agrarian question,

with corresponding prescriptions for agriculture. The focus in all cases is on factors of production—the principal means of production and institutions—and its productive potential. There is a general agreement that land use and agricultural productivity are crucial for stimulating growth in agriculture and that a transformation in the agrarian sector will stimulate and enable broader capitalist development. The disagreement revolves around what underpins such transformations, and accordingly, what actions—if any—should be taken to support and facilitate agricultural transformations.

Given the interests and incentives of critical agents in agriculture, even the process of consolidation through the market requires the use of political power. The structure of political power in villages in developing countries often constrains the operation of market and nonmarket transactions in ways that prevent or slow down consolidation and therefore productivity growth. The study thus contends that the dynamics behind productivity-enhancing changes are also driven by characteristics of the political settlement, not just by administrative and bureaucratic features that can be developed through technocratic reforms, as found in most contemporary policy discussions. Following Marx, this study also traces “extra-economic” forms of asset allocation carried out by means of political, juridical, and military power, or what Brenner (1985) calls “politically constituted property.”

Thus, the study makes a distinction between (a) market accumulation, and (b) non-market accumulation (primitive accumulation). The configuration of power in society is a critical variable determining the pace and direction of the agrarian transition that can in turn explain long-term productivity growth. The transition to more productive modes of production is thus not a process whose drivers and constraints are entirely determined at the level of the farm or even of the village, pointing out the major shortcomings of most studies of the agrarian transition. The role of the state is manifested in the implications of factional competition, the role of the intermediate classes, and political fragmentation—all of which affect the processes of primitive accumulation.

The investigations, as presented in subsequent chapters, challenge the simplistic size-productivity proponents who argue that small farms are more productive, and therefore, market and nonmarket transactions that prevent land transfers to smallholders constrain productivity growth. Instead, the research tries to demonstrate that land is getting more fragmented through demographic processes, with smallholding agriculture increasing as opposed to the concentration of land in the hands of large farmers, otherwise known as polarization, though landlessness is on the rise.

The study argues that land is treated as savings rather than an investment, as people who are buying land are mostly not farmers and not directly engaged in agriculture, and therefore are not interested in collateralizing their land ownership to invest in the land to increase productivity. The actual farmers or peasants do not have the capacity to buy land due to the high prices of land in a land-scarce country, and prices are steadily

pushed up by people who are saving by buying land, for instance by remitting income from cities or abroad, or by people who are buying land for industry or other purposes.

Besides, farm sizes have become a crucial factor when other factors of production like fertilizers, pesticides, and irrigation are considered. Naturally, small farms are restricted in terms of the necessary capital required to invest in mechanization in irrigation, and this limits small farms to produce year-round. The marginal profit from the harvest leaves little room for future investments.

Globally, as economies have been growing, there has been a major shift in labor from agriculture to manufacturing and service sectors. As a result, the agricultural sector has been facing a decline in terms of employment share. However, it still remains a major sector and generates the highest employment in developing countries. Declining employment and the introduction of modern technologies in agriculture have increased labor productivity. Labor still plays a major role in agriculture. Similarly, capital takes a significant part in determining output and land relations in agriculture. Limited access to capital constrains the small farmholdings in attaining economies of scale. On the other hand, large farmholdings usually have higher returns and savings, allowing the farms to achieve economies of scale and further alienating the small and medium farms. The situation is similar in technology, where large farms have greater access to technologies. Technologies have become a crucial factor of production. Having higher technological inputs like improved seeds and fertilizers along with modern irrigation allows farms to adopt multicropping. This has also been a factor responsible for turning fallow and infertile land into arable land, increasing overall agricultural lands in countries.

In contrast to the orthodox frameworks, the research demonstrates that the common underlying feature in all the villages is political settlement. Political power allows systematic nonmarket transfers and tilts the market playing field in favor of particular groups, without creating the conditions for a systematic transition in the organization of production toward capitalist agriculture. The processes of accumulation, thus, have resulted in a nonsustainable agricultural trajectory. Market failures sustained by power asymmetries that prevent a viable land structure from emerging, diseconomies of scale that affect small farmers, and unstable property rights have led to low growth of output and productivity.

It also demonstrates that the available agricultural technology is arguably not necessarily scale neutral, but compulsion on small peasants for maintaining their subsistence income has resulted in self-exploitation that has resulted in output growth, but with huge negative unintended consequences of declining sustainability and biodiversity. The smallholders have not been able to increase the size of their holdings and have remained peasants of a sort, rather than becoming capitalist farmers, even though agriculture is highly commercialized.

Breaking out of the suboptimal productivity growth trap requires a steep change in land consolidation, and an understanding that market and institutional reforms that do not pay attention to the organization of political power will be insufficient to ensure a productive transformation.

A new agriculture question has emerged, which traditional theoretical frameworks and empirical studies have not been able to identify, and therefore these have not been able to explain the reasons behind lagging productivity growth.

The sample developing country with agricultural lands and communities discussed throughout the book has been selected on the grounds of having a relatively large population in proportion to land area available, which is the case in Bangladesh. The village-wise sections identify broader trends to depict the nature of accumulation, divided in terms of villages. The demographic characteristics, land relations, production processes, exchange processes, land transactions, state, power, and politics of each village are investigated in depth as part of the ethnographic study on agrarian transition. The villages are selected on the basis of representation of urbanization, encroachment on natural resources, degree of climate vulnerability, predominance of nonagricultural occupations, and dependence on subsistence production.

UNDERSTANDING AGRARIAN CHANGE

The framework constructed here helps us better understand the relationship between land and productivity—the means of production and the shift in mode of production—by drawing on both analysis and evidence gathered from extensive fieldwork in villages.

Explanations in the literature have undergone a process of evolution in theme and approach, and this is also reflected in the policy domain. On a broader level, two distinctive traditions are discernible: (a) a market-centric approach, and (b) a political economy approach.

Market-Centric Theoretical Approaches

The foundation of the market-centric view dates back to classical political economy, with subsequent refinements within neoclassical economics, the Austrian tradition, “supply-side” economics, new institutional economics, and contemporary new political economy. The distillation of these theories has come to be known as “neoliberalism.” The approach is cemented on demand-and-supply-based equilibrium (DSE) theory, which “has adopted a ‘universal’ mode of exchange in the form of its concept of

‘market’ and price-guided resource allocation and has proceeded to translate all individual behaviour into ‘market behaviour’” (Bharadwaj, 1986).

The market-centric model assumes that market exchanges are a natural process and considers the elimination of impediments to a competitive market as its theory of development. There is no denying that there have been age-old practices of trade and commerce, “with or without a natural inclination to ‘truck, barter, and exchange’ (in Adam Smith’s famous formulation), as rationally self-interested individuals have been engaging in acts of exchange since the dawn of history” (Wood, 2002a). The theorists in the market-centric tradition see the market as an *opportunity* while Wood (2002b) has argued that the operative principle for understanding market dynamism is *compulsion* or imperative, not opportunity.

Turning to agriculture, even in the context of traditional economics, needless to say, the present-day standard bearer of “market centric approaches,” neoclassical economics, has done nothing to displace its general notions. The focus of neoclassical economics applied to farm economics is to look at issues such as (a) price-responsiveness (e.g., Askari & Cummings, 1976), (b) efficiency in the utilization of factors of production (e.g., Schultz, 1964; Wise & Yotopoulos, 1969), and (c) efficiency of tenurial relations (e.g., Bardhan & Srinivasan, 1971; Cheung, 1969; Marshall, 1961). That is why Schultz (1964), a major proponent of this approach, has maintained that “the doctrine that farmers in poor countries either are inefficient or respond perversely to changes in prices . . . is patently false.” Schultz’s assertion, however, received some criticism within the broader neoclassical tradition, as Lipton (1968) states that subsistence agriculture is a “gamble of monsoon” and the peasants in traditional societies are motivated by survival rather than profit considerations.

An examination is in order to find out the prudence of the analytical categories used in such approaches, particularly the robustness of their applications in explaining growth in the context of traditional agriculture in low-income countries. This, however, will be brief since the scope of the study per se is not to demonstrate all the limitations of such theories, but rather to identify the processes, based on empirical investigation, that promote (or hinder) the growth of the rural economy of a particular country.

Schultz (1964), along with others in the tradition, universalizes the textbook formula that efficiency is achieved when the marginal product of each factor equals its factor price in the market, and asserts that farmers in poor countries are “efficient” producers. This decontextualized treatment of the cultivators and their problems of resource acquisition and allocation, based on an analogy with the conventional theory’s firm in a competitive market, is based on highly restrictive and unrealistic assumptions of perfect competition. Rudra (1992) illustrates the irresolvable logical contradiction of the analytical framework of the neoclassicists with respect to *allocative efficiency*

and shows such logical inconsistencies render the framework incapable of yielding any valid results.

Second, decision-making in such an approach is fraught with unrealism due to its nonrecognition of variations in terms of *scale, objective function and organization*, and *labor process*, both within the category of owners as well as within the category of tenants (Patnaik, 1994).

Third, these models also assume the *homogeneity* of peasants, which presupposes an absence of economic differentiation among owners and tenants, or implicitly assumes that such differences that do exist are unimportant for the issues being discussed. The formulation of the contemporary neoclassical literature of homogenous peasantry goes back to Chayanov (1915/1966), who has provided a systematic exposition of the equilibrium arrived at by the family-labor farm. While attempting to incorporate differentiation, some contemporary neoclassicists model differentiation by deriving it from other factors, ignoring property concentration, which in effect remains analytically similar to that of Chayanov (e.g., Eswaran & Kotwal, 1989). Chayanov maintains that the peasantry is homogenous and composed of comparable household farm units. Contrary to the Leninist theory of differentiation and polarization (1960), Chayanov argues that “farm size tended to follow a cycle coincident with the peasant family life cycle, increasing as the family members matured into workers and declining as the family aged and disintegrated with the formation of new families” (Rahman, 1986, attributed to Millar, 1970). The Chayanovian proposition has received a lot of criticism (e.g., Harrison, 1977; Patnaik, 1979), both analytically and empirically, leading to a new school of thought known as the “organization-production school” or “populism.”

Fourth, they attribute *efficiency* to small and poor peasants because of their intensive use of labor and higher output per unit area, but this may actually be involuntary and could indicate an inefficient mode of labor deployment. The intense work by petty producers is *imposed* on them by the property structure and not chosen voluntarily by them. The application by smallholders of “huge amounts of very low productivity labour to tiny parcels of land” partly reflects the fact that they face “acute risks of starvation that necessitate the severe exploitation of all family labour” (Sender & Johnston, 2004). Dyer (2004) shows that extraction under a “pre-capitalist mode of production drives poor peasants to maximise output because their survival depends upon it.” The highest possible output per unit area achieved by petty producers is at the expense of lower labor productivity, while well-to-do cultivators are able to invest in productivity-raising techniques by retaining part of the surplus. The latter are not inefficient just because these cultivators do not have to lower labor productivity to survive. This issue is also associated with arguments about the “inverse relationship” between farm size and land productivity, which will be further discussed in the context of “neoclassical neopopulism.”

Fifth, the neoclassical analysis of property rights and rents falls short of an explanation of stagnant agricultural growth. This, in part, is attributable to the absence of an analysis of agrarian relations in the modified version of Ricardian differential rent that focuses on variations in land fertility, completely ignoring the *absolute ground rent* (for an early exposition of the concept of what Marx was to call “absolute ground rent” see Adam Smith, 1961; Ricardo’s misconceived criticism of Smith in Ricardo, 1823; and Marx’s defense of Smith’s concept against Ricardo in Marx, 1969). The latter represents an income that an owner gets by virtue of legal title, which is ignored in the neoclassical model. Smallholders, in most cases, who are mostly tenants, therefore are *compelled* to produce a surplus profit equal to rent over and above an average profit by intensive use of labor, with a higher rate of exploitation. On the other hand, the prevalence of absolute ground rent acts as a barrier to investment due to the institutionally fixed share of rental income (Bhaduri, 1973). Patnaik (1994) argues that such barriers operate regardless of the interlinking of leasing and credit by the same landlord (which is the case in Bhaduri, 1973), and that “the landlords will not invest productively and there will be perpetuation of stagnation in productivity as long as the total profitability of direct investment is not sufficiently high to overcome the rent barrier.”

Sixth, within the broader framework of neoclassical economics, the “techno-economic school” argues that the transformation in agriculture lies in the improved agricultural technology (or utilization of agricultural inputs): intensity of irrigation, higher rate of adoption of modern varieties, and availability of fertilizers and pesticides. The school evades the key reality that productive forces consist of people with their production experience and skills, and instruments of production. These elements evolve through, and are part of, the *labor process*, which describes the “manner in which direct labour is combined with means of production in the production activity.” This involves much more than the use of “simple” or “modern” techniques and depends on the organization of labor itself (Pearce, 1983). For example, petty producers may be *forced* to acquire “new” technology in the wake of failing crops, despite rising input costs and falling profitability, to intensify acreage for sustenance, or to provide rent as tenants, simultaneously engaging in distress sales and plunging into indebtedness. Thus, the process of technology acquisition (unleashing the potentials of productive forces) or lack of it has to be understood in the context of social property relations, manifested in inequality in ownership or control of the means of production and/or labor power.

Couched in the language of neoclassical economics, there is a longstanding literature, which has come to be known as “neoclassical neopopulism,” that combines the neoclassical analysis of “efficiency” (competitive market production) and “equity” (an egalitarian distribution of landholdings and rural incomes) with notions of a specific peasant type of production *à la* Chayanov (1966). Scott (1977) called it “neo-classical populism” in a review of Griffin (1974), and Byres (1979) subjected Lipton (1977)

to an extensive and powerful critique. Griffin (1974) and Lipton (1977) “converged in much of their analysis, argument and advocacy, and still do” (Bernstein, 2006). Bernstein (2002) suggests that “Lipton’s adaptation appears more extensive, not least in embracing the World Bank’s current stance on the benefits of [the] ‘new wave’ of market-led land redistribution (and its associated baggage): ‘Previous land reform programmes have been unduly confiscatory. “New wave” land reform . . . is decentralised, market-friendly and involves civil society action and consensus” (IFAD, 2001). Lipton likewise envisaged “a consensual reduction of the world’s most severe (and most radicalised) inequality” through (“new wave”) land reform in postapartheid South Africa (Lipton et al., 1996). Griffin, Khan, and Ickowitz (2002), hereinafter GKI, using a standard static neoclassical framework, reiterated the proposition of “redistributive” land reform based on the “established” inverse relationship in a wide range of countries, and especially on the claims of Berry and Cline (1979).

A group of critical scholars (Bernstein, 2006; Byres, 2004; Dyer, 2004; Khan, 2004; Sender & Johnston, 2004) have shown why the arguments of neoclassical neopopulism including GKI are both logically flawed and not supported by the evidence, and hence why the principal policy conclusion of redistributive land reform is not supported. These writers demonstrate the need for a dynamic political economy approach due to the deep theoretical flaws associated with the analysis of the inverse relationship in a static marginalist framework, which assumes away institutions including power and property relations.

Mushtaq Khan (2004) notes that the position of GKI (redistributive land reform) and that of the World Bank’s (e.g., Faruqee & Carey, 1997; World Bank, 2000) market-led reform may *prima facie* appear to be “radically opposed,” but they have “much in common” since both approaches draw on neoclassical economics. Khan also rejects the transaction costs argument and argues that the dynamics and the constraints of agrarian transitions can be understood through class, power, and the processes of primitive accumulation.

The so-called robustness of petty producers is taken up by Bernstein (2004) who points out that, unlike GKI, this has to be explained as an outcome of class differentiation. Bernstein (2006) critiques GKI for ignoring what he terms the “real politics of land.” Khan (2004), too, argues that the configuration of power in society is historically specific and can only be analyzed in the context of specific cases, as opposed to GKI who recognize the political obstacles, yet fail to accommodate it in their model. Khan (2004) stresses the importance of institutions, particularly the property structure and the configuration of power, in explaining the pace and direction of the agrarian transition that can, in turn, explain long-term productivity growth.

The literature on the alleged inverse relationship between farm size and land productivity comprises a vast body of empirical and theoretical work scattered throughout

many journals and studies over a long period of time, but the Indian debate was an intense one with huge participation. The Indian debate began in the pages of the *Economic Weekly* (later *Economic and Political Weekly*) with Amartya Sen's (1962) article. It continued over the years with participants being, among others, Mazumdar (1963, 1965), Sen (1964a, 1964b), Khusro (1964), A. P. Rao (1967), C. H. H. Rao (1966, 1968a, 1968b, 1968c, 1972), Rudra (1968a, 1968b, 1973), Patnaik (1972), and Rudra and Sen (1980). Other major contributions came from Sen (1966), Saini (1971, 1979), Roy (1981), and Patnaik (1987). A reprise of the debate took place in the pages of the *Economic and Political Weekly* (Dyer, 1998).

On the alleged inverse relationship, Dyer (2004) points out that the conditions that sustain this relationship are of paramount importance. He notes that depiction of the inverse relationship as a sign of relative efficiency is erroneous, and it is a condition of distress. Dyer (2004) states: "Clearly we must go deeper than the size of holding categories to the underlying social relations of production." Dyer's works (1991, 1996, 1997, 1998, 2004) contain critiques of the proposition and provide a class-theoretic analysis.

The "new institutional economics" (NIE) developed within the broader tradition of neoclassical economics to justify and develop the intellectual position that institutions should not simply be taken as given but should be explained and their effects analyzed (Stiglitz, 1989). The NIE explains economic growth as a process of institutional change, where institutions are defined broadly as the "rules of the game," are made up of formal laws and informal norms, and interact with organizations to explain growth or stagnation (North, 1990). North (1990) characterizes institutions as "the humanly devised constraints that structure human interaction. They are made up of formal constraints (e.g., rules, laws, constitutions), informal constraints (e.g., norms of behaviour, conventions, self-imposed codes of conduct) and their enforcement characteristics. Together they define the incentive structure of societies and specifically economies."

The NIE broadly started with Ronald Coase (1962), who argued that property rights ensured incentives for transacting parties to behave efficiently. Institutional economics in its modern form was further developed by Douglas North. In the early NIE literature the individual exercising choice is the agent of institutional change. North and Thomas (1973) and Ruttan and Hayami (1984) argue that institutional change occurs as individuals respond to changes in relative prices and engage in a voluntary bargaining process that results in the desired institutional change. Later NIE models (North, 1987, 1990, 1995; Olson, 1982) provided a more process oriented and less functional model of economic history. But these too are subject to rigidities since institutional change remains a function of political and economic transaction costs and all changes require agreements on compensations to losers that are paid in full. Despite a gradual evolution within the NIE, its *theory* of development is essentially a neoclassical one—a unilinear path of development, but now subject to transaction costs.

First, in the NIE models the structure of property rights determines the “incentive structure” facing individuals. The distributional consequences are considered to be unimportant to the analysis. Second, the ways in which power relations may work are ignored in the NIE since the NIE approach to rights formation assumes away issues of power and legitimacy. This is due to the NIE’s reliance on methodological individualism, which focuses on individual rationality driving the bargaining between individuals and fails to identify the importance of the sources of bargaining power (DiJohn, 2004). Third, consistent with the optimization approach of neoclassical economics, the analysis of individual choice is separated from the analysis of distribution. But this separation is untenable in a world where conflicts over distribution affect the evolution of institutions. Hirschleifer (1994) has posited that the two main and separate strands of the resource allocation problem in economics are, on the one hand, the production of goods and, on the other, the conflicts over who appropriates wealth. Fourth, and related to this, the NIE typically ignores historic specificity when in reality property rights specify a historically specific distribution of control and authority over assets (Dahlman, 1980, pp. 213–214).

These observations point out the fact that the NIE *lacks* a theory of power and legitimacy and lacks a proper analysis of the political nature of rights. When the evolution of property rights is seen in the context of political organization and mobilization, rent seeking becomes a particularly important process in a country in transition in driving the evolution of property rights (Khan, 2002b).

The major defects of various shades of orthodox economics, as outlined above, exemplify why these fall short of explaining the *conditions* that stimulate (or inhibit) growth, especially in contexts of transition. In addition, most of these orthodox approaches confuse static allocative efficiency with the conditions that induce the development of productive capabilities, the adoption of new technologies, and the achievement of growth in general. The diagnosis of underdevelopment remains “within the paradigm of the allocation of given resources” (Bharadwaj, 1974).

After the Second World War, a short-lived Keynesian interlude impacted the development literature, and the allocative efficiency paradigm receded with a shift of emphasis to the questions of resource creation and structural change. The official Keynesianism, which accorded legitimacy to regular government economic intervention due to its articulation that economic activity takes place in irreversible historical time and rejected Say’s law and the quantity theory of money, which held sway in the post-Second World War period, embraced its death during the oil crisis of early 1970 and was exposed to virulent attack from Friedman (1956, 1970), who revived the quantity theory of money through monetarism. There has been, however, a recent interest in Keynesianism since the financial crisis of 2008. There are different variants including and within New Keynesians and Post-Keynesians. Contrary to the views of New

Keynesians working in the neoclassical tradition, Post-Keynesians do not accept that the theoretical basis of the market's failure to provide full employment is rigid or sticky prices or wages. The Post-Keynesian view of endogenous money creation changes the view of the causal relationships within the economy by bringing money and finance to center stage, rather than abstracting them out of existence like the New Keynesians.

But the traditional emphasis on the market and efficiency was revived with greater single-mindedness in the 1970s: "Government macroeconomic intervention is worse than useless—it is actually counterproductive" (Lucas, 1972, 1973). Despite some development within the mainstream, like the NIE, some critics of mainstream policies (e.g., Stiglitz, 1994) have been critical of the International Monetary Fund for its way of handling the East Asian financial crisis of mid-1990. Nonetheless, the subsequent period was influenced by contemporary mainstream neoclassical theory establishing the superiority of markets and the policy importance of removing obstacles to markets (market-enhancing-reforms) as the *theory* of development. Lapavitsas (2005) makes the point: "Both the neoliberal Washington consensus and Stiglitz's alternative approach take it for granted that markets are superior to all other social mechanisms for allocating resources and organising the economy. The pronouncements of the IMF and the World Bank since the early 1990s have been typically replete with references to the need to improve information flows, increase transparency, reduce corruption, and generally create a social environment within which markets can perform better."

Brenner (1986) demonstrates that economic development is *not* just the expansion of market opportunities but a social transformation involving fundamental change in class structures, and the transition involves a political struggle and not just the expansion of markets. In other words, as Bharadwaj (1974) describes it: "The continuity in history was provided by the labour process, human activity reflecting the continuously changing man-nature relationship whereby man derived his material subsistence working upon and with nature, transforming nature and transforming himself in the process."

The discussion in the preceding section points to *social property relations*, the means and products of social production. This, in turn, determines *change* and *choice* and *allocative efficiency* (much-hyped concepts of neoclassical economics), since it is ownership (or lack) of *property* that determines the individual's participation in the economy (and in the society as a whole). The preceding sections also point out the fallibility of the "rational individual," a fantastic creature that aims exclusively at private gain, has no altruism and strictly calculates the necessary means to achieve desired ends, but deploys neither power nor violence to achieve them" (Lapavitsas, 2005). In the alternative view, members of a property-owning society are not mere private individuals but are rather "members of particular social classes, on the basis of the character and scale of the property that they own, which is only an expression of the mode of their participation in social production and access to their essential means of subsistence" (Clarke, 2005).

The above paragraph also delineates what *the role of theory* is, which is to *discover the conditions of reproduction* of the production, exchange, and distributive relations specified in particular social property relations. In other words, a framework based on the notion of dialectics between forces of production and relations of production provides a better analytical tool with which to investigate changing economic circumstances.

Political Economy Approach

The foundation of political economy, which is also dubbed classical political economy, is attributed to Adam Smith, Thomas Malthus, and David Ricardo, despite the work of the French physiocrats, such as François Quesnay and Anne-Robert-Jacques Turgot, who predate them. The phrase *économie politique* (translated in English as “political economy”) first appeared in France in 1615 in the well-known book by Antoine de Montchrétien, *Traité de l'économie politique*.

Until Marx, however, such attempts at analytical constructions in classical political economy predominantly remained “more of an immediate response to the extant, historically specific situation, although, as Marx was never tired of pointing out, their expression often conveyed the impression that they considered their particular theoretical constructions to be ‘eternal truths,’ universally applicable to all times” (Bharadwaj, 1986). An extensive critique of Smith has been presented in Brenner (1976, 1977, 1985, 1986) and Wood (1999, 2002a, 2002b).

The domain of theory for Marx is a dynamic one, which “comprehends not only the analysis of logical relations within any particular mode of production but also the questions of transition from one mode to the other” (Bharadwaj, 1986). Marxian political economy is in a better position, among theoretical traditions, to offer such an exploration in an integrated manner, without dissolving into a number of fragmentary disciplines.

The Marxist literature understands the term “agrarian question” as having three broad aspects or component parts. The first relates to the nature, extent, and degree of the development of capitalism in the countryside. The second aspect deals with the properties of the classes that come about on the basis of the development of capitalism in agriculture. The third component investigates class struggle (Ramachandran, 2011).

In Marx’s view, one of the preconditions for the disintegration of feudalism was the development of the land market (Marx, 1979), meaning the simultaneous emergence and development of the land and labor markets—one contingent upon the other (Ullah, 1996). In his explanation, the emphasis is on changes in property relations, a product of class struggles in which the peasantry lost its land and a landless proletariat emerged in England. Engels analyzed the political problems of peasants. See Byres (1986) for a detailed treatment of agrarian questions from the Marxian point of view.

Lenin in his classic *The Development of Capitalism* developed his thesis of “differentiation” of the peasantry in contrast to the life-cycle changes in peasant landholdings in the populist reading of the evidence (*à la* Chayanov). Lenin argued that “capitalism penetrates agriculture particularly slowly and in extremely varied form” (Lenin, 1977, p. 181). There exists a host of literature on Lenin’s thesis including empirical work; for example, Alavi (1965), Patnaik (1987), Deere and de Janvry (1977), and in the Bangladesh context, Rahman (1986). Other critical issues in understanding the agrarian transition were discussed by Karl Kautsky (1976), who argued that the transformation in agriculture assumes a different form than that in industry due to differences in the principal means of production: in industry, the principal means is reproducible capital while land in agriculture is nonreproducible. Kautsky (1976) identifies the following properties of land: “(1) It is a non-producible good and in limited supply in the short-run (i.e., a given stock); (2) its quality (e.g., fertility) varies from plot to plot and is not transferable between them; (3) it is (geographically) location-specific, i.e., immovable; (4) it can be ‘pre-occupied’ by systems of private property, whether of peasant producers or of exploiting classes” (Adnan, 1984). Kautsky’s formulation also leads to better understanding of the process of capitalist transformation; since land is not simply geographical space, but fundamentally “production-space,” a capitalist development in agriculture is contingent upon subsuming land, assuming capitalist expansion requires the absorption of a contiguous farm-area as well as cooperant inputs, as opposed to industry, which can bypass the process (Adnan, 1984). Alternatively, the capitalist may use precapitalist methods such as lending on usurious terms to force the sale of land or use other means of primitive accumulation including land grabbing. As Brenner (1977) points out, the control of land results in tied command of complementary resources (means of subsistence including labor power) in a “nonmarket” way, with the power in the hands of the landowner to define the entry of a new form of production like capitalism (Hussain & Tribe, 1981). Kautsky’s argument applies to primitive accumulation (a condition of capitalist development) and to the accumulation of capital. On the persistence of smallholdings and the tardy growth of the land market, Kautsky negates the efficiency of smallholders and instead points to their power of endurance. He states: “If in spite of so much poverty, land sales are not more frequent, this is because our peasant, in order to preserve independence, knows how to endure an incredible amount of suffering. As long as smallholders do not plough their own fields but insist on work as day labourers, they are relatively well off” (Banaji, 1976).

Finally, the Marxian tradition has also had long-standing discussions and debates over the role of markets and other institutional conditions required for rapid productivity growth. There are three major debates: (a) The Dobb-Sweezy debate in the 1950s on the “transition from feudalism to capitalism” in Europe in the pages of *Science and Society* along with further materials is available in Dobb (1976); (b) the Brenner debate, initiated

by his article “Agrarian Class Structure and Economic Development in Pre-Industrial Europe” in the pages of *Past and Present* (1976) is available in Aston and Philpin (eds.) (1985); and (c) the debate on the “mode of production in Indian agriculture” in the pages of *Economic and Political Weekly* is available in Patnaik (1994). Sweezy (1976) posed a polemical question: What was the “prime mover” of the transition from feudalism to capitalism? For Sweezy, the removal of fetters constraining the growth of internal markets depended on the incorporation of the feudal society into systems of external markets, and the growth of long-distance trade played a key role in weakening feudalism and allowing capitalism to grow. For Dobb (1963, 1976), the process that began to remove obstacles to the market was a class struggle between lords and peasants internal to the feudal economy, which weakened the political ability of feudalism to restrict markets, allowing the growth of petty commodity production, which in turn grew into capitalism. If Dobb was right, why did class struggle of different types in other precapitalist societies not weaken internal restraints within those societies sufficient for petty commodity production to expand to the point that modern capitalism began to emerge? After all, feudalism was quite weak in many parts of the world that were fairly commercialized, including non-European areas like India, but capitalism did not emerge there. On the other hand, if Sweezy was right, why did commercialization and long-distance trade not act as a solvent that allowed capitalism to emerge in other trading areas, including China, India, and the Italian city-states like Florence or the Dutch Republic (Khan, 2008)?

Subsequently Brenner (1976, 1977) argued (which led to the Brenner debate) that the critical driver was not the growth of the market per se but rather the introduction of a new set of institutions and rights that have been collectively described as “capitalism,” which were in turn the outcomes of class struggles.

Bernstein has argued that, in today’s world, the classical agrarian question has lost its relevance. He distinguishes between an agrarian question of labor and an agrarian question of capital. As regards an agrarian question of labor, he argues that “generalized commodity production” already ruled in agriculture across the globe at the end of colonialism, and there are no longer any precapitalist agrarian classes to be the carriers of a transformation as precapitalist peasant and landlord classes have been, by now, almost universally transformed into capitalist farmers, petty commodity producers, and “classes of labor,” all existing within capitalist social relations (Bernstein, 1996). On the agrarian question of capital, he argues that national intersectoral linkages required between agriculture and industry in order for agrarian transition to contribute to the accumulation necessary for industrialization no longer exist. These linkages between agrarian capital and industrial capital, mediated by the state, which enable transfer of the surplus generated within agriculture toward industrial development, and commodity market linkages, creating dynamic interrelations between industrial and agricultural growth, including a home market for industrial products, no longer exist. He

brings the issue of globalization to substantiate that circuits of capital and commodities are no longer national but are “mediated by the effects of the circuits of international capital and world markets, for each sector in any capitalist economy (central or peripheral)” (Bernstein, 1996). Lerche (2013) points out that with neoliberal globalization, governments do not have the power to implement policies enabling national capital accumulation from agriculture to feed into industrial development. Moreover, most ruling classes would not even want to pursue such national intersectoral strategies, as their patterns of accumulation are also globalized, both for agriculture and industry, as opposed to what is assumed by the classical agrarian question model.

The preceding sections identify a number of elements that play a part in an analytical framework that confronts the transition in rural Bangladesh. This alternative, materialist framework has to address the issues of agrarian change and the dynamics of production, exchange, and power.

AN ALTERNATIVE CONCEPTUAL FRAMEWORK

The above discussion demonstrates the need for a theoretical framework that not only identifies the complex processes determining growth in agriculture, but also the transmitting institutions that mediate these processes and the effects of power, factional competition, and the state. The framework needs to capture the political settlement to investigate how political power affects market and nonmarket transfers, how such processes are driven by agents and groups, and how those processes create the conditions for systematic transitions in the organization of production.

The reviews above allow a classification of theories in terms of their prioritization of market or nonmarket processes of transition, and whether they presume that small farms are inherently more productive than larger farms (Table 1.1). The thesis of both neoclassical and neo-institutional economics is that an efficient market can drive efficient structural change, and that small farms are more efficient. These assumptions immediately imply the policy options that would accelerate market-enhancing institutional change. Neopopulists like GKI agree that small farms are more productive, but they suggest that nonmarket processes play an important role in the transition and therefore they support redistributive land reforms. The critique outlined above demonstrated the shortcomings of both positions and why these cannot be used as a framework for analyzing the accumulation and agrarian transition in Bangladesh, given the stylized facts and dynamics of the agrarian economy of Bangladesh.

The Marxist political economy approaches can be also classified into two strands in terms of their assumptions about the dominant process driving changes in the

TABLE 1.1 Classification of Theories

STRUCTURE	MARKETS CAN DRIVE EFFICIENT STRUCTURAL CHANGE	NONMARKET PROCESSES PLAY AN IMPORTANT ROLE IN DRIVING GROWTH-ENHANCING STRUCTURAL CHANGE
Optimal agrarian structure is small farms	Market-enhancing institutional change (Neoclassical and neo-institutional)	Redistributive land reform (Neopopulism)
Optimal structure requires land consolidation, scale economies, mechanization, etc.	Agrarian differentiation driven by markets (Lenin's thesis on Russia and numerous empirical studies)	Primitive accumulation, compulsion, driving transition (Marx, Brenner, Wood, Khan)

agrarian structure and the more productive structure that is required. The first strand, in Bangladesh as in many other countries, takes the Lenin thesis on agrarian differentiation through market processes and suggests that the market is driving the emergence of larger capitalist farms. The second strand draws on the Marxist understanding of primitive accumulation and takes political compulsions as a critical driver of structural change. Here nonmarket processes play an important role in driving such change. In both Marxist strands, small farms are not necessarily more efficient, and the very small farms observed in South Asian agriculture are definitely unsuitable for becoming capitalist farms on their own.

Analytical frameworks that draw exclusively on Lenin's differentiation thesis do not fit the stylized facts of Bangladesh, but in fact they also do not fit the transition facts in many advanced countries. First, in the classical capitalist transition in English agriculture, an important role was played by primitive accumulation, defined as the separation of labor from the land and the creation of an asset-owning class. It was only after these institutional facts were achieved by "nonmarket" processes that an agricultural sector emerged where assets and produce were sufficiently commoditized for creating compulsions on all sides for sustaining high productivity and production growth. But in late developers the forms of political and primitive accumulation and possibly the nature of technology is such that the existence of landless labor and an asset-owning class with marketized assets are insufficient for generating the compulsions for rapid growth in a classical Marxist sense. This is why in many empirical tests of the Lenin-Chayanov debate, the problem has been misspecified and the Chayanovian argument has found empirical support. Bhaduri et al. (1986) show the misspecification of data while van Schendel (1982) finds in favor of Chayanov.

The analytical framework of the study confronts the conceptualizations of neoclassical economics and its variants that the market can allocate land and other factors to

more efficient producers of commodity outputs (the general equilibrium analysis has been formalized in Arrow & Hahn, 1971). The proposed analytical framework gives importance to power relationships embedded in social formations as factors with important explanatory roles for understanding the operation of markets and the evolution of capitalism in agriculture.

The thesis contends that the nature of transition and the rise in productivity growth are contingent upon political settlement. Political settlement is defined as a combination of a social distribution of power with formal and informal institutions that is compatible and sustainable (Khan, 2010). The agricultural total factor productivity has witnessed a decline between 2006 and 2016 in countries in South and Southeast Asia (Liu et al., 2020). In developing countries, the distribution of power between organizations typically does not allow the enforcement of many formal institutions such as property rights that are modeled on more advanced countries. These institutions are informally modified or partially enforced to ensure that the distribution of benefits is in line with the actual distribution of power, and many organizations informally operate to ensure these outcomes in a society. For analytical clarity, this study sees society as an interlinked system consisting of economic, political, and social subsystems, linked at different levels such as local, national, and global. The societal subsystem describes the configuration of classes competing with each other in the political domain in order to maintain control over productive resources in the economic sphere. The political subsystem draws on societal subsystems as the governing class arrives at or imposes a set of collective goals. The economic subsystem actualizes the production of goods and services. In other words, the societal subsystem defines players, the political subsystem inscribes rules, and the economic subsystem describes the actual system of accumulation.

Political settlements in developing countries are described as clientelist because of the dominance of “personalized” or informal exercises of *power* in these countries. Khan (2010) distinguishes the term “clientelist” from existing usages in a number of ways. First, many standard explanations of personalized power in developing countries refer to primordial loyalties or deference supported by culture, the insecurity of the poor, or the absence of democracy (Barbone et al., 2006; Eisenstadt, 1973; Engerman & Sokoloff, 2002; Médard, 2002). Instead, his definition of a clientelist political settlement is a general definition that looks for a mismatch between existing distributions of holding power and the structure of formal institutions. He explains that the informality can incorporate a wide variety of exercises of power in developing countries that are responsible for the gap between the expected operation of formal rules and their actual operation. This is potentially an advantage because narrower explanations of personalized transactions cannot explain the general observation of some variant of personalized or nonformal power in *all* developing countries regardless of their political institutions, cultures, and social histories. The specific social, cultural, and economic

characteristics of societies, however, can of course explain important differences in the manifestations of personalized power. Second, the term “clientelist political settlement” is not described by him to assign any particular institutional structure or form of government or any specific set of outcomes.

The organization of politics along the lines of patron-client factions is a structural feature of developing countries because of economic and political characteristics of these societies, not related to traditional authority or the absence of democracy. This makes the current analysis of clientelism very different from the analysis of neopatrimonialism in the neo-Weberian tradition (Médard, 2002). But developing countries face significant structural imbalances between economic and political power. This is why patron-client politics plays a significant role in developing countries as a mechanism for managing redistributive demands in contexts where fiscal resources are insufficient and social democratic states are not feasible. Political stability is typically achieved through the allocation of resources to powerful political organizers operating patron-client networks (Khan, 2010). These structural features explain why the “Weberian states” of advanced countries are nowhere in evidence in the developing world.

This structural feature of patron-client engagement thrives upon primitive accumulation. This process of accumulation, Marx argued, was primarily a violent one largely carried out by the state. Most centrally, land enclosures forcibly deprived English peasants of direct access to the means of production, but for Marx primitive accumulation also encompassed colonialism and the African slave trade. Marx’s account is a powerful corrective to liberal narratives that see markets solely as spheres of voluntary, mutually beneficial exchange. Wood follows Brenner in arguing that market dependence can apply not just to capitalists and propertyless laborers, but also, under certain conditions, to agricultural producers in direct possession of land. If they must produce competitively in order to access the inputs, they need to reproduce themselves—if their “access to the means of subsistence [is] dependent on the market”—they have come under the sway of capitalist imperatives (Wood, 2002a). With respect to primitive accumulation, Wood argues that while, for Marx, “the real ‘primitive accumulation’” involved “the expropriation of the agricultural producer,” what made this significant was not only the “concentration of wealth in the hands of larger proprietors,” but more profoundly “a transformation of social property relations that set in train new imperatives of competition and accumulation” involving “the imposition of market imperatives.” Wood’s definitions of primitive accumulation and capitalism thus correspond: Capitalism means market dependence, and primitive accumulation creates it.

Since bargaining power is greater when the faction is bigger, there is a strong incentive for coalitions of factions to start coalescing in a pyramidal fashion. The more serious the conflict, the bigger the coalition that will form to fight it, with the payoffs from victory being distributed in varying proportions down the pyramid. Success in redistributive contests depends on each faction being able to field more organizational

holding power than its rivals. This is as true of the lowest level factions fighting over disputed land in villages as of national-level factions competing for control of the state. The payoffs targeted by a faction depend on the economy and the dominant types of rents that political power can be used to allocate through formal and informal mechanisms. These ensure primitive accumulation.

It is also important to understand the role of the state here in transition toward capitalism and the role of primitive accumulation. Wood (2002a) articulates that capitalist social relations cannot exist without a state that enforces the rules of the game, and the state acts as a political “superstructure” floating above the economic “base.” Wood argues forcefully that globalization involves the generalization of the capitalist state form. She also recognizes that an account of primitive accumulation requires an account of state formation. Before her, Karl Polanyi (1957) showed that the bringing into being of a “market society” ironically requires the creation of a powerful new type of state that can profoundly restructure social relations.

The transition toward capitalism also requires a comprehension of property rights and political settlement. The theory of property rights, based on the work of Coase, Barzel, North, and others in the new institutional economics tradition, says that property rights make contracting easy and thereby reduce market failures (Barzel, 1989; Coase, 1960; North, 1990, 1995). Such theory suggests that the property rights problem in developing countries is essentially one of incomplete or weak implementation of property rights. This is an excessively limited view.

The relevant difference with this line of theorization of property rights is that strengthening the protection of any existing property rights will not always enhance growth, warranting the role of nonmarket transactions beyond the traditional importance given to eminent domain interventions. Most importantly, this does not make explicit the “political” nature of the most significant costs of creating, altering, or destroying rights; rather, the concept of transition costs focuses on the political determinants of the potentially intense costs that can determine whether changes in property rights along a particular dimension are feasible or not. The political settlement, on the other hand, describes the relative power of relevant groups and classes in a society. This settlement is relevant for an analysis of property rights transitions because the relative power of gainers and losers and the ability of the state to absorb the resistance of losers are important determinants of the likelihood of particular rights being created or destroyed.

Elements of a Framework

The alternative approach contrasts with the orthodoxy that claims development can be accelerated with the removal of obstacles to a competitive market. The rural economy is characterized by markets operating among a variety of *differentiated* producers with diverse capabilities and options. The analysis of transition will have to address a

differentiated structure of production and exchange relationships, with unequal power relations embedded in a complex array of noneconomic relations affecting the operation of both market and nonmarket processes affecting transition. Here, social property relations is the theoretical and methodological point of departure for this study. “Social property relations” is a generic term that goes back to classical political economy. Brenner (1986, p. 58) defines the relationships among the direct producers, among the class of exploiters (if any exists), and between the exploiters and producers, which specify and determine the regular and systematic access of the individual economic actors (or families) to the means of production *and* to the economic product. In every social economy, such property relations will exist, and make it possible for the direct producers and exploiters (if any) to continue to maintain themselves as they were — i.e., in the class position they already held, as producers and exploiters. But more to the point, these property relations, once established, will determine the economic course of action which is rational for the direct producers and the exploiters. (*italics in the original*)

The Propositions

This study develops a number of important propositions. First, the study breaks with the market-centric view of transition since history shows that the emergence of a dynamic capitalism is associated with the *imposition of new structures of rights and institutions* that compelled productivity growth. Dynamism requires a structure of rights and institutions such that both capitalists and workers are compelled to engage in a continuous improvement of productivity in order to survive (Brenner, 1976, 1985; Wood, 2002a). In this view, the deeply rooted mainstream assumption of “market as a provider of opportunities” as a driver of growth is substituted by the *imperatives* of “competition, and profit maximisation, a *compulsion* to reinvest surpluses, and a systematic and relentless *need* to improve labour-productivity and develop the forces of production” (*italics in the original*; Wood, 2002a).

Second, the study posits that transitions involve significant nonmarket transfers of assets in the form of *primitive accumulation*. The property rights underpinning capitalism are typically achieved at least partly through nonmarket processes described by Marx as primitive accumulation. These nonmarket transfers “employ the power of the state, the concentrated and organised force of society, to hasten, as in a hothouse, the process of transformation of the feudal mode of production into the capitalist mode, and to shorten the transition” (Marx, 1979). The conditions under which primitive accumulation leads to the emergence of a viable capitalism are still inadequately theorized. As Habib (1995) points out, there is no guarantee that an efficient capitalism will eventually emerge, despite primitive accumulation involving huge injustices and social waste. The dynamics of primitive accumulation are primarily driven, and at the

same time constrained, by political forces. The task of political economy is to explain why this politically driven process results in “churning” in contexts such as Bangladesh, rather than in a concentration of land, and also to investigate the implications of this analysis for social and economic policy.

Third, technology, in the neoclassical tradition, is a given or a residual, fully defined by its physical attributes and immutable under different social relations. Instead, the study sees productive forces as involving *socially embodied technology*. Productivity is not only a function of technology embodied in capital equipment but also depends critically on social institutions that impose compulsions for achieving that productivity.

Finally, the transition is therefore specific to a *political settlement* and is not just the expansion of markets. This calls for an exploration of the interface of institutions and political organizations, mediated by the historical evolution of class and factional power. The functioning of the economic game at the microeconomic level rests on, and is reinforced by, the nature of *property rights*, which are not only an incentive structure, as claimed by mainstream economists, but are also underwritten by *power relations*, a consideration of which is a departure from neoclassical and most neo-institutional approaches. For example, processes of power, especially in landed property, may lead to the dynamic instability of property rights. A further variable is therefore the *institutional reality of the state*, which is neglected in mainstream analysis that often suggests that agrarian transformation can be achieved through a series of technocratic institutional reforms, such as sorting out inconsistencies in land records and improving the efficiency of the court systems. This leads to an investigation of the political basis of the state and the processes of rent, rent-seeking, and rent distribution as embedded in a given political system. Other associated themes that merit inquiry relate to global capitalism, the responses of nation states, and the politics of international and bilateral financial institutions and transnational corporations.

The Core

The economic structure is understood as a description of the material requirements of production, constituted by the relations of production. Marx writes (1968): “In the social production of their life, men enter into definite relations that are indispensable and independent of their will, relations of production which correspond to a definite stage of development of their material productive forces. The sum total of these relations of production constitutes the economic structure of society. . . . The mode of production of material life conditions the social, political and intellectual life process in general.”

Marx (1967) again writes that “whatever the social form of production, labourers and means of production always remain factors of it.” Marx (1977) demonstrates that “capital comes dripping from head to toe, from every pore, with blood and dirt,” in

contrast to Adam Smith, who states that economic development progresses through the voluntary acts of the participants. These insights help to formulate a simple schema of the “social organization of production” in an interdependent and intertwined linkage of *agents* and *means* of production, mediated by market and nonmarket *institutions* (Figure 1.1).

Agents

The simple framework, which is sketched for illustrative purpose (Figure 1.1), does not include all the varieties of agents that exist in contemporary rural Bangladesh. The term *agent* has been differently used in literature. For example, Patnaik (1987) differentiates in terms of labor use classes: landlord, rich peasant, middle peasant, small peasant, poor peasant, and landless laborer. The Bardhan-Roemer labor use schema is based on hiring categories (Bardhan, 1984; Roemer, 1982). Bharadwaj (1989) states classifications based on such “exploitation criteria” and income-based groupings raise many questions pertaining to the region-and-period specific suitability and classifies in terms of four categories: chronically deficit households, small cultivators, households with a sizable surplus responding to market stimuli, and households with substantial surpluses whose reinvesting behavior and marketing decision affect terms of exchange. These categories leave considerable discretion for analysts.

With respect to understanding agrarian change, it is necessary for the purpose of a study that concentrates on land transactions to identify agents in terms of dif-

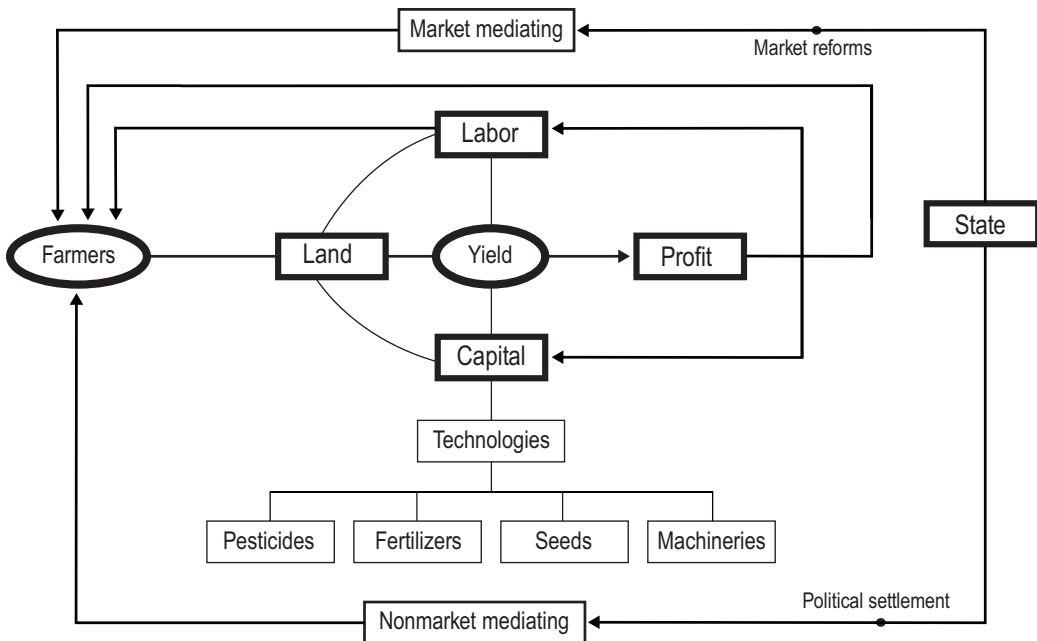


Figure 1.1 Social dimension of production.

ferences in their behaviors related to (a) land transactions, (b) the use of land, and (c) productivity.

Agent behavior is described by market and nonmarket transactions in all forms including buying, selling, leasing, and renting. It is imperative to look into the transaction to find out whether there is any tendency toward the emergence of a productive class of “capitalist” farmers and whether repeated transfers of land across landholding sizes have any significant effect on the final landholding structure.

Antecedent Agents

The *state* has increasingly played a central role—economic and noneconomic—in influencing the process of accumulation as well as retarding or speeding up capitalist development. The state, in its noneconomic role, is engaged in the structural reproduction of the system needed for agents to continue surplus appropriations through the enforcement of the relevant property relations and the legitimization of economic inequalities. The state is heavily engaged in appropriating and disbursing surplus through fiscal and monetary policies. The *international agencies*, including the World Bank, the International Monetary Fund (IMF), and the World Trade Organization (WTO), and bilateral donors also play a role in the determination and enforcement of parts of the institutional structure. In this age of globalization, decisions affecting a country’s policies are frequently made beyond its borders. Divisions between national and international forces have increasingly become meaningless. The World Bank, IMF, and WTO have been setting the parameters for development policies in poor countries for over five decades, despite the recent shift in rhetoric toward increasing country ownership of policy. Much of the current agricultural and rural development policies in Bangladesh have their origins outside the country. Harrison states that in the developing world there exists no distinction between the donor and the state: “The national-international boundary has been rendered so . . . porous by a historically embedded ‘mutual assimilation’ of donor and state power” that “rather than conceptualising donor power as a strong external force on the state, it would be more useful to conceive of donors as *part of the state itself*” (2001, pp. 661, 669). The dominance of the public policy arena by a narrow corps of transnational development professionals thus occludes the possibility of deepening democratic oversight of measures for national development. At the same time, the sites and structures of policy implementation are overseen by a *de facto* single-party political establishment (most of the political parties in the developing world share the single vision of neoliberalism) driven by clientelist relations and procedures.

Of late, the donors have reinvented *civil society* as well as an emphasis on service delivery NGOs. This shift in the opportunities of actors outside the narrow political elite to participate in policy formulation is hailed on several fronts as a major breakthrough

in opening up policy processes to civic oversight. Looking more closely at the emerging structures and relationships of consultation and participation, however, suggests more limited changes. There have been some “new” contractors and providers of services in developing countries whereby some public goods are provided by service delivery NGOs. But terming this a sea change in terms of ownership of policy is an exaggeration.

In countries ruled by intermediate classes like Bangladesh, the political space has been used to promote the interests of multiclass political *factions*. This process has been described as clientelist politics. It is therefore also necessary to identify how factional politics operates in particular countries, and how their impact on market and nonmarket processes can contribute to the processes of transformation affecting productivity growth in agriculture.

Means

An important question is how the differentiated ownership of the means of production is transmitted in productive activities through exchange operations. The tracking of these processes can help identify the reasons for the acceleration (or stagnation) of the growth in the productive capacity of the economy. This requires, for the current study, a dialectical understanding of the supply of, and demand for, land through processes of accumulation. It is also of importance to understand the processes of production and interlinked responses to exchange systems in the output, credit, and labor markets. Given the observed production and exchange processes, the focus of the inquiry is on the investment behavior of farmers. The effects of external intervention (e.g., the state) on transfers of the means of production are also analyzed in order to track the effects on the process of accumulation and transition.

Market-Mediated Institutions

Exchange relations are described in terms of a hierarchical structure affecting output, land, credit, and labor as the most important markets, since the dominant parties set the pattern as well as the terms and conditions of exchange (Bharadwaj, 1989).

What is important here is to investigate the *feasibility* of a market-centric view that the removal of obstacles would break the foundations of arrested growth. Alternatively, this requires inquiring into the implications of market transactions in a given particular hierarchical structure. For instance, there may be resistance to land transfers through a purely market process coming from an “irrationally” high reservation price of land set by marginal farmers who face high uncertainty in alternative occupations. Therefore, if a more productive agent is trying to buy land, the existing tenant need not sell at a price slightly higher than the current value of their return based on their

existing productivity. Instead, they may hold out for a significant share of the extra income that the new investor can generate. This problem can become more serious with a very fragmented land structure where many individuals could potentially veto the acquisition of contiguous land.

Nonmarket Mediating Institutions

These are crucial since they also affect the operation of markets. The neoclassical paradigm and the policies derived from it view the economy as being defined by market activities, and if the market does not mediate production and distribution, the analysis proceeds on the assumption “as if markets existed,” reducing nonmarket activities to “market equivalents” (Adnan, 1984). There are at least two dimensions of nonmarket processes that are relevant here, primitive *accumulation* and the operation of the *political settlement*, which are interlinked and affect the process of growth. To underscore his distance from Smith, Marx prefixed the pejorative “so-called” to the title of the final part of the first volume of *Capital*, which he devoted to the study of primitive accumulation. In so doing, Marx dismisses Smith’s “previous” accumulation in order to call attention to the actual historical experience. In contrast to the “so-called” primitive accumulation, Marx analyzed in detail the brutality of the actual process of separating people from their means of production in an effort to lay bare the origin of the capitalist system. Contrary to some commentators associating “primitive accumulation” with that of precapitalist relations, it is deeply associated with capitalism. Amin (1974) states that the mechanisms of primitive accumulation “do not belong only to the pre-history of capitalism, and they are contemporary as well.”

The process of primitive accumulation brings to the fore the importance of the *political settlement*, which is the distribution of power across relevant organizations, in this case, the organizations involved in or affected by primitive accumulation (Khan, 1995). The political settlement is thus a shorthand expression for the distribution of power within society, including the effects of international linkages through the process of globalization, and these power relationships often manifest themselves through the formal and informal processes of the state and politics. The state, constituted and expressed through political relations, is an increasingly significant vehicle of economic reproduction. The distribution of power described by the political settlement is important for understanding why some patterns of nonmarket allocation can or cannot be enforced. Contrary to the view of the state as an autonomous entity from the economy, the state is linked to the economy through its engagement in the processes of rent-creation, rent allocation, and primitive accumulation. The state affects the distribution of rents and assets through taxation, public expenditures, the regulation of accumulation, interest and exchange rate policies, and so on, and the pattern and enforcement of each of these

reflects the relevant political settlement. The pursuit of self-interest by individuals cannot explain many aspects of the functioning of markets and society. The configuration of power is a critical variable determining the pace and direction of the agrarian transition that in turn explains long-term productivity growth.

The relationship between power and the accumulation of land is not necessarily a simple one. Power can be divided, for the purposes of this study, into two sources: (a) economic power based on the ownership of assets, and (b) organizational power based on the ability to mobilize. Individuals and organizations that are more powerful will be more likely to hold out longer in conflicts with other individuals and organizations over rents and assets, and therefore, will be more likely to win. But this does not ensure productive accumulation because the more powerful organizations may not necessarily have the incentives or compulsion to use the rents or assets they capture in productive ways.

International agencies including the World Bank, the IMF, the WTO, and bilateral donors also influence the formulation and conduct of economic policy. Their ability to do so reflects the global political settlement and the relative power of domestic and international organizations. The global inequality of endowments and entitlements creates particular symbiotic relationships between local aid recipients and the global organizations providing aid, and the latter acquire the formal or informal right to influence policies and institutions in the countries receiving aid. These international linkages and rent flows create another source of potential constraints for productivity-enhancing transformations. The intermediate classes ruling developing countries are often the beneficiaries if not actually the products of specific aid regimes. Their strategies of accumulation can be significantly affected by the aid strategies affecting the country, and the “ruling classes” in these countries can easily engage in accumulation strategies that are not politically stable or economically productive.

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RURAL DYNAMICS AND AGRARIAN CHANGE

INTRODUCTION

In Tamale, Ghana, combined forces of rapid urbanization, population pressure, and the infrastructural, industrial, and governmental needs of a rapidly growing city posed negative implications for agriculture and the communities dependent on agriculture for livelihood. Agricultural lands were encroached on to accommodate industries, urbanization, and growing settlements, leading to a breakdown of the customary land tenure system in Ghana, where members of families had collective ownership of land. However, due to increasing demand for land resources, landowners were compelled to shift the definition of boundaries. Simultaneously, more and more prime agricultural lands were converted to serve more profitable uses, thereby adversely impacting the poor farming communities in Tamale (Naab et al., 2013).

Agricultural practices in Iran are vulnerable to climate change impacts in the form of changes in precipitation, temperature, and carbon dioxide fertilization. In the absence of effective adaptation measures, these may bear significant adverse impacts on crop yield, irrigation requirements, and the income of farming communities. The government's current efforts center around advancing technology and changes in the institutional environment, coupled by farmer responses of diversification of livelihood strategies, crop variations, and increased investment in irrigation infrastructure and water-saving technologies (Karimi et al., 2017). Climate change also plays a significant role in determining the pathway of agrarian transition in a country through its impacts on agricultural productivity and adaptive responses. Therefore, this chapter selected stories from representative farming communities from a developing country that comprises all the forces—population pressure, urbanization, and climate change—that mold the pathway of agrarian transition.

Internal migration in China is made up of “rural migrant labor,” which refers to a specific group of industry and service sector workers with the rural *hukou* or the household registration system. These migrant laborers, despite their employment in urban

areas, are regarded as “rural” and therefore deprived of urban welfare benefits. As a result, the rural migrant workers rely on subsistence wages that give them a very minimal living, and they are regarded as the “new and true urban poor.” In 2008, the global financial crisis led to a mass exodus of these rural migrant workers to their villages, as global demand for Chinese exports plummeted, leaving a large population of subsistence wage earners in precarity (Chan, 2010).

The chapter sets the scene on the dynamics of contemporary agrarian transition, based upon the data collected from field surveys of four villages in a developing country, selected on the grounds of having a relatively large population in proportion to land area available, which is the case in Bangladesh. The village-wise sections identify broader trends to depict the nature of accumulation. Each section starts by looking at the demographic dynamics, goes on to show the trends in land relations in these villages, and makes comparisons between the data of the national average vis-à-vis the census done for the study. Two subsections are devoted to capturing the accumulation process through analyzing the census data on production, exchange, and technological processes. The final part of these village-wise sections explores the collected data in relation to land transactions, decisions regarding transactions, and consequential associations with power, politics, and the state. The chapter therefore serves as the ethnographic and qualitative side to the triangulation method discussed earlier.

These representative villages in Bangladesh were chosen on the basis of the stylized facts emerging out of Bangladesh in recent years in consonance with the objectives of the study. First, the Bangladesh economy has witnessed a major share of its gross national output being contributed by the remittance received from Bangladeshi migrants, the majority of them coming from rural areas. Second, there has been an increased utilization of modern technology, including highly intensive use of modern seeds, chemical fertilizers, irrigation, and pesticides. This has been accompanied by changes in cropping patterns, with higher cropping intensity in certain parts of the country. Third, Bangladesh faces high risks of natural and man-made calamities, with constantly changing geographic and geomorphologic situations. The frequencies of natural disasters including high tidal bores, tornadoes, floods, cyclones, and riverbank erosions, multiplied by the changes in climate, have swelled in recent years. A good number of households in Bangladesh are, therefore, internally displaced and move from one place to another. Fourth, there has been an enlargement of communication networks as a result of huge investment in the transportation sector, as the share of construction in GDP has picked up manifold, improving connectivity and lowering some transaction costs. Such investment in connectivity and mobility has been a major factor in the so-called closing of the urban-rural divide. Fifth, there are still remote and backward areas that experience low yields, and land markets in these areas are also characterized by sharecropping instead of the dominant rental markets. Sixth, Bangladesh is still home to primitive accumulation as well as extractive capitalism, as part of a process that sometimes has global

linkages; for instance, the powerful grab lands to produce crops for international markets (e.g., shrimp). Efforts were made to reflect such strands in the choice of villages so that the research remains as nationally representative as possible.

VILLAGE I: THE VILLAGE BETWEEN TWO CITIES

Srimantapur is a village in the Comilla district, which lies to the east of Dhaka, the capital city of Bangladesh, and closely borders the Indian state of Tripura. Srimantapur is close to the bustling small town of Chandina, which is situated just by the main road from Dhaka to Comilla, roughly half an hour's drive from the town of Comilla. With regard to agriculture, the village is well known for being part of the *Comilla model*, launched in 1953 in East and West Pakistan with technical assistance from the government of the United States. The Comilla model was a rural development program by the Pakistan Academy for Rural Development (renamed in 1971 the Bangladesh Academy for Rural Development), located on the outskirts of the town of Comilla and initiated by its founding director, Akhter Hameed Khan. The management of the cooperative was dominated by relatively large farmers and the benefits were largely concentrated in the hands of the rich and the powerful (Khan, 1979).

In this village, farmers enjoy a relatively high level of agricultural productivity with intensified use of modern technology, together with fertile land and a higher degree of crop intensity. The higher level of productivity of this village when compared to other studied villages can be attributed to a number of important factors.

First, farmers in this village, unlike in some other areas, are well connected to output markets, both in the more immediate and surrounding areas. Accessibility to the town also brings with it greater exchange opportunities. Very close to Chandina is the Nimsar market, one of the largest wholesale produce markets in Bangladesh. Producers here can sell their goods either to middlemen or directly to big buyers who come from Dhaka and Comilla.

Second, the village is also distinguished by an absence of flooding during and after the monsoon and is not prone to the natural disasters that plague some other regions of the country. With respect to climate, topography, irrigation facilities, and accessibility, the village is one of the most favorable locations in Bangladesh for agriculture. Much of the land is high, as opposed to the low land that characterizes a significant part of the country where mainly paddy can be grown (*Aman* or *Boro*, depending on the time of the year). Farmers have a much wider range of choices regarding the crops they can grow. Thus, many farmers are also diversifying into other crops including vegetables or potatoes or other cash crops for selling in the market, in addition to rice, enjoying a marketable surplus.

Third, yields are high, but farmers have begun to experience a plateau in productivity as soil fertility has been gradually reducing due to intensified agriculture, particularly owing to higher use of chemical inputs to retain the similar or higher level of output. Most of the land is triple cropped, yet a significant portion of those farmers grow as many as four crops per year.

Fourth, plots are smaller on average in this village, as is evidenced by the estimation of the amount of land in use gradually declining from the acres or *pakhis* of the elder generations to the decimals, *gondas*, and *bighas* due to subsequent fragmentation. Much more intricate land measurement systems exist in Bangladesh precisely because the amount of land per person is very low. Although measurements vary depending on the region, rough estimates of English measurements are as follows: 1 acre = 100 decimals, 33 decimals = 1 *bigha*, 6 decimals = 1 *gonda*. The incidence of fragmentation is high in this village compared to other studied villages. The emerging paradox is that the degree of fragmentation is high in areas where the productivity is very high.

Fifth, a major complaint is the sporadic availability of land for purchase, though there is transaction of lands through leasing and renting. Large landowners commonly lease out their land to smallholders or landless farmers since members of such families live in cities or are engaged in other lucrative options including off-farm employment or business activities. In this area, unlike in others, it is also common for large landowners to dedicate their full energies to the land they hold, eking out of it as much productivity as can be generated due to higher returns. Villagers identified that one of the key differences between these two types of large landholders was educational attainment—those with relatively advanced education were more likely to lease out or sharecrop their land whereas the less educated or uneducated were left with the option of remaining “pure farmers.”

Demographic Characteristics

The population growth rate in Comilla is substantially lower than that in the rest of Bangladesh but increased to 1.58 in 2011, the latest year of the national census, from 1.32 in 2001 (Bangladesh Bureau of Statistics [BBS], 2011). This may be linked to the population’s so-called “advanced” status. The people are generally better off than most Bangladeshis and are involved in a range of economic activities, including a high productive agriculture compared to other areas. The crude birth rate in the country is 18.3, but the rate is 22.6 in Comilla (BBS, 2018). The crude birth rate, which measures the number of childbirths in a demarcated area per thousand population, seems to be more than the national average in Comilla.

Yet what is discernible is that the population density is substantially higher than the national average. Population density increased by 14.9% between 2001 and 2011. Population density per sq. km in Comilla was 1,712 in 2011, whereas the national rate

of density was 964 (BBS, 2011). Accordingly, fragmentation is cited, as it is in other villages, as the number one problem confronting the village with regard to land ownership. The land mass is scarce and is continuously being divided and subdivided as the numbers of families expand.

This population growth and fragmentation has created a compulsion to be hyper productive. Many villagers said, “Farmers here don’t let their land rest for even a moment.” In all categories of landholding size, farmers are rotating three or four crop cycles every year. Total cultivable land in the district is 444,132 acres, of which single cropped land is 18.05%, double cropped 63.99%, and triple cropped 17.96% (BBS, 2011). This generally surpasses the average cropping intensity of Bangladesh. The physical environment also allows for the conditions that enable farmers to cultivate a variety of crops, foremost among them being paddy, along with a variety of vegetables and potatoes. These trends are captured in the following subsections.

Land Relations

The village-level census finds that there is a distinction between the ownership of land and the use of land for cultivation. Smallholders own half an acre on an average but cultivate just over one acre (Table 2.1). Medium-size farmers lease in a bit over double the quantity of land they own. The scenario is otherwise in the case of large landowners, and they lease out to the small and medium farmers. The peculiarity here is that the rate of leasing out is lower in comparison to other studied areas due to higher returns from self-cultivation. What is, however, discernible is that the concentration of land for cultivation is with the medium farmers in this particular area; because of the high input cost to maintain the level of productivity, smallholders find it difficult to arrange the funds. The access to inputs also requires either possession of a certain degree of influence or links with the powerful as in certain contexts these are available under restricted arrangements (e.g., fertilizer in certain circumstances is distributed through a government mechanism).

Another noticeable phenomenon in this part of the country is that of growing landlessness, compared to other studied areas, which evinces the ostensible relationship with Lenin’s thesis of agrarian transition with the penetration of capitalism. Yet, it is

TABLE 2.1 Average Land Held per Household (acres)

	TOTAL LAND OWNED	CULTIVATED LAND
SMALLHOLDERS	0.50	1.02
MEDIUM FARMERS	1.92	4.05
LARGE FARMERS	10.18	7.53

Source: Field survey.

important to keep in mind that while the level of landlessness here seems rather high, many of these people lease in land or sharecrop. With regard to landholding, this picture at the village level aligns quite closely with the situation recorded by the national agriculture census at the district level.

The quantity of land available for ownership and cultivation also decreased substantially between 1983 and 1996 as shown in Table 2.2. Due to its proximity to the city and being relatively well connected with the capital, many industries, including poultry farms, are finding their way into Comilla. These industries are capturing farming land, resulting in the total cultivated area decreasing over the years. On the other hand, considering the growth in population in the area, fragmentation of land seems omnipresent.

There has been an increase of smallholders and share of the ownership of land during the period between 1995 and 2005 while the number of medium and large farmers has decreased (Tables 2.3 and 2.4). The nationwide share of nonfarm households has increased from 33.82% in 1995 to 46.43% in 2005. The share of increase for Comilla remains relatively less than the national average due to increasing returns from agriculture. The share of smallholdings in Comilla has increased at a faster pace, both in terms of number of households and ownership of land, than the national average.

A similar pattern is observed from the census conducted in the village. Most of the landowning population are marginal or smallholders (Table 2.5). Plots are smaller on average in this village compared to others, as is evidenced by their use of decimals, *gon-das*, and *bighas* to measure their land, as opposed to acres or *pakhis*.

The census data also suggest a major change of deepening on the leasing in of land (29.2% for smallholdings and 9.6% for medium farmers) and mortgages (16.8% in cases of smallholdings), while the percentage of land sharecropped has significantly gone down to 0.8% (Table 2.5). This is a major indicator in terms of compulsions for productivity as leasing of the land is now transacted on a predetermined price with neither sharing of cost of inputs nor supervision of the land by the owner of the land, while sharecropping entails provision of inputs by both the parties. Lessees are thus faced with the compulsion to grow produce at a level that meets the compulsions of both the parties. Such compulsions in the long run turn out to be unsustainable as lessees have one objective, higher yield at any price, which compels them to use chemicals at higher rates and intensity, resulting in observed decline in soil productivity.

The push has led to a major problem of overlapping debt. Smallholders, for example, borrow money from larger farmers in order to facilitate an investment of some sort. When harvests collapse or if competing demands are made on the household earnings, smallholders are forced to borrow from local NGOs/MFIs in order to repay the local moneylenders or vice-versa. Despite the interest rates being higher with local moneylenders, their repayment schedules are much less flexible and the conditions stricter than those of NGOs.

TABLE 2.2 Per Capita Cultivated Area of Farm Household (acres)

	1983-84			1996		
	CULTIVATED AREA	PER HOLDING	PER CAPITA CULTIVABLE AREA	CULTIVATED AREA	PER HOLDING	PER CAPITA CULTIVABLE AREA
BANGLADESH	17,448,000	2.00	0.25	17,771,339	1.50	0.14
COMILLA	568,074	1.27	0.14	491,359	1.02	0.10

Source: BBS (1999).

TABLE 2.3 Number of Households by Type of Farms in 1996 and 2005

	TOTAL HH	NONFARM HH	% OF TOTAL (NON-FARM)	FARM HOUSEHOLDS				
				% OF TOTAL	SMALL	MEDIUM	LARGE	
1996								
BANGLADESH	17,828,187	6,029,945	33.82	11,798,242	66.18	79.87	17.61	2.52
COMILLA	672,620	190,135	28.26	482,485	71.73	64.76	6.66	0.32
2005								
BANGLADESH	28,165,700	13,077,000	46.43	15,089,087	53.57	49.85	10.34	1.17
COMILLA	875,392	313,427	35.80	561,965	64.20	51.90	3.63	0.11

Source: BBS (1999) and (2010).

TABLE 2.4 Owned Area by Class of Holding—1996 and 2005

	ALL (FARM AND NONFARM)	NONFARM	FARM HOUSEHOLDS			
			TOTAL	SMALL (%)	MEDIUM (%)	LARGE (%)
1996						
BANGLADESH	20,333,332	4,473,333	15,859,999	40.34	36.87	16.36
COMILLA	596,627	43,889	552,738	65.90	29.87	4.22
2005						
BANGLADESH	28,165,700	13,077,000	15,088,700	38.30	25.8	9.38
COMILLA	875,392	313,427	593,848	54.29	13.12	1.22

Source: BBS (1999) and (2010).

TABLE 2.5 Srimantapur—Pattern of Distribution of Land Ownership

LAND OWNERSHIP GROUP	% OF HOUSEHOLD	% OF LAND OWNED	% OF OWNED LAND—				
			% OF CULTIVATED LAND LEASED IN	% OF SHARE MORTGAGE IN	% OF OWNED LAND SHARE-CROPPED	% OF CULTIVATED LAND <i>KHAS</i>	% OF OWNED LAND, MORE THAN ONE
Own only homestead land or landless (0–.04)	45.82						
0.05–2.49 acres	36.88	36.8	29.2	16.8	0.8	—	16.4
2.50–7.49 acres	7.62	51.9	9.6	—	—	—	38.5
7.50 and above	0.14	—	—	—	—	—	100.0

Source: Field survey.

Production Process

The production process is dominated by the extensive use of seed, water, and technology. Hybrid seeds have been in use since the early 1980s, and that has coincided with the early liberalization efforts described in the previous chapter. Most farmers buy seeds from the nearby town of Chandina. One of the largest NGOs in the world, having a presence all over Bangladesh, is one of the first providers of hybrid seeds. Fields are irrigated by deep and shallow tube wells, a number of which are also cooperatively owned. The use of chemical fertilizer is widespread and has been on the rise per unit of land over time. The villagers testify that use of fertilizers has at least doubled in the past 10 years as land has become degraded from crop intensification and use of chemical inputs.

Agricultural inputs and technology are used widely and extensively, especially by marginal farmers and smallholders. Medium farmers are more likely to own irrigation equipment, but small and marginal farmers also own equipment privately or in cooperation with other farmers. Although it is more common that deep tube wells are cooperatively owned, most of the irrigation machinery is more often privately owned and rented out. Shallow tube wells are also hired through costs determined by the meter, based on the electricity consumed in the irrigation process. Other machinery is mainly privately owned and hired out normally by entrepreneurial smallholders as a side business. Tractors began replacing the use of bullocks roughly 30 years ago.

Many farmers are second-generation chemical fertilizer users, and almost the entire community has turned to the use of this input instead of traditional manure (primarily

cow dung). The constant increase in use of fertilizer, without a similar increased output, suggests the declining fertility of the soil.

The population growth and consequent fragmentation of land have also compelled the use of modern technology to harvest output for subsistence and sale in the market to buy other necessities. In all categories of landholding size, farmers are found to be using technology, with many rotating three or four crop cycles every year.

Exchange Process

A large portion of the income out of the farms relates to the fact that many farmers have had relative success in diversifying their income-generation activities. A large number of farmers are producing potatoes, tomatoes, pumpkins, and fish in addition to rice for selling in the local market. They cannot afford to leave the land fallow.

One way that farmers can recoup more from their production is by keeping certain yields in cold storage until the market improves for a given crop. Cold storages, like the local rice mills, are owned by the intermediaries who, in turn, take a significant share of farmers' profits for the service. Since transportation systems are better in this area, farmers can also have access to market easily and thus undercut the role of middlemen who may have better advantages in other areas due to relatively inferior connectivity. The intermediaries, however, play a role as they are drawn to the area due to higher acreage. They mainly deal with smallholders with low income, lower capability of hiring additional labor beyond family members, and so busy with their production cycles that they do not have time to haul their harvests to market or to rice mills.

Large farmers are either involved in other businesses and/or have family members who have migrated to towns and/or abroad and send remittances to their families regularly.

Land Transactions and the State, Power, and Politics

Households that suffer from any one or combinations of troubles such as illness, providing a dowry, wrong investments, loans are forced to sell their greatest store of value—their land. Farmers are also impelled or compelled to sell their land in order to facilitate an almost equally or more valuable investment—sending family members abroad. This decision is taken with the expectation that the revenues it will generate will eventually be enough to buy back the same land or purchase a different parcel. Indeed, most people purchasing land in the village are using remittances sent by relatives living either in cities or abroad. Villagers report that people are buying and selling land mostly within the village. There are not a lot of outsiders coming in to buy land in this area (Table 2.6).

TABLE 2.6 Comilla—Reasons for Selling Land

REASONS FOR SALE	NONFARM HOLDERS (%)	SMALLHOLDERS (%)
Family expenditure	45.6	36.8
Marriage of daughter	10.3	20.6
Cost of migration	16.2	22.1
Medical expenditure	7.4	7.4
Land distribution to others	7.4	2.9
Other	13.2	10.3

Source: Field survey.

Note: Family expenditure refers to meeting expenses in running a family, and selling land on account of this usually occurs due to the deficit between income and expenditure and repayment of debts.

Power based on land ownership is a common phenomenon in rural Bangladesh including the village under consideration. The more land farmers have, the more powerful they become. For example, *A* and *B* might have already decided on a price and are about to go ahead; then *C* (a powerful man) comes along since he knows there is land for sale and wants it. *C* may actually offer even less to the seller, but the seller sells to him anyway, thus breaching the contract that was already verbally agreed upon. Often, however, *C* may offer more, and the seller may choose this option for obvious reasons. People are observed to be powerful because of their family and/or social networks (e.g., having 10 brothers makes you more powerful), sometimes because they are rich, while the predominant source of power is being part of, and/or networking with, political factions (Figure 2.1).

Although outright land grabbing is not so common in this village due to the higher number of relatives residing in cities with access and connections to politically and administratively powerful persons, small and incremental land grabbing is occurring between neighboring plots—larger landowners slowly encroach upon the land of neighboring smallholders. They say that in Chandina 30–40% of people are purchasing land using power, with the blessing of two major parties. The display of such power is transient, and the allegiance rotates to side with the party in power, except for a few well-known faces. They also report covert liaisons between the partisans of two dominant organizations to mutually benefit from the process.

Summary: Srimantapur, Comilla

The village of Srimantapur in Comilla is different due to its technological advancement and its link with two important cities, Comilla and Dhaka. Proximity to these cities has produced different issues and challenges for the village. Moreover, favorable geography has affected the productivity and demography of the village.

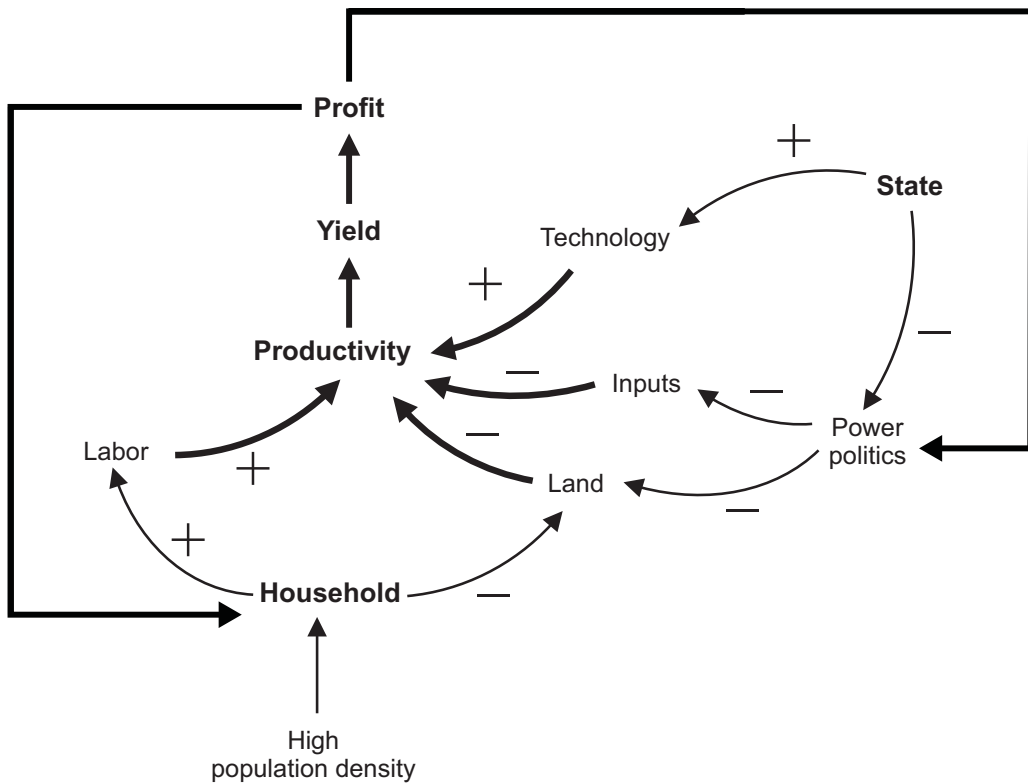


Figure 2.1 Production relation at Srimantapur.

The village has a greater population density but a lower rate of growth in population. Such high population density has been partly responsible for land fragmentation in this village. In addition, the village enjoys relatively higher productivity arising both from land fertility and the use of better technology. High productivity has increased the prospect of smaller families becoming self-sufficient of their own accord and has also played a role in land fragmentation. The land fragmentation, however, might have created the compulsion to be hyper productive as well.

Most of the landowning population are marginal farmers and smallholders. Small and medium farmers cultivate more lands than they own. The large landowners, who also have remittances as sources of earning or options for off-farm income, have been leasing out land to smallholders or landless farmers. Unlike in other villages, the large landowners are much concerned with increasing the productivity of their land as returns are higher. Nevertheless, landlessness is also growing in this part of the country.

Easy access to markets has reduced the necessity for intermediary services like cold storages, which are mostly owned by middlemen. Nonetheless, like the other villages surveyed in this study, the problem of interlocked markets is also prevalent in Srimantapur and Comilla. Smallholders, for example, borrow money from larger farmers or people engaged in off-farm activities or having both sources of income in order to buy inputs. When harvests collapse or competing demands are made on the household earnings, smallholders are forced to borrow.

Better communication has given rise to a different kind of accumulation compared to other villages: market-based exploitation, as it is well connected with a complex and well-functioning land market. The access to agricultural input also requires a certain degree of power or connection with the powerful coterie. Smallholders in some cases sell all their parcels to finance migration abroad. These plots are bought by money flowing from remittances or off-farm incomes, hardly from on-farm income. The land market is thus responsive to the inflow of remittances and off-farm earnings.

Nonmarket transactions such as land grabbing are prevalent in this village, and such grabbing occurs between neighboring plots where the powerful slowly encroach on the land of neighboring smallholders.

The village makes extensive use of hybrid seeds, water, and technology. Hybrid seeds have been in use since the early 1980s, and many farmers are second-generation users of chemical fertilizers. Soil fertility has thus been compromised due to increased application of chemical inputs and intensification of cropping. As a result, they say, future sustainability of production is also at stake.

VILLAGE II: THE VILLAGE VULNERABLE TO NATURAL DISASTER

Char Lakshmi of the Noakhali district is bordered by the Comilla district in the north, the Meghna estuary and the Bay of Bengal in the south, Feni and Chittagong districts in the east, and Lakshmipur and Bhola districts in the west. Unlike Srimantapur, Char Lakshmi is a remote and backward area that experiences low yields, with a land market characterized by primitive accumulation and sharecropping. The complex overlapping of the core variables of this study—institutions, technology, and power—has produced a dire situation for marginal farmers and smallholders in this region. These issues will be discussed at length throughout the study, but the general reasons for truncated productivity and rampant primitive accumulation will be discussed in this section with reference to the field survey data to set the scene.

First, the area is characterized by a constantly changing geographic and geomorphologic situation. The Noakhali district has been known historically as having high risks of natural and manmade calamities. The area has been seriously affected many times by natural disasters including high tidal bores, tornadoes, flooding, and cyclones. In 1970, a devastating tornado and tidal bore took the lives of about one million people, and in recent times, the area was hit by Cyclone Sidr in 2007, which caused the loss of 3,295 people; 53,000 more were reported missing, with around 8.7 million people directly affected (IFRC, 2010). Indeed, the evidence of this baneful environment is everywhere. Cyclone shelters—huge concrete structures—that dot the landscape are a testament to the area's susceptibility to natural disasters.

Second, a huge number of families moved to the area after being displaced by river erosion elsewhere along the coast. They move along the coastal areas with the expectation, as they say, that the land might rise again. Land regulations also account for this, and formally, if the land rises again within a 30-year period, legal provisions exist for its reclamation by the family who once occupied it (Asian Development Bank [ADB], 2014). This is, of course, often a messy process from which many disputes ensue. Provided the family can show documents of ownership, such lands can be regained, but often others having power and connections occupy the emerged land.

Third, the majority of people in the area are engaged in agriculture, most of them planting paddy for one season a year when the area is flooded in the rainy season and leaving land fallow for the other half of the year. The annual rainfall is plentiful enough to grow local, more resilient varieties of paddy in the rainy season. Fieldwork was carried out during the dry season, so almost all land in the area of Char Lakshmi was fallow at the time. As also can be seen from the district-level data, very few farmers are able to grow rice in this area during the dry season because of lack of irrigation and the unsuitable environment. This means that for half of the year, the vast expanse of this “cultivable land” is lying fallow.

Fourth, the village is divided by the Bari Bhat dam, built in the early 1980s. All respondents discussed the situation of the area with reference to this dam, which serves as a dividing line between two very different agricultural arrangements. On the inside (east) of the dam, farmers are engaged in paddy cultivation. They have a difficult time being engaged, and often have to rely on paddy that is produced on the other side of the dam. This is due to the salinity in the water, which makes it difficult for smallholders to harvest enough even for their families’ subsistence. In addition, as the situation is more volatile and tense on the western side of the dam, prices on the eastern side of the dam may go up in response, making land ownership in any form an even more potentially lucrative investment.

Fifth, aquaculture has naturally arisen in response to a natural topography and physiography wherein over time, river systems have resulted in what are called “oxbows.” The main rivers in the surrounding area are the Bamni and the Meghna, which branch out from the Meghna delta where the land meets the sea. These riverways account for a unique environment, which could be at the same time a blessing and a curse. The water in the canals is salty, tastes dense with salinity from the delta region just beyond the village area, and is difficult to cultivate. The farmers can cultivate at best only two crops a year due to the salinity brought in from the sea, and they are heavily dependent on heavy rains to wash away the salinity in the fields. As time passes, under varying flood levels that occur in different years such rivers may have changed their courses, leaving behind the formed oxbows (the curved remainders of rivers that stay on once the flooding has come to an end) together with the fish and other living organisms in them. The human population along the rivers, who by adaptation are natural fishermen, have

discovered that a good harvest of fish could be derived from these naturally formed oxbows. It was also found that seasonal flooding of these water areas restocked them with fish, which again could be harvestable during the ensuing dry season. The terrain in this area is exemplified by extensive low-lying areas with a network of rivers and a distinct monsoonal, annual rainy and dry period that has over time given rise to natural aquaculture systems. Subsequently, in addition to the seasonal natural stock of fish that enter the modified oxbows, additional stock may be planted, thus leaving scope for managed aquaculture. The natural abundance of fish in this unique environment helps explain the origins of aquaculture in the area and the industry that has built up around it. During the wet season, these outer areas become ripe for natural aquaculture—a huge quantity of fish can be easily harvested as they are washed up onto these land areas filling up the existing natural rivers and streams, especially in inland areas.

Sixth, as Bangladesh has increasingly been injected into the global economy, aquaculture has taken a new form. Private businessmen and large landowners have realized that large profits can be made in this coastal Bangladeshi environment and are intensively pursuing development of aquaculture for international markets. More than other forms of fisheries, the shrimp industry has emerged and is booming. Bangladesh is one of the top 10 shrimp-producing countries of the world, and cultured shrimp is known as “white gold” in rural Bangladesh.

Seventh, the terrain, people, and general feel of Char Lakshmi are quite different from those of Srimantapur. Only one main road leads into the area. A small and dusty area of a few streets lined with tin-roofed structures houses the business or market areas of Aktar Miar Haat, which serve the many surrounding villages. On either side of the main road lie burnished-looking fields, dotted with cattle grazing at what they can. Along the fields run canals, which are used to water fields during cultivation periods in lieu of mechanized irrigation systems.

DEMOGRAPHIC CHARACTERISTICS

The population density is rather low in this region compared to elsewhere. This is linked to a number of factors, including low productivity of the land and the frequency of natural disasters, which over time have contributed to a smaller and more spread-out population than in an area like Comilla, which is abundant and not disaster prone. Due to the challenges to crop cultivation in this region, such as high salinity in the soil and a lack of mechanized irrigation facilities, farmers have to labor on larger pieces of land than elsewhere.

Although people are more spread out here, population growth continues to be on par with the national average. In this community, people start their conjugal lives rather

young, and families tend to be large. Functional reasons for this, as they say, are linked with the larger parcels of land required for subsistence farming, which need more labor. For a subsistence production system family labor substitutes for the hired ones.

The size of the households is relatively large in Char Lakshmi compared with other villages. Most families have nine members or more, and the average number of people in a household is seven (Table 2.7). This may be partly because of the conservative nature of the area.

Although the area has Christian and Hindu minorities, the majority of the population belongs to a conservative Muslim group. In 1984, through a government order, the minimum legal age at marriage in Bangladesh was fixed at 18 years for females and 21 years for males. These requirements, however, have had little impact on marriage behavior in this area. Many married women encountered seemed much younger than 18. Demographic data on the larger Chittagong division in which the area is placed bears out this observation, as the marrying age is 18.8 years on average. The rate of females getting married between the ages of 14 and 19 is 120.4, and in the rural areas the rate shoots up to 159.7 (BBS, 2018).

Although early marriage is a common practice, villagers associate a number of problems with the tradition. In consonance with something of a Chayanovian logic, one respondent states that households formed when the couple is young often do much more poorly in comparison with their peers who wait. Early marriages produce large young families that are difficult to take care of, and as a result, many young families start off in an impoverished state.

Land Relations

Unlike in all the other villages studied, smallholders here own more land than they cultivate due to lower productivity. Smallholders own almost one and a half acres on average, whereas in other villages, the average land owned by smallholders does not exceed 0.6 acre (Table 2.8).

The percentage of small and medium farms fell by more than half in 2008 compared to 1996, whereas large farms declined by 23.34% during the period, indicating the increasing fragmentation of land (BBS, 2010).

The pattern of distribution of land ownership is skewed to smallholdings (Table 2.9). Large farms comprise only 5% of the households, whereas the concentration of medium farms accounts for 20%. About 40% of the total households have land for a homestead. Given the pattern of land distribution in the *char*, sharecropping is the most common arrangement of farming (Table 2.9). It is considered by the people here to be the most productive and effective way to use land if one possesses a lot of it and is engaged in other business.

TABLE 2.7 Relationship between Family Size and Operated Land (for each village separately)

FAMILY SIZE GROUP	NOAKHALI		COMILLA		BOGRA		TANGAIL	
	NO. OF HOUSEHOLDS	AMOUNT OF OPER- ATED AREA PER HOUSE- HOLD (AVG)	NO. OF HOUSEHOLDS	AMOUNT OF OPER- ATED AREA PER HOUSE- HOLD (AVG)	NO. OF HOUSEHOLDS	AMOUNT OF OPER- ATED AREA PER HOUSE- HOLD (AVG)	NO. OF HOUSEHOLDS	AMOUNT OF OPER- ATED AREA PER HOUSE- HOLDS (AVG)
1-2	29	.348	45	0.206	21	0.39	64	0.38
3-4	140	.862	23	0.426	232	0.99	337	0.38
5-6	205	1.74	25	0.660	165	1.58	198	0.59
7-8	141	2.58	66	0.771	68	1.95	35	0.81
9+	558	1.93	67	1.810	40	1.96	11	1.63

Source: Field survey.

TABLE 2.8 Average Land Held per Household (acres)

	TOTAL LAND OWNED	CULTIVABLE LAND
SMALLHOLDERS	1.49	1.11
MEDIUM FARMERS	3.06	4.23
LARGE FARMERS	8.01	15.33

Source: Field survey.

TABLE 2.9 Pattern of Distribution of Land Ownership

LAND OWNERSHIP GROUP	% OF HOUSEHOLD	% OF LAND OWNED	% OF CULTIVATED LAND LEASED IN	% OWN LAND— SHARE OF MORTGAGE IN	% OWNED LAND— SHARE-CROPPED	% OF CULTIVATED LAND	% OWNED LAND— MORE THAN ONE
Own only home-stead land or land-less (0–.04)	39.7						
0.05–2.49 acres	36.4	67.8	0.5	1.5	8.9	11.9	9.4
2.50–7.49 acres	19.2	37.4	.09	—	20.6	12.1	29
7.50 acres and above	4.7	15.4	—	1.0	11.5	11.5	57.7

Source: Field survey.

More than 10% of the land being cultivated is *khas* (government owned). The government has also in its possession vast areas of land in the coastal region, where *char* areas (accretions) appeared from the bed of big rivers or the sea by way of new formations.

Production Processes

As it is elsewhere, paddy is the main crop. Both *Boro* and *Aman* are grown in the district, but in Char Lakshmi, *Boro* is not common at all because it is a dry season crop and irrigation infrastructure is not available to support it. The yield of *Aman* is relatively less while *Boro* is a modern high yielding variety. In addition to paddy, peanuts, varieties of pulses, chilies, sugarcane, and potatoes are also grown. These have replaced crops that used to be widely produced but which have become extinct or nearly extinct in the area. These include linseed, sesame, jute, local varieties of paddy, and various pulses. Two core reasons account for the shift. Cash crops with linkages to local industry, such as jute or the production of consumable oils, have been pushed out in the backdrop of liberalization of trade and cheaper substitutes.

More so than in other areas, the ability to earn a livelihood from land is more constrained. Environmental reasons alone are not responsible for the tenuous situation faced by farmers. Institutions, politics, and power, as well as a dearth of technology act against the efforts of this agrarian society's ability to be productive. Almost all categories of farmers have fallow land. It is not that they do not want to crop but that they are dependent on seasons and do not possess the appropriate technology (Figure 2.2).

The use of technology is limited in this area compared to anywhere else. Lack of mechanized irrigation facilities is one of the major impediments in the dry season holding back the farmers from cultivation. There are not enough canals (relief for flooding), and they do not have the required deep and shallow tube wells nor the conditions that are needed to implement a functional irrigation system. Part of the problem relates to the salinity in the ground. These machines must be dug extra deep in order to reach the freshwater, and this requires even more advanced expensive technology. The average irrigated area in Noakhali is well below the national level. The percentage of irrigated-cultivated land is only 32.84% in the Noakhali district as opposed to 48.3% at the national level, whereas the use of fertilizer is limited (BBS, 1999, 2010).

Only larger farmers in this village had the ability to cultivate two crops a year as they had access to the required technological inputs. Lack of access to technology is also evident by a few farmers' reliance on hybrid seeds, which need chemical fertilizers and pesticides.

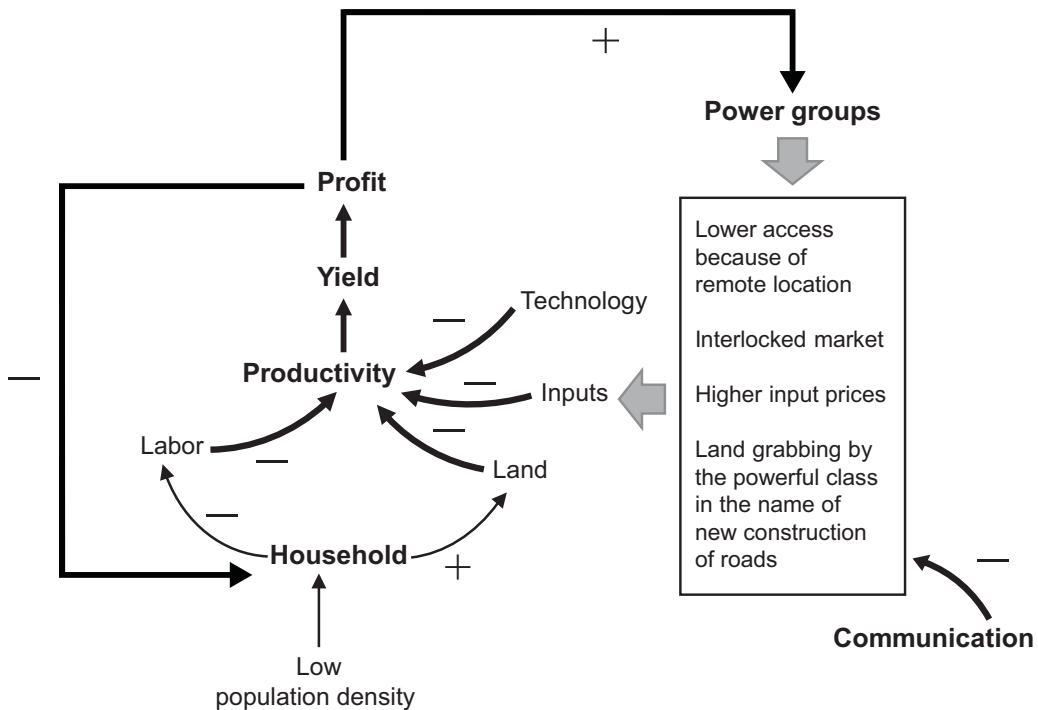


Figure 2.2 Production relation at Char Lakshmi.

Exchange Process

Many farmers have to sell their crops before they are even harvested in order to get the money they need to purchase inputs and meet household needs. “The cash now, for crops later” may of course lead to indebtedness if and when crops fail. This compels them not to graduate out of their tiny holdings, and eventually, with higher indebtedness, they are rendered landless, which is also growing in the region.

In Char Lakshmi, most cultivators were not linked to a market beyond the local Aktar Miar Haat. The fishing and shrimp industry is, however, more directly linked to an external market because of river connectivity. As the industry has grown, so too has communications. Better communications give farmers better access to the *haats* and *bazaars* in their area, that is, better market access.

The increased infrastructure benefits rural populations in many ways, and also exposes them to the shocks of being a part of a larger system. Since the natural environment is not conducive to productivity, the increased market access facilitated by better communications does not necessarily provide for improved living standards. Rather, these improved communications are beneficial mainly for large landowners, who are often also businessmen and industrialists. Their grabbing of land through power has furthered the disparities in the area and increased the extent of the deprivations that smallholders experience. Large landowners use the existing communications to move their production out with rapidity and regularity. Sharecroppers on this huge swath of land report large trucks filled up with produce being transported to markets far away from the local *haat*. The gradual improvements in communication, coupled with the existing natural topography and physiography for commercial aquaculture, has led to greater primitive accumulation of land and the consequent dispossession of smallholders.

Land Transactions and Power, Politics, and the State

The land transactions also occur on a seasonal basis. Land is sold most commonly during the dry season between March and May, when some households sell land in distress and others invest in other income-generating ventures that require cashing in on their land investment.

Land is frequently transacted through both legal and extralegal means in Char Lakshmi. This is surprising, given that most of the land is under government lease and thus cannot legally be sold. Land moves not only from smallholders or landless tenants to wealthy large landowners but also between the wealthy. Respondents told with clarity that in fact it does not matter so much what political allegiances the wealthy owe; they are all on the same side, and certainly transact with each other.

It seems that the institutions and the corresponding bureaucracies that have been established to facilitate and monitor land transactions have resulted in opening new avenues for the powerful to grab land, especially in this area, where land is always being lost and regained due to the natural processes of erosion and siltation. And where there is a lot of interest in land for commercial purposes, the corruption of officials relating to registration, recording, and revenues of land is one subject that people discuss quite openly, precisely because the stories are so widespread and the issues are common knowledge. Thus, the rent-seeking behavior of the law-enforcing agencies and the politicians is common. There is a nexus among local businesses, politicians, bureaucrats, and the judiciary, and these relationships are also vertically organized from the local to the central level for protection and sharing of rents accrued through primitive accumulation.

People in the past had to rely on common knowledge and a collective history, using the maps in their heads and the knowledge held by older generations and community leaders to guide their decisions about the land. Now the focus is on the institutions; everything revolves around documentation—who has documents or not, and who can pay bribes for demarcation documents. The institutions of the state are thus leveraging rent-seeking and primitive accumulation.

Outside the dam area, to the west of it, fishing is much more prominent. Poor farmers commonly sell their land to the “projects” that private businessmen and large landowners start up in the area. Another notable aspect of Noakhali is that it is home to a portion of the country’s elite business class. If land is not put up for purchase, land may often be grabbed. The land being transacted, whether coercively or not, is generally in much larger areas than in the inside area of the dam. The outside area of the dam is described by respondents with reference to what sounds like a sort of “Wild West” script. References to pirates, terrorists, gangs, and robbers are common. Smallholders who lose their land become day laborers in cultivation and/or in fishing. A local variety of paddy, *rajashail*, is more productively produced on this side, and fishing activities for personal household consumption are taxed. The area is generally described as deprived.

While much of the land, especially on the outside part of the dam, has been occupied to use for aquaculture, many of these so-called “projects” have not been developed. Respondents confirm that the boom in aquaculture has not actually been realized in this area, but that large landowners and private businessmen use this newest capitalist development as a loophole through which to legitimately accumulate more land. In other words, enterprising individuals, as well as companies, are able to set aside huge swathes of land to use it for “projects” with the consent of the government. While they have acquired the land, they are not necessarily producing on it. Unlike in other areas studied, the state is much more present in this remote area because most of the land outside of the dam is *khas* land owned by the government and is intended to be leased out to smallholders or landless people. People’s land is more dispersed here, which makes

sense as the environment is so unpredictable (this applies generally and not just to the powerful/land grabbers). Disputes are mostly about *khas* land—new land—more than about land inside of the dam area.

There are seemingly endless references by respondents to the burdens of proofing documents for all transactions. Almost every discussion about maps, stamps, or documents was with reference to the relationship between power and knowledge exercised by the powerful in the area. Clearly, those in power are using official procedures to displace people who are powerless and illiterate.

Summary: Char Lakshmi, Noakhali

The village of Char Lakshmi, Noakhali, is characterized by a vulnerable geographic position, primitive accumulation, and a poor state of agricultural technology. The population density of this village is also low compared to the other three villages, though characterized by high fertility.

Char Lakshmi is a highly cyclone- and flood-prone village. As a result, agricultural productivity is low, and farmers have to cultivate larger land areas than elsewhere. Smallholders own more land than they cultivate due to climatic variabilities including natural disasters. Displacement from land is also high in this village due to river erosion. Although officially the land lost due to river erosion can be claimed within 24 years, the reality of institutional barriers imposed through the nexus of political settlements and bureaucratic complexities render differing results based upon access to, and command over, power. Smallholders may even end up being landless, even though they pay bribes, while this has become another route to primitive accumulation of land by the powerful.

Due to the remote position of the village and the absence of nearby markets, both product and factor markets are interlocked. Farmers have to sell their crops before they are even harvested to pay for inputs and to meet household needs, often leading to indebtedness and then to landlessness, which is increasing in the area.

The process of primitive accumulation is more robust here from several sources. First, the ongoing improvement in communications has enticed land grabbing by large landowners, who are often businessmen and industrialists. Second, large landowners and private businessmen acquire, lease, or eventually amass public land as “projects” for commercial aquaculture through exploiting loopholes in the sanction of public lands and thereby “legitimately” accumulate more land. Third, the institutions and the corresponding bureaucracies that have been established to facilitate and monitor land transactions, including registration, recording, and revenue, have resulted in opening new spaces for powerful people to grab land. Bribery and corruption by officials who often collaborate with the wealthy and powerful are found to have been widespread

due to complexities associated with data, deeds, maps, and records of land. Clearly, the bureaucratic apparatus and systems are abused as a means to displace people who are powerless and illiterate.

The use of technology is limited in this area compared to anywhere else. The average irrigated area in Noakhali is well below the national level. A few farmers rely on hybrid seeds and only larger farmers have the ability to cultivate two crops a year due to their access to appropriate technology.

Intervention after the Green Revolution in the form of a dam has differentiated the salinity level of the two sides of the village. This has created differentials in terms of both output and land price in the village. Although access to inputs and irrigation as a result of the Green Revolution has traditionally enabled certain small landholders to hold on to their small plots for some time rather than rendering them landless, larger landholders have benefited due to their capacity to finance the required input at an appropriate time and sustain the harvest to sell until the price is at its peak. There is widespread prevalence of interlocked markets.

VILLAGE III: THE VILLAGE OF MIGRANT WORKERS

Bara Pakhia, in the district of Tangail, lying to the northwest of Dhaka, is chosen for its financial deepening through inflows of remittances due to the presence of a large migrant community. This village can provide information about how migration has influenced the agrarian transition and what may be expected if the trend continues. This village is quite spread out and within easy walking distance of the local *haat*.

This area is marked for its high rate of out-migration, with residents mostly leaving to work as young contract laborers in oil-producing states like the United Arab Emirates and Saudi Arabia as well as in Southeast Asian countries such as Malaysia. A huge proportion of men are “missing,” almost as many as two persons per household. While they are “missed,” the remittances they send home have had enormous repercussions on the community, land transactions, and agricultural productivity.

Demographic Characteristics

The Tangail district is home to over three million people, comprising an almost even male-female ratio. The population has declined by almost 0.3 million in a decade (BBS, 2015). This is partly because of a declining population growth rate over the years, to 0.9% in 2011, and partly because of the increasing tendency of young men to migrate abroad. Family planning is becoming increasingly popular with the trend being to have two

children in each family. Marriages do not occur at a very young age in this village either, as girls are married at age 18–20.

Bara Pakhia is only one of 166 villages in the Delduar Upazilla, which occupies a space of roughly 185 square kilometers. According to the 2001 population census, the population density is 1,284 per square kilometer, up from 1,021 in 2001. Household size is 4.3 on average, which corresponds with the field survey, and the decadal growth rate of the population is 10.0% (BBS, 2011). The number of households in Bara Pakhia is 763 (BBS, 2011). Almost half of the population in rural areas depends on agriculture as the main source of household income, with almost 30% of this being sourced from cultivation, livestock, and fishery and 20% from earnings from agricultural labor. The remainder of the population derives its main income from nonagricultural labor, business, religious service, and other industries.

Migration

The salient feature of the village is heavy out-migration, which is intrinsically related to possession of land. It is two-way traffic: It is impossible to go abroad without land to finance it, on the one hand, while inflow of remittances is underwriting general household consumption and investments in land, on the other. The potential of migration to generate future income is seen by respondents as “limitless.” When asked to compare it to an investment in land, one respondent said: “Land is very important and not as risky, but there is a cap on how much you can make with it.”

A village-level estimate suggests the extent of migration is 2,000, which comes to about two or three heads per family. Migrants and their families say they would have invested in education as they value this more, but education is costly and there is a dearth of jobs. Accordingly, financing migration is clearly seen by them as the best way of reaping the gains of an investment. Thus, pursuance of such a “no better option” has left its mark. The general level of education has gone down in the village as a result of their choice to emphasize migration over education. Some respondents, however, suggest that this trend is being gradually turned around with children getting an education by using the remittances sent home.

If someone has money from remittances, the practice is to lend it out and gain interest on it (in cash or rice) more than to invest it in other ways or put it in the bank. Apart from being used as mortgages, remittances are also being used for meeting family needs, to send other family members abroad, to recoup land that was mortgaged out, or to pay back other loans, buy more land, build better or more housing, install tube wells, and purchase a tractor for better cultivation. Remittances are also used to enable other family members such as the older ones to stop working on land by themselves and sharecrop the land out to others instead. The community has changed since remittances have gone up.

Land Relations

In Bara Pakhia, as said above, land is highly correlated with migration. The heavy out-migration has two impacts: First, most migrants relied on selling land to finance the costs of going abroad. This has resulted in land fragmentation. Second, the inflows of remittances resulted in a gradual concentration of land in the hands of persons who could afford to send money from outside of agriculture. The nonagriculture income is, therefore, changing the pattern of ownership of land with the gradual rise of landlessness, as smallholders are not able to buy land from their meager income from agriculture while external shocks are rendering them landless.

The surplus that farmers can produce on land typically does not generate enough earnings to enable the purchase of more land. Money always comes from outside of the rural market system for land purchases, unless land itself is being mortgaged or sold to buy more land. They say: "Laboring on the land alone cannot maintain the family." A number of respondents who really wanted to buy land were "true" farmers, that is, they could not imagine ever doing anything else, and they had no education to apply their skills in any other area. This must be tempered, however, by the fact that in one case, the respondent also wanted his sons to get an education and go into business where they could do well enough to sharecrop the land out.

Some people sell land to buy a similarly sized parcel that is closer to their home or other landholdings, or because the land has higher fertility. Those who sell land take the opportunity to widely advertise as a way to get the best possible price. A lot of people want to buy land, for example, with their remittances, but they also spend their money on other things like building houses, since there is not enough land available in the market.

Land transaction also takes place in terms of mortgages and sharecropping. People who mortgage out land have full use of the land until the loan is paid off. One reason for mortgaging instead of selling was because it took much less effort regarding the institutional processing. Getting a loan from the bank is often time consuming and requires a connection to the powerful, along with collateral for the sanction of a loan from institutional sources. A typical method is to sharecrop the land out, sometimes to the mortgager. In other words, one person takes a loan from the other, using the land as collateral until it can be repaid, but they continue to work on the land themselves, as they always have done, but now have to give half of what they grow to the mortgagee. So, in order to access the lump sum of money needed to diversify their investments in some way (usually to finance migration abroad), they give up all or half of the use of their land. If they are then sharecropping their own land, they also split inputs on land (the usual arrangement is 50/50), but inputs may have to be increased (in particular, labor has to be intensified) to make enough to offset the portion that goes to the mortgagee. Some sharecroppers are also in a mortgaging relationship, still working

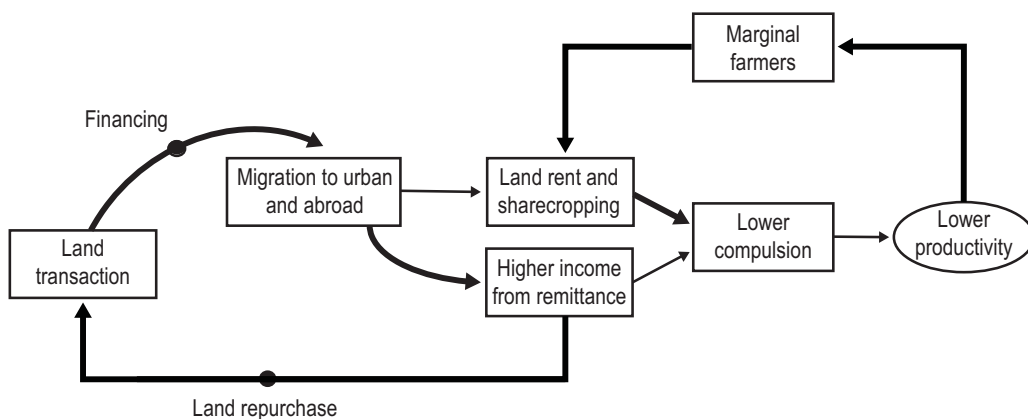


Figure 2.3 Land relation at Bara Pakhia.

their own land, but getting half the output. The members of the family also mortgage land to each other and then sharecrop it. It is a way to help the members of the family to manage land and migration.

Most sharecroppers continue sharecropping as there are not enough people to work on the land (in the family, with so many people abroad), and day laborers are expensive and require more supervision. The sharecroppers are usually poorer families who have little or no land of their own. Only the richest give out lands for sharecropping as the lands they possess are too large to look after by themselves, and as they are also usually engaged in other businesses. The trend recently has shifted in favor of renting relationships rather than sharecropping (Figure 2.3).

The gap between land-owned and land-cultivated increases substantially as people move from small to medium to large categories (Table 2.10). This can be largely attributed to the mortgaging and renting systems that have arisen. Part of these might also be land that families are taking care of in somebody else’s absence. Mortgaging seems to be the main way that money is borrowed and lent. There are microfinance NGOs operating in the area, but they are not very popular. People say that even though the rates of interest are high, there are other benefits to borrowing from local people: The repayment schedules are not as strict and frequent as required by NGOs, and moneylenders may accept rice or other produce as partial payment. They say that

TABLE 2.10 Average Land Held per Household (acres)

	LAND OWNED	CULTIVABLE LAND
SMALLHOLDERS	0.62	1.22
MEDIUM FARMERS	1.52	3.87
LARGE FARMERS	5.04	10.6

Source: BBS (2010).

the moneylenders are local and are sensitive to harvest cycles. They prefer paying back loans in lump sums.

Production Process

While the reduction of the capacity of the jute industry in the wake of “sickness” was a severe blow to cultivators, farmers here have been compelled to move to other production. Across the country, the jute industry has been dismantled in the process of liberalization. Communities use metaphors of illness to discuss the decline of the industry, explaining for example that “the industry became sick” or that “the jute industry was diseased,” and that “it died.” This is an example of how the production varieties have changed over time. Now farmers are barely growing jute. The extinction of local varieties of paddy is an effect of introducing high yielding and hybrid varieties that push out indigenous seeds. Farmers are also growing rice for subsistence and selling it if there is anything left over. Yet some smallholders have to supplement consumption by buying from the market.

If compared with other villages, productivity is quite low across all categories in the village of Tangail, which may be linked closely with the high proportion of migrants (absent men) and the effects of remittances, as the inflow has allowed purchase of land but there is no compulsion to be productive on it, since a major share of spending is met by remittances (Table 2.11).

People complain, as they do everywhere, about the fertilizer system. Just as in Noakhali, there is a lot of mention of lists and that some names get left off by accident, or people use others’ names falsely and then the real recipient is left with nothing. They have to wait in queues and may never receive anything. It is expensive as there is not a large enough supply of fertilizers. Sometimes they have to travel far and/or pay bribes to get it. They often do not get it on time. Respondents allege that the agricultural extension office does not provide seeds and fertilizers at the appropriate time, but the extension officials assert that this is not their fault as they do not receive the seeds or fertilizers when they request them.

TABLE 2.11 Productivity per Acre (in *maunds*)

	PRESENT CROP	2ND CROP	3RD CROP	4TH CROP
SMALLHOLDERS	38.02	13.50	24.41	—
MEDIUM HOLDERS	24.10	12.35	24.06	—
LARGE FARMERS	35.98	11.66	25.52	—

Source: Field survey.

The owners of tube wells take 25% of the harvest on the land where their machines are used. For those who own tube wells, electricity is a problem. They say access to electricity depends on the relationship with the providers, a link correlated with money and power.

POWER, POLITICS, AND THE STATE

Power has now become integrated with migration. Power is shifting to those who have sourced foreign income, reflecting the general notion that money dominates the composition of power. Moreover, most people link social status to money.

It stands to reason that the decision to invest in land may be gainful for migrants themselves and their families as land is linked to status and has a store value. This trend may have more problematic ramifications for the wider community. While the decision to purchase land may be a strategy for continuity within one family, or within a subsection of rural society, evidence suggests that it may also result in increased inequality and changing class structures. For example, one respondent says that joint families have more power than those who are fragmented. One respondent says that the biggest problem in the village is that “some people do not let other people prosper” — suggesting competition and increased inequality that is facilitated by unequal power relations and new sources of power that can be utilized against others.

Summary: Bara Pakhia, Tangail

The village of Bara Pakhia in Tangail mainly shows how the inflow of remittances is linked to land transactions and their relationship to productivity. This village is heavily dependent on remittances, which are linked to land in financing immigration abroad on the one hand and investing in land from remittances on the other. In addition, remittances are also used to enable, in particular, aged members of the family to retire from cultivating land and to give the land to sharecroppers.

The decision to invest in land by the migrants has intricate corollaries in the wider community. Productivity is quite low in Tangail, which is also linked to absentee landlordism due to the high proportion of migrants and the lower compulsion to make land more productive in the presence of income from remittances.

The surplus that farmers can produce on land typically does not generate enough earnings to enable the purchase of more land. The number of landowners who are growing are doing so depending on remittances, and land has become a store of value in this village, as the price of land is increasing significantly. A study on rural West Java

similarly has found that appropriation of surpluses from the cultivation of crops actually played a less robust role in accumulation than did the accumulation of capital outside (Pincus, 1996). Ullah (1996) has also found the same.

VILLAGE IV: THE VILLAGE OF SUBSISTENCE PRODUCTION

Dastika, located near the town of Bogra in the northern Rajshahi Division, is often referred to as the gateway to north Bengal. This village is chosen since traditional farming still persists here along with the cultivation of modern varieties. Unlike other villages where many of the homes are constructed using modern materials, homes here are made in the traditional style, using local materials such as muddy, thick clays and bamboo. Many homes open into a common area with the house built in a square formation around a courtyard-type space. These larger erections house joint families and provide their own space for each extension of the family. Normally the household's animals also share the common space—chickens, goats, and cows are more in evidence than in other villages.

The area is better connected with the rest of the country, owing to the construction of the Jamuna Bridge. The income opportunities are enhanced by off-farm employment available to villagers due to their proximity to the urban center of the region. Thus, this village demonstrates the closing of the urban-rural divide and its implications for agriculture. The increased connectivity between this northern district and the rest of the country has certainly opened up Bogra to wider markets and as such trade and commerce have flourished. This is evident in the level of diversification of income-earning strategies observed at the village level.

Demographic Characteristics

The density of the population has increased, with a higher than the national average number of people per square kilometer. The rural-urban divide is extremely blurry in this village since it is so close to the town of Bogra. In many ways the area feels much like a suburb of a city, with most community members commuting back and forth for work every day. The town absorbs much of the surplus labor in the village.

Earnings are rather diversified in the village of Dastika. What is captured in the interviews is that for most individuals and families, occupations overlap. The large landholders are commonly engaged both in agriculture (normally supervising the activities of day laborers on their own land) as well as in business of some sort. Smallholders, under compulsion for survival, have to diversify their sources of income. This is

understandable, not only because the sources of income are so diverse, but because families are so large.

Most farmers own less than 3 *bighas* of land and work in the town. Some work as rickshaw pullers; some have shops; some are in the fruit business; others sell bamboo; carpenters and construction workers are also common. Artisans work from home in the village; women take up cottage industry work such as rolling the paper forms for the local cigarette manufacturers. Quite a few people have temporary shops, essentially stalls alongside the road or in the market. Some are engaged as weavers and have temporary stalls. In the artisan area of the village there are about 150 handloom machines, mostly old and handmade. Most of the time middlemen come to these families to collect the wares.

Land Relations

Landowners, whether small or medium in size, cultivate on average twice the quantity of land they own (Table 2.12). Since small and medium farmers cultivate more than they own, large farmers are clearly leasing out (Table 2.13).

TABLE 2.12 Average Land Held per Household (acres)

BOGRA	TOTAL LAND OWNED	CULTIVATED LAND
Smallholders	0.60	1.26
Medium farmers	1.74	3.68
Large farmers	10.24	7.64

Source: Field survey.

TABLE 2.13 Distribution of Land Ownership (Bogra)

LAND OWNERSHIP GROUP	% OF HOUSEHOLD	% OF LAND OWNED	% OF CULTIVATED LAND LEASED IN	% OWN LAND—MORTGAGE IN	% OF LAND—SHARE-CROPPED	% OF CULTIVATED LAND, <i>KHAS</i> LAND	% OWNED LAND—MORE THAN ONE
Own only home- stead land or landless (0–0.04)	71.71						
0.05–2.49 acres	23.65	67.6	—	19.3	2.1	9.0	2.1
2.50–7.49 acres	4.14	80.8	11.5	—	—	3.8	3.8
7.50 and above	0.15	100.0	—	—	—	—	—

Source: Field survey.

Larger farmers rent out their land to medium farmers and smallholders on an annual basis. The people who rent are successful in business in Bogra and do not have the time or interest to cultivate the land by themselves, nor the time and will to supervise laborers. Some large farmers also, however, sharecrop out their land, mostly to smallholders. Smallholders are renting to have a scale effect to meet their basic needs. For example, they may own a small plot of their own on which they cultivate rice for their own consumption but rent out high land to grow crops for the market, such as potatoes and maize. This tenure relationship is quite stable, as leasing arrangements often run for many years at a time.

Mortgaging is still nascent in this village but is becoming more popular. Land can be rented for as little as 3,000 *takas* per year per *bigha*, whereas mortgages go for roughly 20,000 *takas* and the land remains in the hands of the lender until that amount is repaid. The leasing system is, however, still extensive. Prices vary depending on the crop intensity of the land.

Production Process

In Dastika, most farmers produce at a subsistence level. People prefer to grow a local variety of rice since it is for household consumption, and it tastes much better than the hybrid rice. When asked how much they produce, most respondents give an estimate of how many months their production covers family consumption. Most often, farmers cannot cover their needs for the year and use earnings from off-farm activities to purchase rice from the market. Only large farmers sell their produce to the market. Farmers cultivate two crops per season normally. There is both low-lying and high land in the village. What can be grown and how many crops can be grown per season depend on the type of land farmers own. If they have high-level land, two crops of rice can be grown as well as one crop of vegetables, for example, potatoes.

Fertility of land is a major concern, and prices for land and for mortgaging or renting land are based on standards of fertility as well as location. The gap in price reflects not just the ability to produce higher income-generating crops on high land but that these are the areas where people can build homes.

For being primarily subsistence farmers, Dastika landholders spend a large share of their incomes on the inputs required for increasing productivity. This is acquired from multiple sources, including income and loans from merchants and NGOs.

There seems to be a general agreement in the village that productivity has increased substantially with the increased use of technology. Many claim that they are also getting better prices for their products. The prices for inputs are high, and the margin of profit is negligible if not nonexistent.

If they are not sharecropping or renting land out, most farmers use laborers and either supervise the work themselves or work alongside their hired help. Labor is hired

for harvesting season as well as for preparation of the land and occasional weeding. It amounts to roughly five days a season in rice production on one *bigha* of land. During the low season laborers are paid less while the wage doubles in the harvesting season. They always receive two meals from their employer and are also often given half a kilogram (kg) of rice in addition to payment. If farmers cannot provide their laborers with this extra rice, the price for the labor goes up by way of compensation. They say that hiring labor, though expensive, is more profitable than sharecropping of land.

More so than in the other villages, farmers rely on a range of materials for their fertilizer. Each respondent seems to have a different method, yet chemical fertilizer mixed with cow dung is almost always included. They also use chicken waste from poultry farms, the rich waste produced by mustard crops, ash, and other ingredients. As was the case elsewhere, complaints about fertilizer were heard all around. Roughly 20 kg of fertilizer is needed for each *bigha* of land, but most farmers are being supplied with only 5 kg, which is the official amount that farmers have been given. This may be the reason for sticking to a mix of fertilizers.

A number of villagers note that rich farmers are able to be more productive since they have greater access to inputs and can “afford to experiment,” whereas for smallholders the risks of experimentation are too high to meet the expense of it. That being said, smallholders are acknowledged to be more productive generally because they invest heavily in labor, and they take care of the land better. They say that they “treasure” the land as a precious resource as opposed to large-holding businessmen finding it less profitable than their other portfolios.

The more productive farmers, who have enough land to produce surplus, are using hybrid seeds. Hybrid seeds are a recent introduction in the village, and most of the users are convinced of its success as they see their production is easily doubled. Although this technology has only come to the village in the past several years, most farmers are starting to switch over. The surplus is better, but the costs are much higher. Not only is the seed expensive, but natural fertilizers are not compatible with hybrid seeds, and pesticides are commonly needed as well.

Exchange Process

Farmers who have a surplus can sell their produce directly to consumers in the bazaar, or in the case of rice take it to the rice mill for processing. The rice millers, acting as a middleman in this case, engage in different malpractices. The millers also make a huge profit. For example, farmers sell their paddy for 630 *takas* per *maund* to the millers and they double that price. The millers also cheat smallholders in different ways, including profiting out of measurement as they employ tricks through using nonstandard systems.

Prices also depend on the timing of the sale. In harvesting season, a lower price is fetched. Most farmers (i.e., smallholders) cannot afford to preserve their produce

till the rise in prices since the peasants need cash immediately at the end of a harvest to pay for family expenses, repay debt, and invest in inputs for the next season. In addition, most families do not have homes large enough to store rice for a longer period of time.

Land Transactions, Power, and Antecedent Agents

Landlessness is growing and smallholders are being forced to sell. They are selling to medium and larger farmers as well as to NGOs. The competition over land is increasingly becoming fierce and smallholders are being pushed out of the land market in a number of ways, but differentiation and polarization is being subdued by multiple sources of income beyond cultivation, including income earned during off-peak seasons and farming hours. Many people also migrate as far as the capital city of Dhaka to work in construction or as rickshaw pullers during such periods. The primary reason for selling land is related to family expenditure due to a deficit between income and expenditure and repayment of debts (Table 2.14).

The town is encroaching on the village space to quite an extent. The town “used to be tiny” but is now an intense site of struggle over ownership and control. The government has also bought arable land for building government offices, hospitals, and schools. This development is desired by villagers, but they note that a fair price was not paid for the land. The wealthy are also selling to each other (Figure 2.4).

The involvement of a large national NGO formed from this locality in the land market has caused prices to go up substantially. The NGO is also leasing what were formerly communal ponds from the government as well, which lays an extra burden on the community. Land transactions are more frequent because population growth is greater, more people need to buy land for their families, and more people need to build homesteads. Generally, smaller farmers are being forced to sell and medium and large farmers or NGOs are buying.

TABLE 2.14 Reasons for Land Sales by “Declining Household” (percent)

REASON	MARGINAL FARMERS	SMALL-HOLDERS	MEDIUM FARMERS	LARGE FARMERS
Family expenditure	31.92	21.4	25	—
Marriage of daughter	6.34	7.1	50	—
Cost of migration	17.46	35.7	—	—
Medical expenditure	3.17	7.1	—	—
Land distribution to family members or others	0.0	0.0	—	—
Other	39.68	20.8	50	—

Source: Field survey.

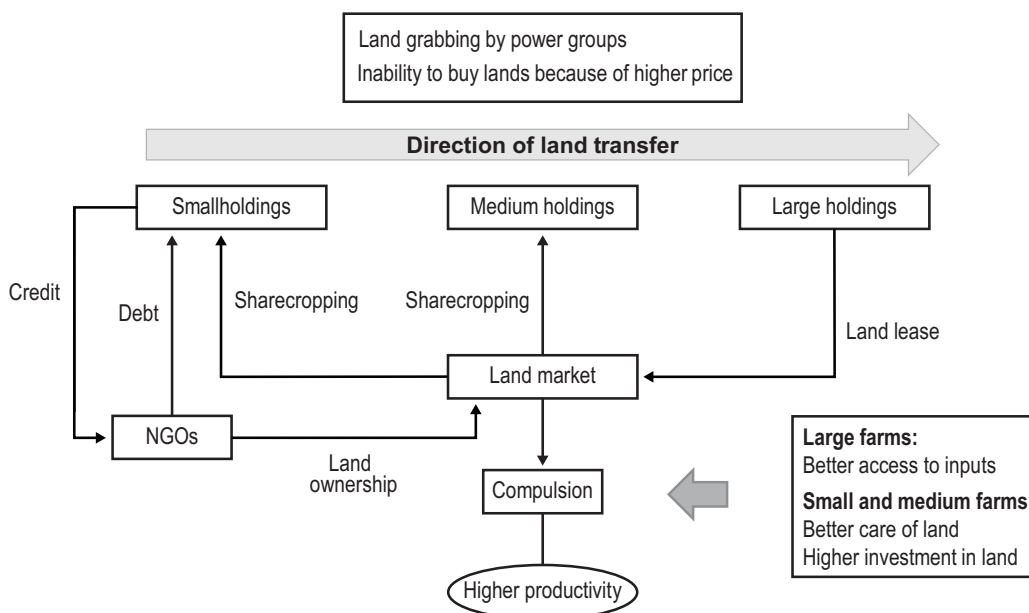


Figure 2.4 Direction of land transfer.

While this village has a number of large landowners who own a disproportionate area of land, oppression from this group is not the average landowners' main concern. The NGO is frequently cited as the primary obstacle to productivity. Not only are many farmers indebted to this microcredit lending organization, but the funneling of profits into land ownership in the village has squeezed farmers' ability to be productive and threatened their security on the land.

When asked about land grabbing, most people responded in the negative. Although the NGO pays an above-market price for land, the pressure applied by the organization that induces these sales is tantamount to grabbing. By digging ponds and planting eucalyptus trees on the land they own, the NGO heavily degrades neighboring plots, thus pushing farmers to sell. It is well known that those who run the NGO, while not overtly political, are well connected. In cases where community members have opposed the NGO's position, the police and other authorities are quick to engage on the side of the NGO.

SUMMARY: DASTIKA, BOGRA

The population density of the village of Dastika, Bogra, is increasing at a rate higher than the national average. Moreover, due to greater population growth, land transactions and resultant land fragmentation is high as well. On average, small and medium-size landowners cultivate twice the amount of land that they own and large farmers are leasing out. More than in the other three villages, farmers, especially smallholders, bought

or leased in land primarily with the aim of increasing output. On the other hand, many of the large farmers who sharecrop out own a lot of land and do not cultivate any of it by themselves, preferring to stay in business and let others work the land.

The agriculture of Dastika is mainly characterized by subsistence production. It is also a village where smallholders cultivate more land. The land grabbing is there and is primitive in nature. The problem of interlocking markets, as identified in rural areas of Bogra and Noakhali by other studies (e.g., Crow, 1999), has been confirmed in the case of Dastika, and also has been found in Char Lakshmi, Noakhali.

Most often, peasants cannot cover their needs for the year and use earnings from off-farm activities to purchase rice from the market. Only large farmers, of which there are few, sell their produce to the market. The more productive farmers, who have enough land to produce surplus, are using hybrid seeds and advanced technology, although the costs are much higher.

Despite the apparent increase in productivity according to most villagers, the opinion of some of the villagers is that rich farmers are able to be more productive because they have greater access to inputs and because the risk of experimenting is low for them. Even then, smallholders acknowledge increased productivity generally because they invest heavily in labor, and they take care of the land better. This is in accordance with the empirical evidence that was found in prerevolutionary Russia and China and other poor countries in Asia, Africa, and Latin America that there exists an inverse relationship between farm size and farm productivity (Dyer, 1997).

Most farmers cannot afford to preserve their rice until the prices rise since they need cash immediately at the end of a harvest in order to pay for family expenses, debt repayments, and investment in inputs for the next season. In addition, most families do not have homes large enough to store rice for a longer period. However, farmers who have a surplus of rice can sell their paddy directly to consumers in the bazaar or take it to the rice mill for processing. The rice mill, acting as a middleman in this case, is not the most popular option because of their malpractice.

Landlessness is growing and smallholders are being forced to sell to medium and larger farmers as well as to a large NGO. Not only are many farmers indebted to this microcredit lending organization, but the funneling of the NGO's profits into land ownership in the village has increased land prices and threatened the security of their land.

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PRODUCTION RELATIONS AND AGRICULTURAL PRODUCTIVITY

INTRODUCTION

During the mid-20th century, countries all over the world were faced with the challenge of providing adequate food to all. Starvation plagued many parts of the globe. It was during that time that Norman Borlaug, an American agronomist, and his team of scientists came up with the innovation of disease-resistant, high yielding dwarf wheat varieties. These varieties of crops survived diseases and were more capable of responding to fertilizers and pesticides. Norman Borlaug was credited for this innovation, which is thought to have saved great populations from starvation (Lynch, 2007). Later, this innovation led to the creation of many more modern varieties of crops including rice. This became known as the Green Revolution. The new high yielding varieties required the use of newer production methods incorporating irrigation, chemical fertilizers, pesticides, and machineries. Agricultural production methodology saw a mammoth shift. Borlaug was later awarded the Nobel Peace Prize for his contribution.

Agricultural productivity in its simplest form means the amount of output derived from the input used in production. Agricultural productivity has become crucial in recent years as countries are racing to increase agricultural productivity to meet the future food demand. However, the debate surrounding productivity is not a recent one. Marx had identified agricultural land as the source of productivity in his theory of ground rents. According to Marx, the quality of land differentiated productivity among farms, with those owning higher quality lands accruing more products and profits (Basu, 2018; Marx, 1976). A large part of the recent debate has also been occupied by the size of farms and relative productivity. But now farm size not only determines the output, but the relation between the inputs as well.

Agricultural productivity cannot be understood from the mere point of view of the input-output ratio. Rather, it is the relation between the factors of production that determines the nature of productivity. The theory that smaller farms have higher

productivity can similarly be debunked. There are other factors related to small farms that may result in higher productivity, rather than just the farm size (Ellis, 1993). For instance, smaller farms tend to use more labor and utilize more lands compared to large farms, which may result in higher productivity. Large farms may have low motivation to improve unfavorable lands compared to small farms, which also plays a role in determining productivity.

Furthermore, the focus on increased use of machines and modern inputs may give way to unsustainable production. In order to raise productivity, farmers, regardless of farm size, rely on increased use of fertilizers and pesticides, putting a heavy toll on the environment (the sustainability of agricultural production is discussed in Chapter 6).

Agricultural labor supply is another factor of production that significantly determines the output. With structural transformation in process in many developing countries, there is a shift of surplus labor from agriculture to the manufacturing and service sectors. As a result, the scarcity of labor can significantly dent outputs. Wage laborers are required for both small and large farms, and hence the wage for labor can determine the cost of production in addition to other production factors.

Capital in agriculture is not limited to the financial assets used in production, but also includes any physical assets used in production. Having higher capital stocks allows a farmer to invest in factors of production like fertilizers and irrigation. Financial assets can be used to buy physical assets like a tractor and irrigation equipment, which can later be used in production. Primarily, agricultural credit works as a determining factor for production. Another crucial factor of production is institutions (discussed broadly in Chapter 4).

The relation between farm size and productivity has been debated and results have been varying. There is a huge literature exhibiting an inverse relation between farm size and productivity. There has been strong opposition to it as well, demonstrating a positive relation between farm size and productivity. This chapter revisits the debates, being guided by three propositions: (a) Landholding does not always lead to concentration of land; (b) larger landholdings do not necessarily result in greater productivity or investment in land; and (c) smallholders produce at suboptimal levels with a ceiling on their level of productivity. If the latter were the case, fragmentation could be seen in a positive light with regard to productivity; as larger farmers break up their land into smaller parcels, overall productivity should have increased. The propositions are looked at using data from the survey conducted in the selected villages. At the same time, the discussion will also take into account the other key factors of production, which have gathered significant interest since the Green Revolution. Combining the land relation with the factors of production provides a holistic view of farm productivity.

The claims of the mainstream consensus on the inverse size productivity thesis and superior techniques hypothesis are juxtaposed against the findings from national and field survey data in order to discover to what extent these are useful in an analysis of land

relations and stalled productivity growth in Bangladesh's agriculture. The national data, field survey, and interviews are complemented by a series of experiments to find out the implications of fragmentation of land in terms of yield, mechanization, and cost of production to illuminate inconsistencies between existing research and empirical findings.

The political economy and neoclassical traditions in general converge on the assumption that given the appropriate conditions, success in rural accumulation strategies requires ownership of, or control over, land. The political economy tradition on the agrarian transition and capitalist transformation posits that sufficient conditions allow for forms of accumulation and concentration of landholdings by the landed elite, enabling land concentration and the differentiation of the peasantry. In other words, those who own land and are able to hold on to their land during this transitional phase will over time acquire more land, which in turn will generate the creation of a capitalist farming class alongside a majority of workers who will rely on their labor for their survival. The overall impact of the transition in agriculture is a transition in the national economy as a whole, as society moves into a capitalist mode of production.

Marx (1976), however, identifies three distinct, yet interrelated processes—differentiation of the peasantry, primitive accumulation, and the capitalist transformation. According to Brenner (1976, 1977, 1986) and Wood (1999, 2002), following Marx, the process of development of capitalism is facilitated by various forms of coercion. A crucial part of their analysis is that increasing productivity is the key to understanding capitalism, and that can only be understood in terms of the factors compelling productivity increases.

In stark contrast to the neoclassical tradition, the strength of this argument is its core focus on the historical and political aspects of agrarian change. While land concentration and the capitalist transformation result in growing productivity, they also recognize that the growth in productivity does not happen beforehand to drive the concentration of land through market processes alone. Thus, Brenner and Wood argue that trade alone cannot explain the emergence of capitalism, but rather the emergence of capitalism has to be explained by political processes driven by class power. The class structure, once established, determines the course of development of an economic system, and the evolution of the latter is determined by the class structure that emerges as the outcome of class struggle. The political economy approach, unlike other strands, thus focuses on the political processes that determine the evolution of the agrarian system. The organization of power—based on monetized or nonmonetized factors—is essential to understanding the evolution of land relations and accumulation in Bangladesh.

The neoclassical position is that land ownership and land markets should lead to land transfers to more efficient users, and this can result in land concentration, but it is based on a different set of assumptions about the conditions that are required for the transition to a more productive or capitalist agriculture. Within a neoclassical framework, the agrarian transition to a modern capitalist structure is understood as the result

of success or failure in constructing efficient markets under the assumption of rational individualism, profit maximization, and access to information. According to this strand, land productivity and capital accumulation, therefore, take place when the barriers to efficient markets are reduced or eliminated. As a result, reforms in agriculture are always directed at institutions to “free up” the market. The evidence to support this comes from a theoretical and historical analysis of the “success” of Europe’s capitalist transition. On the other hand, neoclassical approaches applied to the non-Western world are often criticized for being *ahistorical*, ignoring historical development as well as the context of local political economy.

While these traditions are concerned with how agrarian economies transform and internalize capitalist structures, the Chayanovian framework (1966) in relation to peasant agriculture refutes the idea that a transition must necessarily occur at all. Instead, populists (and neopopulists) argue in favor of the viability of a “sustainable” peasantry within a capitalist system, whereby agricultural production is static in form and isolated from capital accumulation. The neopopulist perspective is central to the debate on the role of demographic differentiation in the agrarian transition. Chayanov’s model of agrarian communities assumes that demographic differentiation does not predispose agrarian communities to a capitalist transition. Instead, peasant communities are insulated from economic transition because peasants seek subsistence, and the institutional framework is dominated by the family smallholding. Chayanov’s theory explains socioeconomic differentiation among the peasantry in terms of demographic variation between families: Only biology ultimately determines the size and capitalization of the farm. Chayanov assumes that peasants aim to secure a minimum standard of livelihood and do not attempt to expand production further once family needs have been satisfied. Chayanov assumes that there is a different peasant rationality rooted in “laws of subsistence motivation,” which contrasts with the drive to accumulate and to compete, as this is understood in Marxist tradition. Chayanov’s theory, based on the specific structure of the peasant economy, assumes the application of nonwage family labor to the household, independent of commodity production. The evidence to support these claims comes from Chayanov’s observations of the experiences of the Russian peasantry.

Drawing on Chayanovian theory for inspiration, neoclassical neopopulists (NCNPs) recommend political land reform. Unlike Chayanov, the NCNPs believe in the inverse size-productivity theory of agricultural production whereby smaller farms are understood to be more efficient than larger farms. The NCNP framework claims that agricultural transition may not be happening in many parts of the world because large landowners possess a monopsony in the labor market, and they do not want to sell land to hurt their profitable monopsony even if more efficient smallholders are willing to pay more for the land. This prevents a consolidation of landholdings in the hands of smallholders. The NCNPs, therefore, recommend the compulsory transfer of land from

large landowners to smallholders or the landless. Chayanov’s theory was based on the rural Soviet Union, now Russia, where land was sufficiently available. In developing countries like Bangladesh, India, and Thailand, labor is in abundance, but the amount of land is insufficient. The average farm size in Bangladesh is 0.5 acre, whereas the average size is 444 acres in the United States (USDA, 2020). The size has only been decreasing in Asian countries. Hence, peasants in developing countries are restricted by their farm size in increasing their productivity.

LAND TRANSACTIONS THROUGH LAND FRAGMENTATION

Land fragmentation is increasing, not because of the greater productivity of smallholders but because of demographic forces. Land fragmentation is conditioned upon the state of population. An increase in population will lead to a decrease in average land size. Hence fragmentation occurs. Suppose that,

A = amount of crops per acre of land

L = amount of land

P = population

$$\frac{dL}{dt} = \frac{1}{\alpha} P \dots\dots\dots (3.1)$$

$$\frac{dL}{dt} = \beta L \dots\dots\dots (3.2)$$

$$\frac{dA}{dt} = \beta L \dots\dots\dots (3.3)$$

α = rate of increase of the population and

β = rate of change of the cultivable land

An inverse relationship between the population of a country and the amount of land is denoted in Equation (3.1). As the population increases, that is, with the increase of α , the amount of land decreases. Thus, a proportional rate of decline in land is observed in Equation (3.2). With the decreased amount of land, productivity declines as fewer crops are produced per acre of land. So, in a nutshell, it means that productivity has an inverse relationship with population, and takes the form of:

$$\text{Productivity} \propto \frac{1}{\text{population}}$$

Land Fragmentation

Turning to the empirical evidence in Bangladesh, the majority of landowning households surveyed and interviewed in all villages could not increase their landholdings for a range of reasons. The most profound one, cited by almost every respondent, is the demographic changes or fragmentation arising out of the process through succession of land ownership among family members. In the field investigation, all households who were interviewed owned some parcel of land, but only a very few households are expanding their ownership in any noticeable proportion. This is no surprise, considering that Bangladesh's agrarian structure is only partially differentiated, as opposed to the Western world where the majority were forced into labor contract relationships with the owners of the means of production through processes like the enclosures. During the Georgian era, a period in British history from 1714 to 1830–1837 when four kings named George ruled, the process of enclosure created a landless working class that provided the labor required in the new industries developing in the north of England. In agriculture the years between 1760 and 1820 are the years of wholesale enclosure in which, in village after village, common rights were lost (Thompson, 1991).

Landlessness is growing in Bangladesh, but this is more as a result of demographic and ecological factors than the kind of transition seen in the early capitalist transformations in the Western world.

The national trend also suggests that the number of large and medium farms is declining while the number of small farms is on the rise (Table 3.1). Large farmers in particular have seen a significant decline, reduced in number by almost three fourths between 1960 and 2005. Between 1983 and 2008, the number of large farmholdings was halved to 0.23 million from 0.50 million (BBS, 2010). The same decline is seen in the medium holding category. These declines have resulted in the growth observable in small and marginal holdings. In the smallholder category, growth has been on a steady path. Between 1996 and 2005 the number of smallholdings more than doubled.

TABLE 3.1 Farmholdings

FARMHOLDINGS	1983/84 (MILLIONS)	1996 (MILLIONS)	2008 (MILLIONS)
Small farms (0.5–2.5 acres)	7.07	9.42	12.53
Medium farms (2.5–7.5 acres)	2.48	2.08	2.11
Large farms (7.5+ acres)	0.50	0.30	0.23
Average farm size	0.81	0.60	0.50

Source: Bangladesh Bureau of Statistics (BBS) (2010).

As members of families holding a medium or large parcel of land increase, such land is fragmented into smaller parcels to distribute among heirs, primarily to sons, thus creating more owners with less land per individual or household. This is clear evidence of fragmentation. According to the population census of 2011, Muslims constitute 90.4% of the population while Hindus are 8.5%. In Bangladesh, the rules of the respective religions are applied to succession and inheritance. In the case of sons and daughters the proportion is 2:1 in Muslim families, but in certain cases the brothers do not transfer lands and properties to sisters. The *Dayabhaga* school of law governs the system of inheritance for Hindus in Bangladesh, as opposed to the *Mitakshara* school of Hindu law, in which the son acquires the right to the ancestral property just after birth. Only five classes of women inherit in the *Dayabhaga* system: wife, daughter, mother, father's mother, father's father's mother. But these women inherit only when living, that is, they are owners with limited rights and on their death the property would pass to the nearest male heir of the deceased male owner and not to the heirs of the female heirs. The woman or women inheriting can sell the property when living and that too only for limited legal necessity.

Land fragmentation could be elucidated in a different perspective in terms of use of lands. The total area operated by large landowners declined dramatically from 38% to 10% between 1960 and 2008. Some of the fragmentation of smaller farms has contributed to the smaller rate of change observed in the class of medium farms, which has declined, also rather incrementally over the decades, from 45% to 30%. The percentage of farms that these large and medium farms make up is roughly 12% of the total number of farmholdings in Bangladesh, with marginally over 1% being large holders. As a result of this downward shifting, smallholders have increased substantially, from making up only 27% of total farms and owning a small 13% of total land in 1960, to 50% of the farms as well as occupying half of the total area in 2008. The scenario is very similar in developing states where the average size of farms has been declining. This is largely evident in Asian countries. In Latin America and high-income countries, the trend in the average size of farms has been upward sloping, meaning the average size of farms has been increasing. The shrinking farm size in Asian countries has resulted in an increase in small farmholdings. Globally, there are more than 570 million farmholdings, of which small farms constitute an overwhelming 475 million holdings. Sixty-five percent of global farmholdings are in China, India, Bangladesh, and Indonesia, where the majority are small farmers (Lowder et al., 2016).

Land fragmentation is also conspicuous in terms of increase in the number of total landowners. Between 1960 and 2008, the number of owners increased sixfold, while the average size of land held decreased to a corresponding one-sixth of the previously held quantity. The average size of farms decreased to 0.50 acre in 2008 from 0.81 acre in 1983, showing a 38% decline in 25 years (Table 3.1). Though not in dramatic fashion,

the same has happened in the owner-cum-tenant category. The number of tenants has also increased at a higher scale and corresponds to increasing landlessness. Tenants have also grown in number as their holdings decreased, implying that competition over land is increasing and that landowners are unwilling to sell their land. The discrepancy between the operated areas held by landowners versus landowners who also are tenants has increased over time. In effect, farmers are counteracting the effects of fragmentation by gaining access to land in a tenurial relationship as they supplement their increasingly small parcels of land with land that is either sharecropped and/or leased in.

Although the number of smallholders has been proliferating while the number of large landowners has been reduced over the years, inequality in landholding widened. With roughly 50% of the population, including the landless, owning 50% of the land, this should have resulted in a high level of equality. But on either side of this are marginal farmers, making up 40% of the total number of farmers and sharing a meager 10% of total land, and the middle and large farmers, who together comprise the other 10% of the farm population, but account for 40% of the land.

The increase in number of households has a positive correlation with increasing land fragmentation. The number of landowners increases as population increases, and fragmentation occurs over time. In Bangladesh, fragmentation of land as families expand is a much more powerful force than any movement of a productive or powerful landowning class toward concentration. Thus, fragmentation is dominant more than anything else, a condition that is not easily counteracted. Tenancy arrangements have become more prevalent, witnessing a 23.3% increase between 1996 and 2005 (Table 3.2).

In the four villages, the size or area of land ownership has decreased while subsistence farmers resort to sharecropping and/or lease in from other, larger farmers for cultivation (Figure 3.1). Most of the families had been the recipients of ancestral lands—land passed down within the family. This is found in the studied villages of Comilla, Tangail, and Bogra but less so in Noakhali where so many households suffered from land loss due to river erosion. The land ownership shifts so much in the Noakhali region that transactions are more frequent concerning larger tracts of land.

TABLE 3.2 Change in Pattern of Tenancy per Household in Bangladesh, 1996–2008

TYPE	1996	2005	% CHANGE	2008
Holdings owning no land	1,814,571	1,307,700	-27.93	1,508,876
Owner holding	11,807,551	18,280,440	54.82	18,734,787
Owner-cum-tenant holding	4,206,072	5,934,968	41.10	6,278,282
Tenant holding	1,814,595	2,238,201	23.34	3,682,694

Source: BBS (1986, 1999, 2007, 2010).

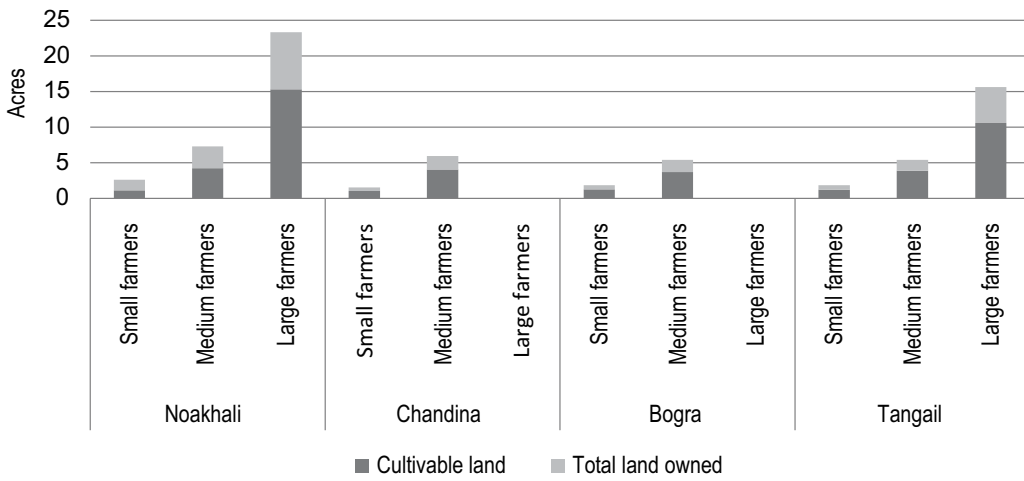


Figure 3.1 Average land held per household (acres). (Source: Field survey.)

Large farmers in particular are gaining land in this area due to primitive accumulation as many of these individuals may be categorized as “outsiders,” people coming from outside the village areas to purchase and/or grab land with money, muscle, and power.

In Comilla, families could often trace back their lineage within the same locale for many generations. In cases of the large landholders, fragmentation of land over time is occurring at such a rapid pace that any accumulation of land or concentration could not happen at a rate that could possibly match or negate the effect. Although many large households acquired land, their total landholdings are still less than the quantity of landholdings their preceding generations had. This trend of fragmentation was recorded by almost all respondents. In addition to the evidence of national and field survey data, the unequivocal response to the obstacle to land consolidation was that of overpopulation.

Unlike in advanced countries, smallholders are the primary tenants on others’ land, implying that land is not being transacted (bought and sold) between less and more productive users, as the neoclassical interpretation would predict. As land is so closely linked to power, successors hold on to their land, knowing full well that they will not farm by themselves, resulting in sharecropping and/or leasing out of land rather than selling it. These arrangements do not yield the same results as it could have been otherwise from large-scale farming using economies of scale in production. Findings from the field suggest that tenancy is a less productive scenario while farmers who were both tenants and owners, or who shifted from cultivation dominated by tenancy to cultivation on owned land, witnessed increases in productivity.

When asked to comment on the difference between working on the land in the past as compared to the present, almost all respondents said that the current situation is more difficult as there are more people to share the fixed amount of land, costs of inputs

have been on the rise, and more inputs are required for the same acreage. This trend is widespread in Bangladesh and thus arguably supports Chayanov's theory of "demographic differentiation," by which he means that as families expand and contract, landholding corresponds with the availability of family labor as such, and landholdings and the well-being of the family shrink or expand in relation to the size of the household.

While identifying the main causes of land fragmentation in the selected locations, 96% of the respondents answered that population growth was the major reason behind land fragmentation. A relatively small number of respondents (4%) argued that land fragmentation occurs because of soil erosion due to riverbank erosion, heavy rainfall, and so on. Thus, the demographic variable is the primary cause of fragmentation. This is also matched by the national data.

Land Transactions and Productivity

Much of the debate around agricultural development and productivity has pivoted on the inverse productivity hypothesis, which holds that smaller farms are more productive than larger ones (the debates relating to such contestation were mentioned in Chapter 2). A comparison of the productivity of small and large farms is made to assess whether, according to neoclassical logic on transition, land is being transacted to the most productive users. This also challenges the neopopulists' assertions that smallholders are more productive. The section also demonstrates that nonagriculture income plays a significant part in land transactions, which are significantly financed out of savings, and these neither induce higher productivity nor create a productive class of farmers. These lands in most cases are then given out in sharecropping, which results in less than optimal productivity.

The question then becomes: Why, in general, do small farms have higher yields than large ones? Those in favor offer an argument about differences in relative prices and in access to resources while the opponents reject it. There are issues that require further elaboration. First, the inverse relationship can be found in regions dominated by large commercial farms. Second, if high yields on small farms are caused by the threat of starvation and the consequent "self-exploitation" of the peasantry, it is difficult to explain why in some cases yields first rise as size of farm increases before beginning to fall. Third, the starvation argument at best has only limited applicability and clearly does not hold in areas of the world where smallholders are not on the verge of starvation. The inverse relationship, in contrast, is much more widespread and can be found, as critics imply, in poor regions of the world but also in much more prosperous regions such as Latin America.

The present study finds that land transactions are not occurring in a way that facilitates capitalist development as happened in the West, since land is not being shifted from less to more productive users, and overall productivity has remained suboptimal.

Large landholders are not actually holding “large” parcels of land, nor is there a monopoly in the labor market in the way neoclassical neopopulists posit, which impedes the efficient transfer of land to more productive users. Nor is there any evidence to suggest that large landowners are trying to prevent sales of land. Nor are smaller farms being consolidated. Rather, the distribution of landholdings is not changing in the direction of more productive farmers, be they large or small. There is a constant and gradual increase in fragmentation, as well as “churning.” If a dynamic framework is considered, over time, with increasing land fragmentation, for whatever reasons, productivity could increase if there were a strong inverse yield relationship. However, productivity remains in a steady state at a suboptimal level in Bangladesh.

Of the 8.6% high productivity land (HPL), none is owned by the large farmers. About 82% of HPL is cultivated by smallholders. Among this group 55% of the land is owned and 45% is leased. Of the 75% moderate productivity land (MPL), 70.5% is cultivated by smallholders, 24.3% by medium farmers, and 3.8% by large farmers. Forty-nine percent of MPL is cultivated by the owners and the remaining 51% is leased in or mortgaged out. Of the 16% low productivity land (LPL), 75.4% is cultivated by smallholders, 26.9% by medium farmers, and 3.8% by large farmers (Table 3.3).

In each of the four villages on average more than two-thirds of the land is concentrated to smallholders. About four-fifths of these lands exhibit low productivity. In villages like Char Lakshmi in Noakhali, which is relatively backward and where primitive accumulation has been taking place, and in villages like Dastika in Bogra where traditional agriculture is in place, productivity is lower compared to the villages in Comilla where technological adoption in agriculture is high and the villages in Tangail where financial deepening is developed (Table 3.4). In contrast to the argument that smallholdings lead to higher productivity, however, findings suggest that, though not at a significant level, villages in Comilla and Tangail have higher land productivity despite having a low rate of land fragmentation compared to those in Noakhali and Bogra where land fragmentation is relatively high. While fragmentation certainly explains the lack of concentration, it does not as adequately explain lower productivity.

TABLE 3.3 Type of Land and Usage by Size (percent)

	HIGH PRODUCTIVITY LAND	MODERATE PRODUCTIVITY LAND	LOW PRODUCTIVITY LAND
PERCENT OF LAND	8.6	75.0	16.0
LARGE FARMER	—	3.8	3.8
MEDIUM FARMER	18.0	24.3	26.9
SMALLHOLDERS	82.0	70.5	75.4

Source: Field survey.

TABLE 3.4 Land Transactions in Four Villages (acres)

NOAKHALI			COMILLA			BOGRA			TANGAIL		
SMALLHOLDERS	MEDIUM FARMERS	LARGE FARMERS	SMALLHOLDERS	MEDIUM FARMERS	LARGE FARMERS	SMALLHOLDERS	MEDIUM FARMERS	LARGE FARMERS	SMALLHOLDERS	MEDIUM FARMERS	LARGE FARMERS
1.58	2.20	6.50	0.48	1.80	—	0.75	1.47	—	0.89	1.65	3.80
1.40	3.06	8.01	0.50	1.92	—	0.60	1.74	—	0.62	3.80	5.04

Source: Field survey.

In contrast, productivity was quite low across all categories in the village of Tangail, which may be linked closely to the high proportion of migrants (absent men) and the effects of remittances. The result was the inflow of enough wealth to invest in purchases of land but not a compulsion to be productive on it. The productivity in Noakhali was particularly low. This can be attributed to the highly unequal distribution of land, lack of access to inputs and markets, and a challenging natural environment.

In Srimantapur, medium farmers produce for their own development, but smallholders produce more than medium farmers because they have to meet two objectives—survival and their own development. The observation here supports the GKI assumption that smallholders are more productive, yet it makes an important distinction between productivity for the sake of productivity, that is, signifying a capitalist impulse to accumulate, and productivity that is driven by desperate need, where no such capitalist impulse is in evidence. Moreover, it is important to acknowledge that smallholders may be more productive because of their small scale yet have a cap on how productive they can be.

In Tangail, where remittances have flooded the community and are being funneled back into land ownership and mortgaging arrangements, productivity is relatively low. Indeed, farmers explicitly state that their primary reason for purchasing land, using remittances as the main source of funding, is not to increase productivity, and they are not interested in transforming land from savings to investment.

While there is no large discrepancy between the productivity of small and large farmers in Tangail, medium-sized farmers are the least productive, and the productivity of the area is low compared to other villages. Land transactions are, however, more frequent and have led to some concentration of holdings. In the last 36 years, medium and large landowners have doubled the amount of land that they transact on average (Table 3.4). As farmers gain access to income from outside agriculture, they buy and rent/lease/mortgage more land, but they do not engage in such transactions out of a

compulsion to raise productivity, but to use land as a store of value. For example, 61.5% of land was bought using remittances, but only 38.5% of farmers stated that they bought land to increase productivity.

Tenancy relations overlapping with land ownership doubled the land under cultivation per smallholding farming household (Table 3.5). This should have driven increased productivity because it seemed that more productive households were leasing in land. But this was not the case found in the fieldwork. The intensity of the mortgage market depends on farmers leasing out land to facilitate investments elsewhere. Most commonly, land was leased out to invest in migration. In turn, remittances were used to pay off loans and reclaim the land. Until this was done, the land remained under the operation of the lender. As such, land is not being transacted for productivity-enhancing cultivation but for potential future investments outside agriculture. Often the mortgager, unlike a lessee, simply sharecrops out the new land under his control. In contrast, in Comilla, large landholders have broken through the ceiling on productivity imposed by scale and size constraints; they are able to produce six times what a medium farmer can in the second crop.

Changes in asset composition have occurred dramatically in the last two decades, especially with reference to the role of migrant laborers and remittances. The use of nonagricultural earnings to purchase more land underscores the importance of looking beyond the assumed positive relationship between land ownership and land acquisition. In many families, nonagricultural variables such as earnings from business or remittances were absolutely crucial for the ability to purchase more land. Investments were made in these areas of economic life with the direct intention to buy more land. For example, a family may lease or mortgage out the parcel of land that they had been handed down from their ancestors in order to finance sending a son abroad to work as a migrant laborer for several years. Earnings sent back from the son to the household are then funneled back into an investment in land, normally in the form of increased landholdings. In Bara Pakhia where two or three members of each household were involved in the international migrant labor market, this trend was widespread.

In a similar vein, land transactions and productivity in the village of Dastika were heavily shaped by the marked nonagricultural variables the landholders had access to

TABLE 3.5 Average Land Held per Household (acres)

TANGAIL	TOTAL LAND OWNED	CULTIVABLE LAND
Smallholders	0.62	1.22
Medium farmers	1.52	3.87
Large farmers	5.04	10.60

Source: Field survey.

through business activities. Because the village is so closely located to an industrial and business hub, landowners could diversify their earnings in such a way as to inhibit the compulsion to produce enough through agriculture to create a surplus. Indeed, most of the respondents said their foremost concern is successful subsistence farming—growing enough rice to cut down household expenses for the year. To the degree that earnings from nonagricultural activities facilitated this, productivity was enhanced, but commonly only up to the point of meeting needs and not beyond.

While land in and of itself was not always positively correlated with the acquisition of more land, it was still an extremely important variable in the “advanced village” setting. Land is being constantly used to leverage opportunities elsewhere, which in turn may lead to further investments in land. When asked about the continued importance of land, in the face of the increasing importance of migrant labor, and despite the extreme fragmentation noted by all, respondents unfailingly responded in the affirmative. No matter how important these other, nonagricultural variables are, or would become, land is always treated as a sound investment. It is, however, not generally considered a sound investment on its own, but in relation to other economic activities. In other words, land is still upheld as the most important store of value that a household can have. Reportedly, most households invest in land and hope that their sons will continue to own land. They do not, however, stress that their sons should be actively working on the land themselves; rather, it would be better for them to be educated, work in businesses other than cultivation, or invest in migration.

The belief that cultivators endowed with sufficient resources would unreservedly respond to the presence of new opportunities (for example, those presented by technological change) springs from two core assumptions, which may be incorrect with relation to the transitional agriculture in Bangladesh. First, it assumes that producers respond to market signals, and second, that the preexisting organization of production is flexible. Households that had access to nonagricultural resources are more likely to acquire more land, in addition to expanding their investments in other areas. However, these assumptions turn out to be questionable.

In Char Lakshmi, the landowners defined as large by official standards treat their land as an investment in a future store for value—and as a way to cut down household costs. A landowner with 10 acres would, for example, work 3 acres himself (or rather, hire laborers while he attended to his business or other activities) to produce enough to feed the family. The rest of the land would commonly be sharecropped out. The large farmers find sharecropping is the preferred arrangement in this area as sharecropping yields maximum productivity, given the least amount of time and effort it requires for the large landowners.

Another strand of literature suggests that other factors like superior techniques and land quality explain productivity differences in one or other of three categories:

TABLE 3.6 Sectoral Productivity Ratios

SECTORAL PRODUCTIVITY	1999–2000	2002–2003	2005–2006
Agriculture	1.28	1.052	1.16
Manufacturing	5.13	4.450	2.39
Services	3.46	3.220	3.43

Source: Author's calculation.

Note: Relative sectoral productivity is measured as the ratio of the share of sectoral output to share of the sectoral labor force.

(a) differences in techniques—smallholders use technically superior methods of production; (b) qualitative differences in factor endowments (either land or labor on smaller farms is intrinsically of a superior quality); and (c) more intensive use of co-operant inputs like labor, bullocks, or irrigation (Sen, 1964). One aspect of Sen's argument draws on a Malthusian logic of higher incomes leading to larger families, successively breaking into fragments so that better quality land is in smaller holdings. Another explanation attributes the poorer productivity of land on larger holdings to the possibility that these holdings are characterized by a higher degree of fragmentation of the plots constituting the holding (Bhagwati & Chakravarty, 1969). Apart from these arithmetic possibilities, if the size–productivity relationship held in Bangladesh, the proliferation of smallholding agriculture should have resulted in increased productivity. What is observable is the reverse. At a national level productivity has plateaued (Table 3.6), with agricultural growth relatively stable at around 2.9% over the past three decades.

The more intensive application of labor by smallholders in addition to the increased productivity stemming from the use of modern technology has not led smallholders to be more productive on average than large farmers. A study in southern India saw similar results, where land fragmentation negatively impacted productivity and profit, even though small farmers are always more efficient in using factors of production (Manjunatha et al., 2013).

Hence, the small and marginal farmers grow much of the total hybrid rice in the country, yet such use has not allowed the country to break out of the low-level productivity trap, meaning answers to such low-level equilibrium have to be sought from different explanatory variables (Table 3.7). Instead, this exemplifies Byres's (2003) argument that the “very survival” of smallholders requires that they apply large quantities of labor, yet, even so, their circumstances are such that they are pushed “down to bare subsistence.” This view is echoed by the argument that smallholders apply “huge amounts of very low productivity labour to tiny parcels of land,” in part because they face “acute risks of starvation that necessitate the severe exploitation of all family labour” (Sender & Johnston, 2004).

TABLE 3.7 Cropped Area of Farming

	TOTAL FARMHOLDING	MARGINAL FARMERS	SMALL- HOLDERS	MEDIUM FARMERS	LARGE FARMERS
TOTAL AUS (ACRE)	2,670,787.00 (8.90%)	191,201.00	1,313,257.00	904,061.00	262,267.00
LOCAL AUS (%)	57.66	5.76	46.49	36.73	11.02
HYV AUS (%)	42.34	9.06	52.82	29.93	8.19
TOTAL AMAN (ACRE)	10,488,754.00 (34.97%)	6.44	48.20	33.52	11.83
LOCAL BROAD- CAST AMAN (%)	8.79	5.90	48.82	34.73	10.55
LOCAL TRANS- PLANTED AMAN (%)	40.17	5.68	44.32	36.17	13.83
HYV AMAN (%)	49.96	7.14	51.21	31.25	10.40
HYBRID AMAN (%)	1.08	7.13	48.65	30.36	13.86
TOTAL BORO (ACRE)	9,272,497.00 (30.91%)	7.28	51.65	30.69	10.38
LOCAL BORO (%)	11.16	5.52	43.66	35.01	15.82
HYV BORO (%)	85.06	7.55	52.81	30.01	9.63
HYBRID BORO (%)	3.79	6.39	49.03	33.34	11.23
WHEAT (ACRE)	8,97,403.00 (2.99%)	69,010.00	459,126.00	288,583.00	80,684.00

Source: BBS (2010).

This is found to hold in other fieldwork-based studies. For instance, Toufique (2001) finds that in more “advanced” rural areas, where capitalist modes of production were practiced, larger farms were more productive than small farms. The inverse size productivity argument is held only in the “backward areas” of his study. The “inverse-size productivity relationship” is therefore not valid as a point of argument in Bangladesh, and arguments for redistribution of land from larger to smaller farmers are thus weak. Similarly, the productivity gap between small and large farms is mostly being narrowed down in both Bangladesh and West Bengal as the relative strength of large farmers has been strengthened to blur the inverse relationship generally observed under traditional technologies. And in both Bangladesh and West Bengal, savings and/or surplus are substantially higher for larger owners, although they spend a lower percentage on productive investment (Saha, 1997). Khan (2004) associates the inverse relationship with “proto-capitalist farming,” ascribing it “only to . . . backward regions.”

As smallholders have collectively reached a ceiling on their level of productivity at the national level and as this trend is also confirmed at the village level, the

lagging productivity can be explained through arguments about demographic and decision-making processes in relation to land transactions. First, agricultural productivity is stalled because of land fragmentation caused by a demographic explosion that has caused landlessness (too many people, too little land). It is further undermined by climate change and land degradation (linked indirectly to the population problem). The precarious conditions created by these factors are exacerbated by the absence of adequate growth-promoting institutions and technical change, and political instability and corruption.

These trends not only highlight the importance of demographic factors, but also go deeper to examine more closely the factors that dominate the debate on productivity or lack of productivity in farming. The majority of purchases are financed by nonagricultural incomes such as from business ventures or remittances (Ullah, 1996), meaning that land transfer is not directed by productivity differences, as the neoclassical argument would assume. The assumption of the neoclassical school is that land is purchased primarily because the buyer can use it more productively than the seller. Increasingly in Bangladesh, and particularly where incomes have been diversified outside agriculture, investment in land is treated as a store of value rather than as a factor of production to generate income directly through enhanced productivity.

Fragmentation, Size, and Productivity: Results from Experiments

The effect of land fragmentation on crop production depends on the shape and dimension of the plot and on agriculture practices. Both labor and machine productivity gradually decrease (dY) with increasing land fragmentation (dX), and the cost of production follows a rapidly increasing trend compared to the baseline cost of production (Figure 3.2). Fragmentation is found to be a restrictive factor of agriculture production (Dijk, 2003; Kopeva et al., 2002; MacPherson, 1982; Rahman & Rahman, 2009; Swinnen, 1997). With lands becoming smaller, use of labor and machineries exhibit a declining trend due to diminishing returns. The cost of production, on the other hand, increases significantly as the diminishing returns from labor and machines limits the output. The gap between cost of production and input efficiency hence widens as lands become more fragmented.

The smaller farmers have higher productivity but only within a very narrow range of productivity. Small farms have higher productivity than large farms but only for a certain period as in the long run large farms gain more because of technology and higher capital. Output is a function of land, labor, capital, and technology. Limited land area constrains the use of technology in smaller farms. Productivity is a function of land, technology, capital, and labor. So, without these four elements productivity is not possible.

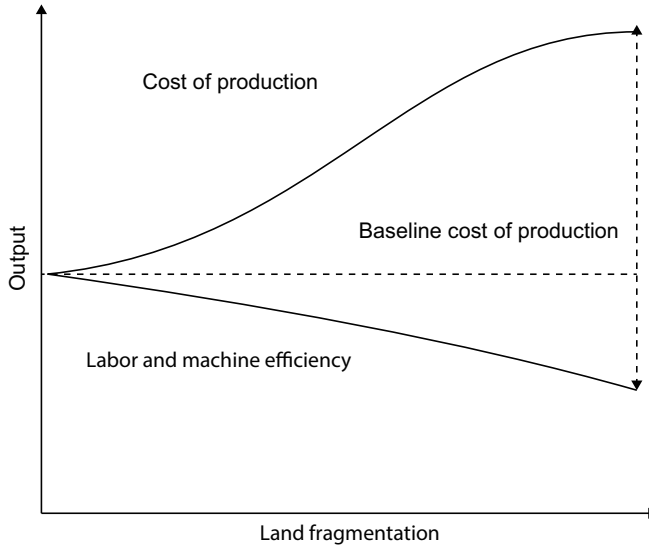


Figure 3.2 Land fragmentation and cost of production.

Assume that,

- L = land
- B = labor
- C = capital
- T = technology
- P = amount of crop per acre

$$P = f(L, B, T, P) \dots\dots\dots (3.4)$$

The above statement is illustrated through Equation (3.4).

If productivity has an inverse relation with the size of the land, it takes the following form:

$$\text{Productivity} \propto \frac{1}{\text{size of the land}}$$

CASE 1: WHEN THE SIZE OF LAND IS SMALL

Here, necessity of technology \propto size of the land, capital \propto size of the land, and labor \propto size of the land. So, if the land size is small in a way that the farmer can provide for the labor, capital, and technology himself without any help from outside, there is no cost of labor, capital, and technology. So, the productivity seems to be optimal. But in reality, such is not possible, for a farmer has to be engaged for other necessities and/or might not possess all the necessary requirements for these factors of production. Under such circumstances, the optimal production lessens, resulting in productivity that is suboptimal.

CASE 2: WHEN THE LAND SIZE IS VERY LARGE

$$\frac{dP}{dt} = \alpha I \dots\dots\dots (3.5)$$

$$\frac{dI}{dt} = \beta L + \gamma B + \delta C + \mu T \dots\dots (3.6)$$

Here,

- α = rate of change of investment
- β = rate of change of land
- γ = rate of change of labor
- δ = rate of change of capital
- μ = rate of change of technology

Equation (3.5) denotes that the number of crops per acre depends on the rate of investment. And the rate of change of investment depends on the rate of change of land, labor, technology, and capital.

Suppose that M = price of the uncultivated land. In a real-life situation, $M \propto t$ where t = time. This implies that the price of the uncultivated land increases with the passage of time, so uncultivated land acts as a saving for the owner. So instead of financing for irrigation, they decide to keep the land uncultivated. As a result, in Equation (3.6) β decreases. Consequently, investment decreases and so does production.

* * *

The increased cost of production and loss of output have been estimated under different scenarios of land fragmentation. The loss of yield emanating from loss of land due to demarcation (*ail*—boundary lines of plots) has been estimated. This is followed by an estimation of machine productivity by taking consumption of fuel and time use of power tiller as a proxy for mechanized agriculture. This has been done by estimating the time required for a country plow for cultivation and leveling of fields in the case of traditional agriculture.

Different combinations of land fragmentation were estimated (see Table 3.8). When a 7-*katha* (11.69-decimal) plot is divided into two plots of 3 *kathas* (5 decimals) and 4 *kathas* (6.70 decimals) by a single *ail*, with a length of 14.2 m and width of 30 cm, 4.26 m² land is lost due to the demarcation line, which is 0.91% of the total land area. During the field survey the maximum width of an *ail* was found to be 30 cm while the minimum was 15 cm. In such cases, 9 kg of yield of rice is lost, which is 4.6% if compared with local level production (i.e., the average level of production at the study area), and as such results in a yield loss of 7% if compared with the national average level of production.

TABLE 3.8 Effects of Land Fragmentation on Cultivable Land and Rice Production

AREA		LAND DIVIDER (AIL)		LAND LOSS		YIELD LOSS				
M ²	DECIMAL	KATHA	AREA (L × B)	AREA (M ²)	LOSS OF LAND (M ²)	% OF LAND LOSS	YIELD LOSS (KG)	% OF YIELD LOSS*	NATIONAL AVERAGE	LOCAL AVERAGE
468.30	11.69	7(4+3)	14.2 m × 30 cm	4.26	4.26	0.91	9.00	7.00	7.00	4.60
			14.2 m × 15 cm	2.13	2.13	0.45	4.50	3.50	3.50	2.30
535.20	13.36	8(6+3)	22.5 m × 30 cm	6.75	6.75	1.26	14.63	10.00	10.00	6.53
			22.5 m × 15 cm	3.38	3.38	0.63	7.31	5.00	5.00	3.26
602.10	15.03	9(5+4)	15.5 m × 30 cm	4.65	4.65	0.80	9.38	5.70	5.70	3.72
			15.5 m × 15 cm	2.33	2.33	0.40	4.70	2.85	2.85	1.86
802.80	20.00	12(6+6)	16.3 m × 30 cm	4.89	4.89	0.61	11.25	5.12	5.12	3.34
			16.3 m × 15 cm	2.45	2.45	0.31	5.63	2.56	2.56	1.67
1,338.00	33.40	20(10+10)	24.5 m × 30 cm	7.35	7.35	0.55	18.75	5.12	5.12	3.33
			24.5 m × 15 cm	3.68	3.68	0.27	9.40	2.56	2.56	1.67

1,137.30	28.40	17(5 + 4 + 4 + 4)	15.5 m × 30 cm	4.65	14.10	1.24	30.01	9.64	6.30
			15.5 m × 30 cm	4.65					
			16.0 m × 30 cm	4.80					
			15.5 m × 15 cm	2.33	7.06	0.62	14.98	4.82	3.15
			15.5 m × 15 cm	2.33					
			16.0 m × 15 cm	2.40					
2,676.00	66.80	40(11 + 10 + 10 + 9)	24.5 m × 30 cm	7.35	27.60	1.03	70.51	9.63	6.30
			24.5 m × 30 cm	7.35					
			21.0 m × 30 cm	6.30					
			22.0 m × 30 cm	6.60					
			24.5 m × 15 cm	3.68	13.81	0.52	35.26	4.82	3.15
			24.5 m × 15 cm	3.68					
			21.0 m × 15 cm	3.15					
			22.0 m × 15 cm	3.30					

Source: Author's calculation based on field experiment.

*Calculation based on BBS (2010).

When the same plot is separated by a single *ail* whose width is 15 cm, the amount of land lost from cultivation is 2.13 m², which is 0.45% of the total land area, and the lost output is 4.6 kg.

If a 17-*katha* (28.4-decimal) plot is split into four plots, with one piece amounting to 5 *kathas* (8.35 decimals) while the remaining three are comprised of 4 *kathas* (6.70 decimals) each, and demarcated by three *ails* with a width of 30 cm, 14.1 m² land is lost due to demarcation, which is 1.24% of the total land area, and thus 30.01 kg of yield is lost. If the *ail*-width is 15 cm, the loss of land is 7.06 m², which is 0.62% of the total land area, and the loss of yield is 14.98 kg, representing a 4.82% loss if compared with production at the national level and 3.15% at the local level (i.e., the average level of production in the study area).

A weighted average estimation finds a loss of 70 m² per hectare or 0.7% per hectare. More than 2 kg of rice is lost per square meter of *ail* as a result of the demarcation boundary, stemming from fragmentation of land due to hereditary succession. Moreover, fragmentation into small plots makes mechanization, particularly the use of power tillers and tractors, inefficient due to the change in the form and dimensions of the plots. Numerous parcels formed out of a big plot act as a restrictive force as well as increase the cost of production. During the field survey, 76% of farmers answered that “mechanization is hampered because of the small plots of land below 10 *kathas* or 16.7 decimals”; 68% of them answered that “mechanization is efficient if the plot size is above 1 *bigha* or 33 decimals”; and 88% said that they “lose time and fuel due to land fragmentation.” From the field experimental data, a power tiller required 16 minutes to till 5 *kathas* (8.35 decimals) of land, that is, 3.20 minutes per *katha*. In the case of 40 *kathas* (66.80 decimals) of land, a power tiller required 74 minutes, that is, 1.85 minutes per *katha*. For a large-sized plot, the rate requirement of time is significantly lower per unit of area compared to a small-sized plot. An additional 1.35 minutes are required per *katha* if the plot size is 5 *kathas* compared with a 40-*katha* plot, and on average 3 hours of productive time is lost in a working day if the plot area is less than 10 *kathas*, provided other conditions remain constant.

Moreover, power tillers cannot be used in corners of plots, leaving farmers to till the corners manually. Further time and fuel are lost as the power tiller has to be moved from one plot to another. About 2 to 3 minutes are lost when moving the power tiller from one plot to another, ignoring the time required for transportation to the other plot as well as for setting up the equipment, including clutches and gears.

Land fragmentation is also responsible for a concentrated output basket. Large farms tend to be more diversified in terms of product basket, whereas rice production is mainly concentrated in the small and marginal farmers. Diversification is low among the small farmers because of the price variability of crops, as rice tends to have a much lower risk compared to noncereal crops (Hoque & Ahmed, 2020).

TECHNOLOGY AND MECHANIZATION

Since the Green Revolution, elements like fertilizers, pesticides, modern seed varieties, and irrigation have become key factors of production that have now gone on to significantly impact productivity. Farmers have now moved away from traditional fertilizers to chemical or synthetic ones as natural fertilizers have not been able to cope with the fast pace of deterioration of the soil. At the same time, hybrid seed varieties focusing on high yields have gained popularity and raised overall production.

Labor

Labor comprises a significant part of the production relation in agriculture, particularly in developing countries. Labor supply in agriculture can be attributed to two broad types. Wage laborers work on the fields owned by others. This is a common feature in large and medium households, where household labor is not enough and thus wage laborers are employed. On small farms and in peasant households, members of the household work in their own small field.

In both cases, wage laborers are a crucial part of the production process. The supply of labor in agriculture is declining with supposed structural transformations, pulling in surplus labor from the manufacturing sector. Labor's shift to the manufacturing sector makes agricultural labor more expensive due to the scarcity of labor in the market (Hazell, 2005). Higher wage rates due to increased demand may raise the price of output. On the other hand, higher real wages in agriculture also helps in reducing poverty in rural areas.

The supply of labor is also cyclical, with higher demand in certain periods and for certain crops. Usually, the demand for laborers rises during the harvesting season. With less farm mechanization, farmers have to depend on wage laborers. An important dimension of the agricultural labor market is that it is highly informal with little bindings between the employer and the laborers.

Capital

Over the years, small farmholdings have increased, particularly in developing countries. Small farms can maintain higher productivity by employing labor from households. However, as agriculture has been witnessing increased mechanization, small farms cannot compete with large farms. As such, farmers, mainly small ones, need capital investment to maintain the productivity level. Agricultural credit in this regard is used to overcome the impediment of low capital. However, that is also constrained in most of the developing countries due to an underdeveloped infrastructure.

There is widespread agreement that agricultural credit boosts productivity. For instance, agricultural credit inflow raised the use of inputs such as modern fertilizers and pesticides. It also led to farm mechanization through the use of tractors and machines (Narayanan, 2016). A similar outcome is seen in Bangladesh and Pakistan as well (Rahman, 2011; Saleem & Jan, 2011). Agricultural credit in Bangladesh, however, remains miniscule compared to credit provided to other sectors. For instance, agricultural credit was 12.5% of the total credit in 2002. In 2019, the share of credit to the agriculture sector went down to 5%. It is important for developing countries to provide more capital to the farmers through formal channels with easy regulations. Inaccessible formal credit forces farmers to seek informal credit, which can be costly due to higher interest rates. Besides the formal and informal sources, in recent times NGOs have come into play. Microfinance institutions have been providing credit to small and marginal farmers, who are often left out of formal credit facilities.

Seeds

Much of the increased productivity in agriculture is owed to the development in seeds. High yielding variety (HYV) seeds as well as modern seed varieties (MSV) have resulted in higher yields, specifically in Asia and Latin America. Asian countries developed new rice varieties that saw increased yield and higher resistance to pests. On the other hand, countries in South America exhibited higher yield in maize production due to newly developed seeds (Conway, 2019).

Seeds in Bangladesh are procured through two distinct systems. Farmers save seeds during harvest, which is also known as the informal seed sector in the country. Contrary to the informal sector, there is a formal seed sector where seeds are produced following scientific production methods. In Bangladesh, the informal seed sector still remains dominant. However, the situation has been changing as private entities are trying to get a share in the market because HYV seeds have become popular among farmers. Quality seed actually goes to farmers only through the formal system. Within the formal system state-owned enterprises, private companies, and NGOs are major actors in delivering quality seed. In the informal seed system, farmers produce and preserve seed through their own practices. At the very outset of the Green Revolution, large quantities of HYV seed were imported from the International Rice Research Institute (IRRI), the Philippines, and India. After that, public and private/NGOs made efforts to fulfil the national requirements of quality seed. In the public sector, the Bangladesh Agricultural Development Corporation (BADC) started with a meager quantity of 13.8 tons of quality rice seed. Over 47 years, the market share and contribution of this public organization has been about 30% of the total supply of quality rice seed. The Bangladesh Rice Research Institute (BRRI) has developed 51 HYVs including four hybrids (three for *Boro* and one for *Aman*). BRRI, a variety developer, regularly provides

breeders to all seed processing organizations for multiplication of quality seed for farmers. Along with BADC and BRRI, the Department of Agricultural Extension (DAE) makes efforts to supply quality rice seed to targeted farmers' groups. The share of private/NGOs in the total seed supply was 5% in 2005–2006 and increased to 9% of total national demand and 21% in 2009–2010. The public sector share was 85% and 15% of the total quality rice seed supply by private/NGO groups. The gap between national demand and supply was substantially reduced from 74% in 2006 to 56% in 2010. In amended seed rules in 1998, the government made substantive provisions for the private sector. Since then, multinational corporations have brought hybrid seed to Bangladesh. Hybrid rice seeds covered a very small portion of the *Boro* areas in 1998 but increased coverage to about 20% with the increase in imported seed. In 1998 600 tons of hybrid seed were imported, which increased to about 8,000 tons. Along with the private sector, the public sector has joined in for local production. Local production, which was 0.3 ton, increased to 410 tons in 2010. In fact, farmers adopted hybrid rice mainly due to high yields leading to high profitability and short field duration that could avoid natural hazards like hailstorms and seasonal floods. The use of hybrid seed in agricultural production increased almost 10 times from 1998–1999 to 2007–2008. Imports increased to 7,755 tons in 2007–2008 from 600 tons in 1998–1999, whereas the production of hybrid seeds jumped to 2,271 tons in 2007–2008 from a mere 0.3 ton in 1999–2000 (Hossain, 2009). This has resulted in higher domestic production in seeds, not only in rice varieties, but in maize production as well, leading to an increase in yield, particularly in *Boro* and maize production (Kolady & Awal, 2018).

Introduction of modern seed varieties has enabled higher yield growth across Asia and Latin America. MSV contributed to almost 50% of growth in yields during 1980–2000 in developing countries (Evenson & Gollin, 2003). Modern seeds have had a differential impact as this widened the gap between and within regions. The impact of MSV in sub-Saharan Africa is negligible. The low productivity from MSV can be attributed to lower adoption of seeds in African countries (O'Gorman & Pandey, 2010).

Fertilizers

Intensive use of fertilizers was part of the Green Revolution that shaped the agricultural sector for decades. Synthetic fertilizers like nitrogen-based fertilizers, potash, and phosphates have now become an integral part of the agricultural production process in the country, replacing the traditional natural fertilizers. Countries are now in a race toward achieving self-sufficiency and food security, which has raised the intensity of cropping. Multicropping as well as hybrid modern crop varieties have allowed countries to significantly increase yields. This has also elevated the usage of chemical fertilizers in production. Global consumption has shot up, much of it in Southeast and South Asia.

TABLE 3.9 Change in Cropped Area and Cropping Intensity (in 000' ha) (1972–2013)

YEAR	SINGLE-CROPPED AREA	DOUBLE-CROPPED AREA	TRIPLE-CROPPED AREA	NET CROPPED AREA	INTENSITY OF CROPPING (%)
1972–1980	4,895.5	2,943.4	551.8	8,502.0	148.2
1981–1990	4,321.4	3,466.5	762.0	8,550.1	158.4
1991–2000	3,023.1	3,908.0	994.6	7,925.9	174.5
2001–2010	2,823.5	4,032.4	1,080.3	7,936.1	178.1
2011–2019	2,288.2	3,913.6	1,759.0	7,977.0	193.7

Source: Various agricultural yearbooks, BBS.

However, over-usage of fertilizers not only raises the cost of production but also is detrimental to the environment. Overuse may also deplete natural nutrients in the soil. In Bangladesh, fertilizer use has risen sharply compared to other Asian countries. In 1981, almost all the countries had a similar level of fertilizer use. As demand for food increased in most Asian countries, farmers adopted intensive production methods. This largely contributed to the higher fertilizer use per piece of agricultural land. At the same time, many of these countries adopted multiple cropping schedules that automatically meant using more fertilizers. Bangladesh, for instance, has three major cropping seasons.

The triple cropping has been increasing with modern seed varieties. Triple-cropped areas increased by 362% in 50 years, whereas double-cropped areas augmented by 48% (Table 3.9). Multicropping with a two-month gap between harvests would increase the additional crop area by 50 million hectares (Waha et al., 2020).

The use of fertilizer is also dependent on the farm size (Figure 3.3). A smaller farm size contributes to higher fertilizer input. Small farmholdings dominate the agricultural sector in countries like Bangladesh, India, and China. Hence, the usage of fertilizer per hectare is higher. For instance, an increase in farm size by 1% saw a decline in fertilizer use by 0.3% per hectare in China (Wu et al., 2018). As a result, increasing the farm size may significantly reduce the dependence on fertilizers and ensure sustainable farming (Ju et al., 2016).

The price of fertilizers is another factor that may explain the high usage of it. Fertilizers are heavily subsidized in Asian countries to lower the burden on farmers and promote intensive farming to supply increased food demand. India, for instance, allocates a subsidy worth 0.5% of its GDP on fertilizers (Gulati & Banerjee, 2015). The Bangladesh government allocated USD \$700 million for a subsidy on fertilizer in 2018–2019 (World Bank, 2020). One reason for subsidizing the fertilizers is the

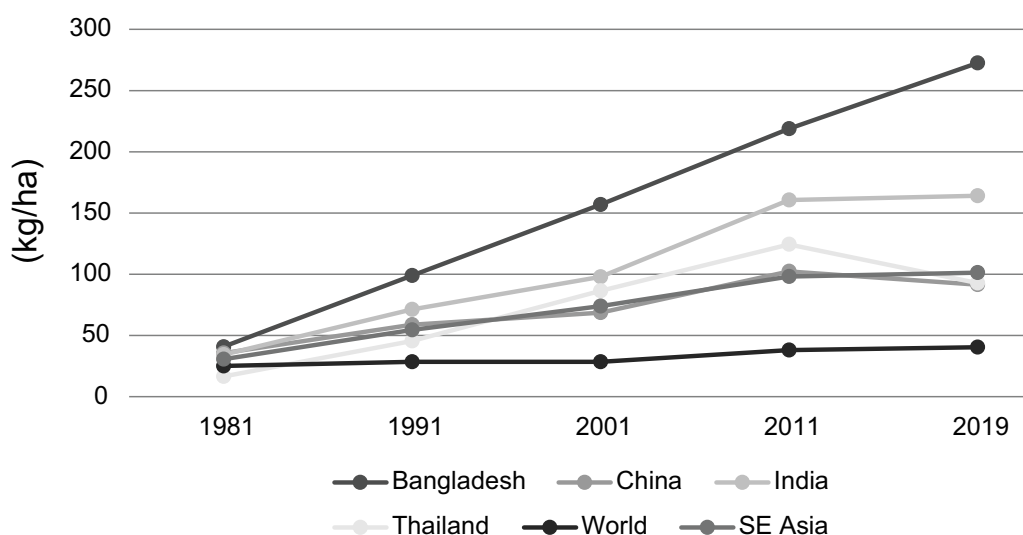


Figure 3.3 Fertilizer use per agricultural land (kg/ha). (Source: FAO, 2021.)

dependence on imports rather than production. Fertilizer consumption in Bangladesh is 477% of the total production, meaning the country consumes almost five times the amount produced here (Titumir, 2021). Such high dependence on imports means the country has little control over the price of fertilizers. When there is a rise in price globally, government has to allocate more in subsidies to keep the local market stable. Small farmholdings in these countries rely on such subsidies for higher productivity. Small farms in Bangladesh have shown a significant positive impact on the fertilizer subsidy (Nasrin et al., 2018). A decrease in the subsidy may raise the price of fertilizer, which in turn would significantly shrink productivity. Even though small farmers are risk averse and do not react sharply in times of price change, an increase of 50% in the price of fertilizer may still cause a reduction in use of fertilizer, which may eventually lead to a loss of 107 kg in yield per hectare (Rahman et al., 2013).

In Bangladesh, use of fertilizer has seen an upsurge due to the degradation of soil nutrients from multicropping. In one village, farmers estimated that the use of fertilizers per unit of land doubled in 10 years. Synthetic fertilizers have replaced traditional natural fertilizers like cow dung. Intensive farming, use of synthetic fertilizers, and chemical pesticides have caused a depletion of nutrients in the cropland, which has further raised the demand for fertilizer to maintain the same level of production. The most common multicropping pattern in Bangladesh is *Boro-Aus-Aman* rice varieties in three seasons. The rate of depletion of nutrients in the soil for *Boro-T.*, *Aus-T.*, and *Aman* varieties during 1971–2006 was 333 kg per hectare per year, which was the highest among different cropping pattern (Table 3.10). A double-cropping pattern instead of the triple-cropping pattern would reduce the depletion to almost half. However, it would also significantly reduce harvests and yields, causing much damage to food security in the country.

TABLE 3.10 Estimation of Nutrient Depletion under Different Cropping Patterns

MAJOR CROPPING PATTERN	TOTAL YIELD (TON/HA/YR)	CHEMICAL INPUTS (KG/HA) ^a			OUTPUT (KG/HA) ^b			BALANCE (KG/HA)			APPROXIMATE TOTAL DEPLETION (KG/HA/YR)
		N	P	K	N	P	K	N	P	K	
<i>Boro-Fallow-T.Aman</i>	8.0	248	49	118	324	32	234	-76	+17	116	175
<i>Boro-T.Aus-T.Aman</i>	11.5	350	60	151	469	57	368	-119	+3	217	333
<i>Boro-GM-T.Aman</i>	8.0	285	—	135	324	32	240	-39	+28	105	121
<i>Mustard-Boro-T.Aman</i>	9.5	378	73	183	404	95	326	-26	-22	143	191
<i>Potato-T.Aus-T.Aman</i>	38.0	386	67	220	430	53	435	-44	+14	215	245
<i>Wheat-T.Aus-T.Aman</i>	10.0	335	65	166	420	64	292	-85	+1	126	210
<i>Wheat-M. bean-T.Aman</i>	8.0	275	64	190	305	52	284	-30	+12	-94	112

Source: Bangladesh Agricultural Research Council (BARC), 2012.

Note: N stands for nitrogen, which is responsible for strong stems and growth of foliage. P represents phosphorus, which aids healthy growth of roots, flowers, and production of seed. K denotes potassium, which improves overall health and resistance to diseases.

^a Fertilizer, manure, fixation, deposition (rain), sedimentation (flood), and irrigation.

^b Harvested product, residues removed, leaching, denitrification, volatilization, and erosion.

The rate of application of fertilizer increased from 0.36 kg per hectare in 1975–1976 to more than 298 kg per hectare in 2007 (Titumir & Basak, 2010). Application of nitrogen, phosphate, and potash fertilizers increased from 42 kg in 1981 to 286 kg in 2019. The increased use of fertilizer is one possible factor in increased productivity in Bangladesh. Before 1975–1986, maximum farmers cultivated traditional varieties and used organic manures such as cow dung, bone meal, and so on. Since then, the irrigated area of rice and other crops is increasing year after year. In irrigated practices, HYV rice requires a higher fertilizer dose than local low yielding varieties. The HYV acreage and irrigation have a significant positive influence on fertilizer consumption.

Cropping intensity has increased dramatically. In 1980, the cropping intensity was 153.74%, whereas in 2004–2005, it was 176.91%. The Department of Agriculture Extension (DAE) claims that the current cropping intensity is 195%. Therefore, cropping intensity increased more than 23% from 1980–1981 to 2004–2005. Farmers try to produce more crops on their limited agricultural land and use a large quantity of chemical fertilizers to increase production. Therefore, chemical fertilizer demand increases with the increase of cropping intensity in Bangladesh. While soil contributed more toward rice yields during 1985–1990, the contribution of fertilizers increased steadily from 36% percent in 1985–1990 to 40% percent in 2002–2007 (Shah et al., 2008). As soil nutrients deteriorate, the contribution of fertilizers goes up.

The use of fertilizers in farming has also caused a spatial inequality within countries. Access to fertilizers is not equal in all places as seen from the field survey. Inaccessibility may arise from the price and supply of fertilizer in some places. In one village, small farmers were reluctant to use multicropping and hybrid seeds due to the higher requirement for fertilizer. Again, the requirements for fertilizers vary from crop to crop. Hybrid crops require higher amounts of fertilizer, which often fends off small farmers who cannot afford such an amount. As a result, large farmers in the area are more involved in multicropping than small farmers, widening the inequality within the village.

Fertilizer distribution is also entangled in power relations in rural areas of Bangladesh. Fertilizer in Bangladesh is distributed through dealers, and farmers are sometimes selected and allocated a fixed amount based on the type of crop and the size of the land. The whole process is supervised by officials from the Agriculture Department. Farmers with smallholdings argued that the fertilizer distribution mechanism in place leaves room for corruption. Often farmers are left out and are required to pay additional money to the dealers. The location of dealers may also contribute to the inaccessibility of fertilizers and adds extra cost for the farmers.

Pesticides such as dymacron, diozinon, labacida, and furadan are extensively used. Pesticides are composed of various ingredients, which are not always formulated in compliance with strict scientific standards. As a result of the injudicious use of pesticides, both ground and surface water are likely to be contaminated and are adversely

TABLE 3.11 Use of Pesticides per Cropland (kg/ha)

	1991	2001	2011	2019
BANGLADESH	0.13	0.38	1.74	1.73
CHINA	5.82	9.76	13.20	13.07
INDIA	0.42	0.26	0.33	0.36
THAILAND	0.91	1.61	4.30	1.32

Source: FAO (2021).

prone to affect the fertility of soil. Use of these pesticides also depletes fishery resources. The rapidly accelerated use of pesticides is having detrimental effects on the environment and the health of farmworkers and consumers alike. During the three decades of 1990 to 2020, application of pesticides increased by about 13.5 times, from 0.12 kg/hectare in 1990 to 1.63 kg/ha in 2019 (FAO, 2021).

Pesticide consumption in South Asia and Southeast Asia has remained constant compared to use in China where the consumption has more than doubled. When cropland is taken into account, the level of use of pesticides in China gives a different picture. In Bangladesh, India, and Thailand, use of pesticides per agricultural land and use of pesticides per cropland show similar trends. However, China uses far more pesticides on croplands than on agricultural lands. Bringing more hybrid varieties of crops into agricultural production has led to an increase in uses of pesticides over time (Rahman & Hossain, 2003). Bangladesh has seen a steady rise in pesticide use, almost 10 times that in 1991 (Table 3.11).

Overuse of chemical pesticides runs the risk of contaminating foods. Education of farmers plays an important role in ensuring the optimum use of pesticides. To curb overuse, pest-resistant varieties of crops may be planted, which is detrimental to the environment as well as food safety (Carvalho, 2006; Rahman & Hossain, 2003)

Irrigation and Mechanization

The Green Revolution and the subsequent change toward using hybrid seed required a high level of irrigation. Multicropping also meant farming during the dry season, and that required advanced irrigation methods. As a result, deep tube wells became increasingly popular among both small and large farmholdings in all countries. With increased demand for food, less arable lands were prepared for farming with the help of irrigation and fertilizers. This also increased the total area of agricultural land in many countries that offset the loss of area from urbanization.

Lack of mechanization in irrigation limits the ability to grow crops year round, as evident from the field study. Places in a geographically disadvantaged position like

Char Lakshmi cannot grow the *Boro* crop, which is usually produced in the dry season. Hence, farmers in such places keep lands fallow and face economic losses. However, large farmers own irrigation and machines that ensure a regular flow of water even during the dry season.

Surface water irrigation has declined considerably due to the absence of new surface irrigation projects and the ineffectiveness of earlier ones (Rahman & Parvin, 2009). During the Rabi season in 2017–2018, more than 73% of the total irrigated area was serviced by groundwater, of which 73.06% was extracted by shallow tube wells (STWs) and 26.28% by deep tube wells (DTWs) (MoA, 2019). In contrast, only 17.67% of the total irrigated area was serviced by groundwater in 1979–1980. The rapid expansion of groundwater irrigation by STWs was due to the government's withdrawal of restrictions on the import of tube wells by the private sector.

Effects of land fragmentation on irrigation are significant. For each plot, canals are necessary to drain water. Constructions of canals for individual plots reduces cultivable land, hampers efficient management, and raises the cost of production. Besides, *ails* around the plots also absorb an amount of irrigation water, which also reduces irrigation efficiency. Of the interviewed farmers, 68% percent said that land fragmentation restricted their irrigation efficiency and 70% answered that water was lost because of the small sizes of plots. They also, however, raised questions about irrigation practices for large-sized plots. Irrigation is difficult if the plot size is more than 40 *kathas* and if the land is not properly leveled.

SUMMARY

Defying popular claims, the field survey shows that land fragmentation is driven by demographic reasons rather than purchase of lands by those who already have lands. Increased land fragmentation has raised the cost of production and led to loss of lands. The chapter also discussed important factors of production.

Fertilizer and pesticides have become an integral part of agricultural production, while also adding another barrier for small farmers. Modern and hybrid seeds have allowed farmers to adopt multicropping. Irrigation is another necessary element in production that augments modern seed varieties. Again, the findings show that smallholding farmers face higher costs and therefore produce at a suboptimal level, with a ceiling on their level of productivity, contradicting the mainstream theories.

About the relationship between large landholding and productivity, evidence from the villages like Bara Pakhia in Tangail exhibits that larger farmer tend to lease out or sharecrop their land and funnel investments into business or migration rather than re-investing in the land. Income opportunities outside agriculture make them less willing

to invest in land, which has a negative effect on productivity. Moreover, smallholders make intensive use of labor.

The findings here also indicate that land transfer is not directed by productivity differences as the neoclassical argument assumes. In Bangladesh, the majority of land purchases are financed by nonagricultural income such as business ventures or remittances. Especially where incomes have been diversified outside agriculture, farmers treat investments in land as a store of future value rather than as a way to generate income directly through enhanced productivity. Land is not being transacted for productivity-enhancing cultivation but for potential future investments outside agriculture. For example, in Tangail, farmers explicitly stated that their primary reason for purchasing land, using remittances as the main source of funding, is not to increase productivity, and they are not interested in transforming land from savings to productive investment. Indeed, the use of nonagricultural earnings to purchase more land points out the importance of looking beyond the assumed relationship between land ownership and land acquisition. In many families, nonagricultural variables such as earnings from business or remittances were absolutely crucial to their ability to purchase more land.

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LAND TRANSACTIONS AND AGRARIAN ACCUMULATION

INTRODUCTION

In the delta region around the village of Char Lakshmi in the Noakhali district, competition for land between elites is pushing small cultivators off their land. Without land to survive on, people in this area are gradually relying on their own labor, and the aquaculture projects started on these large tracts of grabbed land are one of the only viable sources of income, albeit a very poorly paid and exploited one. This process is akin to the differentiation model typified in many transitions from feudalism to capitalism in Western Europe wherein the peasantry was pushed off their land to join the workforce in the then emerging capitalist sector. Ideally, land previously owned by many is concentrated in the hands of a powerful few, who then seek increased productivity of the land for further capital accumulation, using the now landless as their laborers. This scenario is more akin to a feudal system of landlords and agricultural laborers, and not so much the kind of proletarianization of the peasantry through industrial activities in urban areas.

This chapter delineates the differences between market-based and nonmarket-based land transactions and demonstrates that nonmarket transfer of assets in the form of primitive accumulation dominates the transfer of land in developing countries. In addition, it aims to show that a stalemate in the allocation of land and a failure to achieve land consolidation in the hands of the more productive classes explain the truncated agrarian accumulation. In doing so, it attempts to find out the motivation behind purchases of land and whether purchases are treated as an instrument of savings, a form of store of value, not necessarily collateralizing those into a productivity-enhancing process of accumulation.

The distinctions between primitive and market-based accumulation in developing countries are also discussed with reference to the wider debate, in addition to the

examination of the local or contextual process of accumulation. As such, the chapter deals with the impacts of the various forms of accumulation and their bearing on productivity. A key focus is to establish a relationship between land relations and productivity as they relate to power and primitive accumulation, which has not been fully examined in other studies. This form of primitive accumulation also blurs the distinction between market and nonmarket accumulations. Such a departure from previous studies necessitates a discussion on accumulation revolving around a treatment of the various forms of power, both organizational and economic, that are active in developing countries. Power also feeds into institutional and technological variables, which are pivotal to any understanding of the agrarian transition.

PROPERTY RIGHTS INSTABILITY, PRIMITIVE ACCUMULATION, AND CAPITALIST TRANSITION

Property-related conflicts are hugely common and on the rise in developing countries. The legal system is overburdened with land-related disputes, and a lion's share of cases in the courts are related to property rights. In Bangladesh, for instance, till June 2019, the number of cases pending in the Land Survey Tribunal stood at 303,035 (The Independent, 2019). These cases are often the results of contestations of power, practiced through a nexus of political factions and their allies in the administrative, law-enforcing, and judicial systems. The nonmarket transfers of assets, which is referred to as primitive accumulation, involves a process by which the politically, socially, and economically powerful secure benefits using their power to change property right allocations, as opposed to market-based accumulation where the transaction of land and other assets occurs through formal and institutionalized contractual structures. Primitive accumulation is the nonmarket reallocation of land and assets and is common in economies going through a capitalist transition. Primitive accumulation is also defined as the process of using political power in different forms to capture economic resources, including land.

Marx also states that "primitive accumulation" is the "historical process of divorcing the producer from the means of production," transforming "the social means of subsistence and of production into capital" and "the immediate producers into wage labourers" (Marx, 1967). The means of this divorce are varied and include the "forcible usurpation" of common property through "individual acts of violence" and eventually the "parliamentary form of robbery," the Acts for Enclosures of the Commons, through which "the landlords grant themselves the people's land as private property" (Marx, 1967). As Marx showed, peasant production could be exploited without transforming

it. Marx suggests an inverse relationship between the development of productive and unproductive capital. The predominance of unproductive capital can become a barrier to the historical emergence of capitalism. Certain forms of capital in Bangladesh are “unproductive”; they preserve rather than reform preexisting relations of production.

Harvey (2003) looks at primitive accumulation as “accumulation by dispossession,” where he emphasizes privatization, calling it “the cutting edge of accumulation by dispossession.” The different forms of privatization and the forceful or legally backed private appropriation of public property, however, also give rise to new forms of “proletarianization” (Harvey, 2003). Wood (2002) gives a different perspective, following Brenner, and argues that market dependence can apply not just to capitalists and propertyless laborers, but also, under certain conditions, to agricultural producers in direct possession of land. Pointing out that Brenner’s “most important historical insight” is his demonstration that “this kind of market dependence could exist well short of complete dispossession,” Wood (2002) argues that for Marx, “the real ‘primitive accumulation’” involved “the expropriation of the agricultural producer.” Today, the changes in land use take the form of shifts in food production for consumption to domestic exchange, export, or biofuel production, while forest lands and “idle lands” have been converted to food and biofuel production (Borras Jr. & Franco, 2012).

The logic of a neoclassical perspective is that land will naturally be transferred to the users who are the most productive upon it. While this perspective admits that market conditions must be optimal, free of state or other constraints that might impede its ability to distribute wealth fairly, it assumes that land relations reflect a merit-based system wherein success follows from personal initiative and industriousness. Yet Khan (2002) shows that so called “market-based accumulation” can take place in a very “primitive” fashion. This happens when the political settlement and institutional structures modify the operations of the state and market to accelerate the accumulation of resources by particular classes or groups.

Whether accumulation of the means of production—in this case land—takes “primitive” or “market-based” forms, it does not necessarily occur according to the requirements of a capitalist transition. The fluctuating nature of elite power and the shifts in the rural class structure, for example, under the influence of increased migration and business activity, can lead to a truncated transition. In order to perceive the transition within its narrowly confined framework, neoclassical theories ignore the forceful impact of class relations and the various forms of power that are embedded and exercised in relation to the allocation of land that can affect the achievement of consequential productivity. In contrast to neopopulists, the real constraint to productivity-enhancing changes comes from the distribution of power between factions engaged in primitive accumulation. This results in an effective stalemate in the distribution of land and a failure to achieve land consolidation in the hands of more productive classes.

The agrarian structure in developing countries is distinct from classical capitalism where labor is free and a capitalist class owns the land and the resources for investment. The “capitalism” observed in Bangladesh has not yet eliminated the smallholder, as was shown in the previous chapters, because of the demographic explosion. Smallholdings are actually more dominant than in the past, though landlessness has been increasing at the same time, resulting in what can be termed “pauperization” as opposed to “polarization.” The capitalist penetration is producing differentiation to a higher degree in some areas than in others. A common Marxist expectation is that the greater the extent of commodity production, the greater the struggle over land, and more intense forces of primitive and market accumulation are likely to squeeze smallholders off the land. The distinction, however, between the different types of accumulation is blurry at best.

It is important to identify the kind of differentiation that is productive and conducive to capitalist development. The forms of differentiation taking place in Bangladesh are productive in many ways, and yet often not productive directly with relation to agricultural development. Where class structures may be shifting, for example, in the village of Bara Pakhia in the Tangail region, differentiation is leading to a shift in land relations, but a corresponding increased productivity is not in evidence. Land is also being used as a store of wealth—a store whose value is ever increasing as the struggle for this scarce resource becomes more acute since the population continues to expand. Many landowners may be waiting for the opportunity to cash in on this reserve of wealth, usually to further other economic strategies or investments, but also to garner political strength or to comply more tightly with social or cultural values and norms. This may take the form, for example, of using land to generate more power in a community politically, or in passing land on in the male line of the family.

While accumulation, both “primitive” and “normal,” occurs in a host of ways in rural Bangladesh, and in many ways pivots around the ownership of land, the land is being invested in less as a productive asset with the potential capacity to produce an agricultural output that can be reaped by the owner, and more as a source of subsistence in a context of high prices, or as a store of value that can be cashed in if and when needed. Many observers may be tempted to deduce from this that there is no capitalist impulse in the peasantry, or that it is highly latent. On the contrary, the rural peasantry is tightly tied to the market, which is, in part, due to the current phase of global capitalism’s thrust to reach into every nook and corner and the associated changes brought about by the economic policies of the state. But this has resulted in the use of land as an asset that can be used to facilitate other investments, thus spreading portfolio risk, which is also a tenet of capitalism.

This strategy is rational, given the inefficient and distorted input market, rampant excesses of middlemen and intermediaries, dispersed connectivity, poor communication networks, and other high transaction costs, resulting in low or negative profitability.

These factors operate as barriers for investment in agricultural productivity-enhancing activities in a scenario where other opportunities such as nonagricultural business and migration exist. Furthermore, the factional nature of political power and associated rent-seeking activities also do not necessarily ensure secured property rights. For example, peasants in Bogra were in search of jobs because it was impossible to make a living solely from agriculture.

Lenin's argument is also in operation as peasant households, no matter how small their holdings, contribute to capitalist development via their labor and consumption since peasant farmers are increasingly reliant on the market for inputs. During field investigations many of the farmers vented their complaints about market structures and were often bitterly upset about the imperfections in the input market, which slowed down their productivity and threatened their livelihood and food security. Although these inputs are crucial to farmers to increase overall productivity, their position with respect to these markets is often the source of their greatest insecurity. The role of the state in relation to the input market and the effect of state involvement on the survival of smallholders will be taken up in the next chapter. The tying of smallholders to this state-driven and intermediary-manipulated market leads to increased inequality, dispossession, and low productivity.

Although labor is largely untied from land and thus "free" in Bangladesh, this alone does not drive a trend toward capitalist agriculture as observed in Western Europe during the transitions of those economies. This is because the additional institutional and political conditions required for achieving higher productivity growth are absent. The input and output market structures are inadequate for spurring compulsions for increased productivity due to the nature of the elite, tied to the state at local and national levels for leveraging patronage as well as smallholders who hold fast to their land for security. These are configured by social property relations that allow and maintain forms of peasant production that are suboptimal. These trends in land tenure, production processes, and forms of accumulation result in a slow capitalist agrarian transition.

The structure of political power has constrained both market and nonmarket land transactions, preventing a significant productivity transformation. Political power has influenced both the market and nonmarket land transactions. The clientelist nature of the power constrains market transactions through political settlement. In nonmarket transactions the nature of exercising power over others has constrained the transactions.

In an economy productivity of land depends on three factors: capital, technology, and labor. If these three factors are assured for cultivation, then productivity is ensured. A farmer can possess a piece of land in a market depending on the price of the land and the demand for the land. But in a real-life scenario price and demand do not determine the possession of the land. First of all, the possession of land includes three

things: possession, record, and deed of registration. The three factors of buying a land are dependent on two factors—power and money.

Suppose power P , money M , possession of land D_1 , record of land D_2 , and deed of registration D_3 . Here,

$$D_1 = f(M,P)$$

$$D_2 = f(M,P)$$

$$D_3 = f(M,P)$$

Thus, money and power both determine buying any land in the following forms:

$$\frac{dD_1}{dt} = \alpha_1 M \times \alpha_2 P \dots\dots\dots (4.1)$$

$$\frac{dD_2}{dt} = \alpha_1 M \times \alpha_2 P \dots\dots\dots (4.2)$$

$$\frac{dD_3}{dt} = \alpha_1 M \times \alpha_2 P \dots\dots\dots (4.3)$$

where $\alpha_1 = \text{money}$ and $\alpha_2 = \text{power}$.

Equations (4.1), (4.2), and (4.3) posit that an absence of any of the above coefficients will not allow having possession of a piece of land. Again, suppose that the farmer inherited some land. For growing crops, the farmer needs at least three factors: capital, labor, and technology.

If $L = \text{land}$, $C = \text{capital}$, and $T = \text{technology}$, $L = f(M)$, $C = f(M)$, $T = f(M)$.

PROPERTY RIGHTS, LAND ADMINISTRATION, AND TENURE SECURITY

Property rights over land and other natural resources are commonly classified into four categories of property regimes: open access (no rights defined), public (held by the state), common (held by a community or group of users), and private (held by individuals or “legal individuals” such as companies) (Hanna et al., 1995). Such a classification, however, is a rough guide to define entitlements that a rights holder should have in one of the stylized property regimes. In reality, particularly in developing countries, these regimes are found in combinations, and the terms “common property” and “open access” are often used interchangeably (Schlager & Ostrom, 1992). But open access and

common property are distinctly different in the case of user rights; in common property nonmembers of the community are excluded from using the common areas while in open access nobody has the legal or statutory right to restrict access (Benda-Beckmann & Benda-Beckmann, 1999; Hanna et al., 1995). As stated earlier, the term “common property” has been found in the literature in various forms: (1) property owned by government, (2) property owned by no one, and (3) property owned and defended by a community of resource users. The term is also used to refer to any common-pool resource used by multiple individuals regardless of the types of property rights involved.

Schlager and Ostrom (1992) proposed a bundle of rights and accordingly categorized the rights holders into authorized user, claimant, proprietor, and owner depending on different property rights arrangements. According to them, access right means resource users may have the authority to enter a resource guided by some rules. For instance, the resource users may be required to reside in a specified jurisdiction and to purchase a license before entering a resource area. Having access and withdrawal rights, however, does not guarantee users more extensive rights of authorizing participation in collective-choice actions. Collective actions are undertaken within a set of collective-choice rules that specify who may participate in changing operational rules and the level of agreement required for their change. The operational-level rights and collective-choice rights differ between exercising a right and participating in the definition of future rights to be exercised. Management is the entry point of all collective-choice property rights; the holders of this right have the authority to determine how, when, and where harvesting from a resource may occur, and whether and how the structure of a resource may be changed. The right of exclusion is more advanced than the management right; holders of this right have the freedom to set qualifications for other individuals, which they have to meet in order to access a particular resource. The right of alienation is the combination of all other types of right; the holder of this right enjoys all previous rights along with having the right to sell or lease the property (Schlager & Ostrom, 1992).

In Bangladesh, all forms of rights described by Schlager and Ostrom (1992) are not recorded since land is owned either by private individuals or by the state. In private ownership three different tenure types have been identified so far: (1) common law freehold (exclusive ownership of land for an indefinite period, estimated to apply to 69% of agricultural farm landholding in 2005); (2) 99-year use rights to government land (*kbhas*) that is distributed to landless families; and (3) leaseholds (the right to use land owned by another for a fixed period). Leases for agricultural land include both cash leases and sharecropping arrangements (Shafi & Payne, 2007). Cash leasing agreements range from 1 to 99 years. In a sharecropping arrangement commonly the sharecropper and the landowner each receives one-third of the crop; the remaining third is allocated based on each party's share of the costs; but the arrangement may vary from

region to region. According to the 1984 Land Reform Ordinance, the sharecropper has a right of first refusal to purchase the sharecropped land at market price (Shafi & Payne, 2007; Uddin & Haque, 2009).

Except for private property, the remaining types of property may be owned by government bodies, public agencies, or government-owned corporations, or may be managed by the community. In Bangladesh, the Ministry of Lands has authority over *khas* (public) land, which includes surplus land that violates the land ceiling law, and other land owned historically by the state throughout colonial and Pakistani rule. The East Bengal State Acquisition and Tenancy Act of 1951 promoted the goal of retaining the agricultural character of land by giving cultivators first right of purchase and prohibiting other uses, but a large number of exceptions and poor enforcement diluted its impacts. A land ceiling of 33.3 acres was also imposed. In 1961, the land ceiling was raised to 125 acres. In 1972, a land ceiling of 33.3 acres was reestablished and various presidential orders were promulgated for the distribution of *khas* land among the landless. A land ceiling of 20 acres was suggested by the Land Reform Commission in 1982 (Barkat et al., 2001). Local government was charged with transferring the surplus land to the landless. The Land Reforms Ordinance of 1984 placed a 21-acre ceiling on the acquisition or holding of agricultural land and invalidated *benami* transactions, in which a person purchases land in the name of another to evade the land ceiling. Neither land ceiling law has been widely implemented (ANGOC, 2001; Uddin & Haque, 2009). The country also has a percentage of land owned by religious trusts, *waqf* (Muslim) and *debottor* (Hindu) land, which is held by the state and administered by the Ministry of Religious Affairs (DOW, 2008; Shafi & Payne, 2007).

Land administration is highly centralized in Bangladesh and managed under the Ministry of Land, but registration and land disputes, which are quite common, are settled by the judiciary based on codified formal law, which is a continuation of the British colonial legacy.

Individuals' ownership rights to land can be acquired through purchase, inheritance, gift, or settlement by the government (Figure 4.1). The antiquated Transfer of Property Act of 1882 and the Registration Act of 1908 set out the procedures for titling and registration of land ownership, which are complex, lengthy, expensive, and highly corrupt. A summary containing historic developments in land management is given in Figure 4.2. The registration fee is from 8% to 10% of the total value of the land (depending on the area, rural or urban) and other miscellaneous charges to 2% of the sale price. The procedure of property transfer is also complex.

At least 60% of rural families are land-poor and many of them are landless. These people work as seasonal laborers or sharecroppers on land belonging to others. The poor people's access to land in rural areas is, therefore, dominated by term leases and sharecropping, estimated to cover 39% of rural families (Shafi & Payne, 2007; Uddin & Haque, 2009). In recent times, however, sharecropping has declined while fixed-rent

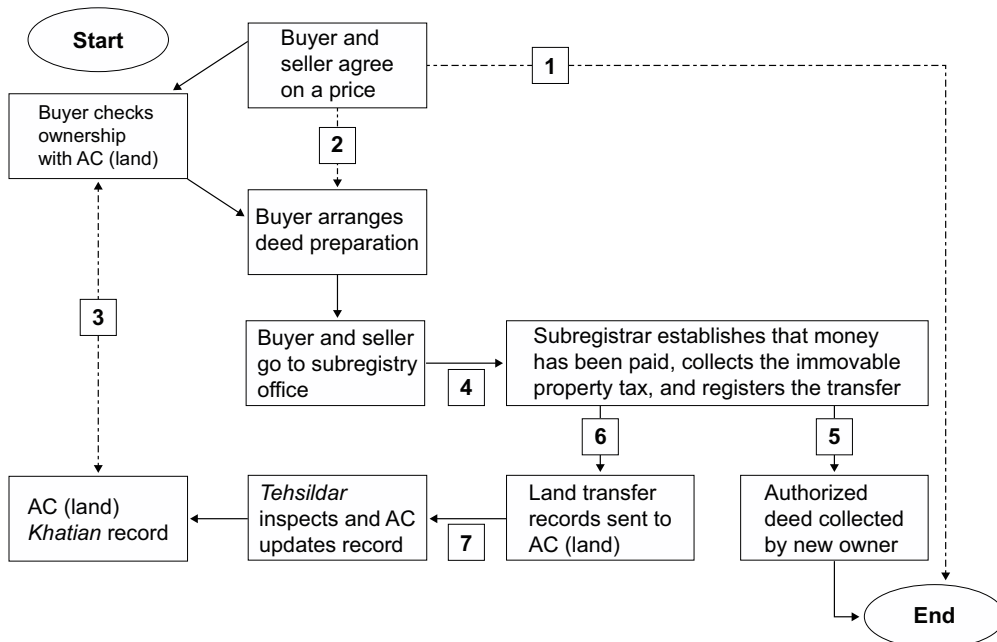


Figure 4.1 Land transfer process. (Source: CARE Rural Livelihoods Programme [2003].)

tenancy and medium-term leasing arrangements have increased (Hilhorst & Porchet, 2012). In practice, most land-tenancy agreements are conducted verbally, although the Registration Act of 1908 sets out a process for registered leaseholds. Under the Land Reform Law, adopted in 1984, agricultural households already occupying farmlands obtained rights to their homestead land through an anti-eviction provision (Shafi & Payne, 2007; Uddin & Haque, 2009).

Land qualifies as both a natural and a social resource. In a productive sense it is a natural resource but in terms of ownership, access, and management, it is more of a social resource. Generally, land tenure and property rights exist within a regime of rights. The term “land tenure” categorically falls under the broader concept of natural resource tenure, though the concept of “tenure” is a social construct, defining the relationship of an individual to the group and of different groups to each other and the state and their collective impact on land under certain rules and regulations. Nevertheless, the view and use of land tenure varies with geographical and cultural differences. Societies that were under colonialism have complex tenure arrangements since indigenous and imposed tenure patterns often coexist at the same time in the same area (Payne, 1996).

Tenure security is a concept first institutionalized through the legal structure in European society (UN, 1973). In continuation, the concept of private property was first introduced in Western Europe. The private ownership could be either in perpetuity (freehold) or for a specified period (leasehold) (Payne, 1996). On the contrary, the concept of public ownership has emerged as a reaction to the perceived limitations of private ownership in enabling all sections of society to achieve access to land. In some cases, this took the form of reverting to precolonial concepts of communal ownership, guided

Period	Key development	Administration	Survey	Khas land and land ceiling	Registration and fiscal policy	Land right movement
Precolonial 1757–1947	Hindu rulers introduced first land revenue systems C-16 Sher Shah introduced land and reformed land measurement, revenue assessment and collection system					
Colonial 1757–1947	1793: Permanent Settlement Act establishes Zamindari		1888–1940: Cadastral Survey (CS) of undivided Bengal creates first comprehensive record of land rights; still accepted by contemporary courts	1825: Bengal Regulation 11 1868: Bengal Alluvion Act 1919: Government Estates Manual 1932: Bengal Crown Estates Manual	1882: Transfer of Property Act 1908: Registration Act	1946: Tebhaga Movement by sharecroppers
Pakistan 1947–1971	1950: East Bengal Tenancy and Acquisition Act abolishes Zamindar; land should pass to tiller		1956–1962: State Acquisition Survey using CS as blueprint 1965: Present survey revisional settlement begins	1950: Ceiling of 33.3 acres imposed for first time 1961: Raised to 125 acres by Ayub Khan	1950: Remains largely unchanged	1950s–early 1970s: Leftists pursue land reform agenda
Bangladesh 1971–	1972: Revised State and Tenancy Act 1984: Land Reform Ordinance legally recognizes sharecropper rights	1972: Travel allowances end 1989: Land Appeals Board 1991: New Land Admin Manual	Bangladesh Survey is ongoing 2015–2020: Estimated for completion of Bangladesh Survey on Land Rights	1972: Reestablished as 33.3 acres 1975: President's order LXI 1984: New acquisitions max 21 acres; <i>Benarri</i> transfers 1987: Land Reform Action Programme 1997: New Agriculture Khas Land Management and Settlement Policy introduced	1972: Tax exemption for smaller holders 1976: Land Development Tax (LDT) 1992: Revised LDT 2000: Stamp duty reform	1984 onward: Many NGOs and civil society movements are campaigning for land rights; <i>Khas</i> land distribution; agriculture policy reform; shrimp farming policy

Figure 4.2 Land governance development in Bangladesh. (Source: CARE [2003].)

by customary tenure rules, rather than individual ownership (Payne, 1996). Even modern society, to some extent, recognizes the customary land tenure system and appreciates its effective management. In support of the customary communal tenure system, Fisher (1993) has argued that it shapes the relationship not only between the community and its land, but also between the individual members of the community because in this system, land is regarded as belonging not to the individual but to the whole social group. Thus, customary land is not subject to personal ownership, although use rights are alienable within and between members of the community (Payne, 1996).

Tenure security affects farmers in many ways. First, secured land tenure eliminates the anxiety and uncertainty of expropriation that encourages property rights holders to make long-term investment decisions on the land. Second, the title of land provides them with better access to credit, something that not only helps them make such investments, but also provides and assures alternatives in the event of shocks (Deininger, 2003; Feder & Noronha, 1987; Tenaw et al., 2009). In addition, land tenure plays a vital role in shaping farmers' land-use decisions (Feder & Nishio, 1999; Rasul et al., 2004). Absence of clear property rights and insecure land tenure results in short-term profit-maximizing investment that increases the incidence of rent seeking and accelerates land degradation (Feder & Nishio, 1999). Insecure land tenure or the lack of land ownership also restricts farmers' access to credit that is required for improved land practices (Feder et al., 1988; Rasul et al., 2004).

Land is a prerequisite for social, economic, and political power in Bangladesh. Since land is scarce due to high population density, the process of establishing ownership rights is highly intricate and can even lead to violence. Property insecurity in Bangladesh ranges from threats to the homestead in villages to insecurity in public spaces including rivers, roads, forests, wetlands, *beels*, *haors*, *baors*, lakes, hills, and so on. Despite legislative reforms on several occasions in pre- and postcolonial regimes, tenurial security in Bangladesh remains highly volatile and conflict ridden.

MARKET TRANSACTIONS AND PRODUCTIVITY

An understanding of the dynamics and direction of the process of accumulation warrants a bifurcation of market-based and nonmarket-based transactions and the associated impulse for augmentation (grabbing) for productivity. The data collected from the surveyed villages is charted in this section to unearth the relationship between productivity and market transactions of land, understood in terms of ownership and use of land, of different categories of farmers.

The distribution of landholding, in terms of both ownership and tenure, in the studied villages suggests three significant trends (Table 4.1). First, land is transacted across the land-owning classes, irrespective of size. Second, the landless class has become

TABLE 4.1 Pattern of Distribution of Land Ownership

LAND OWNERSHIP GROUP	% OF HOUSEHOLD	% OF LAND OWNED	% OF CULTIVATED LAND LEASED IN	% OWN LAND— SHARE OF MORTGAGE IN
NOAKHALI				
Own only homestead land or landless (0-.04)	39.70			
0.05–2.49 acres	36.40	67.8	0.5	1.5
2.50–7.49 acres	19.20	37.4	.09	—
7.50 and above	4.70	15.4	—	1.0
COMILLA				
Own only homestead land or landless (0-.04)	45.82			
0.05–2.49 acres	36.88	36.8	29.2	16.8
2.50–7.49 acres	7.62	51.9	9.6	—
7.50 and above	0.14	—	—	—
BOGRA				
Own only homestead land or landless (0-.04)	71.71			
0.05–2.49 acres	23.65	67.6	—	19.3
2.50–7.49 acres	4.14	80.8	11.5	—
7.50 and above	0.15	100.0	—	—
TANGAIL				
Own only homestead land or landless (0-.04)	46.60			
0.05–2.49 acres	31.80	62.6	2.3	5.3
2.50–7.49 acres	19.10	52.6	2.6	6.6
7.50 and above	2.08	87.5	12.5	—

Source: Field survey.

laborers. They either engage in agriculture as laborers or move to other places in search of economic activities, as explained by the increased rural-urban migration. Third, cultivation is concentrated in smallholding agriculture. In none of the villages studied was land sharecropped or rented by the landless. Rather, it is the small and marginal farmers who own small parcels of land as well as engage in lease or mortgage relationships.

In Noakhali, sharecropping is the most common transaction, as large and medium farmers sharecrop out and small/medium farmers sharecrop in. In Comilla, smallholders are more likely to lease or mortgage in land. In both Bogra and Tangail, middle-income farmers are more likely to lease in land than in other villages. In the case of Tangail, there is a link between mortgaging and securing capital to send siblings for migration abroad.

TABLE 4.1 Pattern of Distribution of Land Ownership—*cont'd*

LAND OWNERSHIP GROUP	% OWNED LAND— SHARE- CROPPED	% OF CUL- TIVATED LAND <i>KHAS</i> LAND	% OWNED LAND MORE THAN ONE ACRE
NOAKHALI			
Own only homestead land or landless (0–.04)	—	—	—
0.05–2.49 acres	8.9	11.9	9.4
2.50–7.49 acres	20.6	12.1	29.0
7.50 and above	11.5	11.5	57.7
COMILLA			
Own only homestead land or landless (0–.04)	—	—	—
0.05–2.49 acres	0.8	—	16.4
2.50–7.49 acres	—	—	38.5
7.50 and above	—	—	100.0
BOGRA			
Own only homestead land or landless (0–.04)	—	—	—
0.05–2.49 acres	2.1	9.0	2.1
2.50–7.49 acres	—	3.8	3.8
7.50 and above	—	—	—
TANGAIL			
Own only homestead land or landless (0–.04)	—	—	—
0.05–2.49 acres	14.5	1.5	13.7
2.50–7.49 acres	11.8	1.3	25.0
7.50 and above	—	—	—

Source: Field survey.

This may suggest that sharecropping arrangements and smallholders are more productive in Bangladesh, implying that on the whole they might be beneficial for overall productivity, but this is not the case in an area like the Noakhali region. The soil-climatic conditions of this particular land mass require a certain degree of use of technology including irrigation for enhanced productivity. Only larger and wealthier farmers had access to technology and the infrastructure that could produce greater yields.

It is important to note that sharecropping is not, as it is commonly understood in the wider literature, an arrangement geared toward a landless peasantry. In Bangladesh generally, and particularly in impoverished areas, landless people cannot sharecrop because they cannot afford the cost of agricultural inputs. Small and marginal farmers compete over the opportunity to sharecrop land in such a land-scarce situation, though

large tracts of land are emerging out of the rivers through siltation, and these are subject to primitive accumulation.

Many families have sold land to cover family costs or in times of distress such as to pay for dowries or health care. In Comilla, more productive farmers were likely to acquire more land and in turn use that land in productivity-enhancing ways. Land was transacted out, as in Tangail, to finance sending members of the family abroad, and this was done only if enough land was within their means, while smallholders without enough land to sacrifice a parcel of it took out loans. As in Tangail, land mortgaging was becoming more commonplace as opportunities for migration broadened. Landowners could borrow up to 60% of the total value of their land. Many people who provided these loans, in turn, rented the land out to others, normally smallholders who were more productive on the land.

In Bogra, a national NGO was the primary driver of land accumulation in the village. The usage of this land demonstrates that the interest of this NGO was not to enhance productive cultivation, but to hold the land as a future store of value. In Tangail, migrants purchased land even if they would not be there to cultivate it. Often, young men would purchase land, sometimes in their fathers' names, intended for eventual future use by them and their families upon their return. In the years while the migrants were abroad, other family members looked after the land, either working on it themselves (although family labor supply is understandably short), or leasing it out, or hiring laborers to work on it for them. The motivation to buy land was described by many with reference to savings. It was considered a better form of saving than keeping money in a bank. Land owned in a migrant's absence also served as a sort of placeholder, asserting their presence in the family and community even in their absence.

Last but not least, in Comilla, where land is scarce but fertile, and access to input and output markets is comparatively developed, large farmers, particularly uneducated large farmers, displayed a compulsion to produce for accumulation's sake. Large farmers in Comilla with options for other business, however, often preferred to rent out their land, as in Bogra, which enabled them to focus more on other businesses. In both places, the use of day laborers was more common.

In all villages, land was being used as a store of value. The treatment of land as a saving and a safeguard in case of future problems or needs is universal, regardless of whether it overlapped with the intention to be more productive on the land or not. Only in Comilla did almost all farmers seek enhanced productivity, particularly the smaller farmers. While this compulsion toward productivity was emphasized in this area more than in the others, the fieldwork clearly demonstrates that even the ownership of land was being facilitated and utilized for investments in migration and in other businesses.

The production costs for smallholders were lower due to exploitation of their own labor along with intensive management. The farms that rely mostly on family labor are

more productive for reasons of self-exploitation of labor than large farms operated primarily by hired labor. In the case of *Boro* rice production, large farmers had to invest more than twice as much for hiring labor compared to smallholdings (Table 4.2). The ability to use labor throughout the year favors an organization engaged in the production of crops under plantations, rather than with tenants or outgrowers (Courtenay, 1980; Grigg, 1974). Large farmers had to spend more than Tk. 306 per decimal for *Boro* rice production, whereas the amount is less than Tk. 140 per decimal for smallholders, only because of the lower labor cost associated with the latter.

Moreover, disincentives associated with the supervision of hired labor gave family-operated farms a cost advantage over large farms. In such cases, there were no hiring costs for family members. They also had greater incentives to work than to hire waged labor because they receive a share of profits, and site-specific learning costs are also lower. In addition, large farmers find it difficult to operate with a lot of hired labor under a single manager with simple technology. For larger farms, the same draft-animal and driver combination has to be repeated several times.

The efficiency of land tenancy markets might be low if the incentives to invest in land improvements and input availability are not assured. These problems are particularly severe under sharecropping arrangements with the tenants receiving only a share of the marginal product of the inputs. In the sharecropping system, the landowner also has to contribute a share required for harvesting. Both landowner and cropper, therefore, share the risk of harvesting due to any kind of sudden price change. As a consequence, landowners do not like the sharecropping system. In rural Bangladesh, sharecropping is generally observed for some vegetables crops where the relative profit level is high, but the risk is low. Most of these vegetables (e.g., pointed gourds, eggplants, and so on) cultivated through sharecropping are grown during the winter season. For example, the average input cost of the pointed gourds per decimal is Tk. 644 against an output price of Tk. 1,667, implying profitability four times higher than that of *Boro* rice (Tables 4.2 and 4.3).

Cereal crop production through the sharecropping practice, amounting to almost 90% of the total crop production in Bangladesh, is not economically viable due to high risk and low profitability. Moreover, banks are reluctant to provide credit to sharecroppers as croppers do not own the land. On the other hand, both the cost of production and the price of sale are largely controlled by the landowner even if the margin of profit is very low, and the cropper is kept out of the decision-making process in most of the cases. These factors make croppers dependent on the landowners in a way that is perceived in some respects as being similar to bonded labor.

The profitability of smallholdings, if they are to be called that given the circumstances, comes from savings or unaccounted-for costs of production. Smallholders employ their own labor more than larger farms, which explains their reduced cost of

TABLE 4.2 Farmer-Level Cost for *Boro* Paddy
Production per *Bigha* (33 decimals)

	ITEM OF COST	PRODUCTION	
		COST FOR SMF	PRODUCTION COST FOR LF
SEEDLING COST	Seed (collection and preparation for germination)	90	140
	Preparation of seed bed	50	200
	Fertilizer	130	180
	Irrigation	70	110
	Uprooting from seed bed	—	280
	Total cost at seedling period	340	910
TRANSPLANTING TO HARVESTING COST	Land preparation (power tiller/country plow)	600	600
	Transplanted seedling	—	400
	Fertilizer	1,210	1,510
	Urea 30 kg (Tk. 360)		
	TSP 10 kg (Tk. 230)		
	DAP 10 kg (Tk. 270)		
	Other (ZnSO ₄ , cow dung, etc.) (Tk. 350)		
	Labor (Total two days; Tk. 300)		
	Irrigation cost	2,200	2,500
	STW (Tk. 2500)		
	DTW (Tk. 1200)		
	Labor (Total two days; Tk. 300)		
Weeding	300	1,100	
Labor two times (Tk. 1200)			
Herbicide + labor (Tk. 900)			
Harvesting	—	880	
Total cost	4,310	6,990	
THRESHING COST	Threshing		
	Carrying (0.5 to 1 km)		970
	Threshing and packing		1,240
	Total cost at threshing		2,210
TOTAL COST DURING SEEDLING TO THRESHING PERIOD		4,650	10,110

Source: Field survey.

SMF = smallholding farmers; LF = large farmers.

TABLE 4.3 Farmer-Level Cost for Pointed Gourds per *Bigha* (33 decimals)

ITEM OF COST	PRODUCTION COST FOR SMF
Land preparation	1,200
Transplanting cost of seedling	500
Weeding	500
Fertilizer	5,990
MOP 10 kg	
DAP 20 kg	
Mustard cake 30 kg	
Vitamins and medicine	
Organic fertilizer	
Labor (10 days)	
Raised platform	7,960
String (6 kg)	
Bamboo (40 pieces)	
Labor (12 days)	
Weeding (two times)	2,000
Vitamins and medicine	600
Harvesting and purchasing cost	1,500
Miscellaneous	1,000
Total cost	21,250

Source: Field survey.

production due to intensive use of labor. Nevertheless, smallholders' income tends to be lower, given the lack of economies of scale. There is hardly any retained income (savings); rather, they are perennially plagued by indebtedness, as demonstrated by the ever-growing number and disbursements of micro-finance institutions (MFIs). As of June 2018, the number of MFIs in Bangladesh stood at 805 with the number of clients around 31.22 million, with 1,201.91 billion BDT disbursement in 2018, reflecting a 14.9% growth over the previous year and a recovery of 1,112.21 billion BDT during the same period (Microcredit Regulatory Authority, 2018). They are sustained on a razor's edge, waiting to eventually join as landless, and such an outcome is generally driven by shocks such as natural disasters, or compulsions like dowry payments and the cost of meeting health expenditures in the absence of a social security system to smooth risks. The growing landlessness is also borne out by the national statistics. This process of becoming landless is otherwise known as pauperization.

Smallholders cannot reap the maximum output price as their production is to be sold at predetermined prices to intermediaries due to the interlocking nature of markets,

owing to the lack of capacity to finance the inputs and/or due to indebtedness. If such is not the case, as the field surveys suggest, they sell the produce as they reap the harvest without having any scope of retention or storage due to their cash crunch. This is what has come to be known as distress sales.

In rural Bangladesh, smallholders borrow from local micro credit organizations or sometimes from *mahajans* at a high rate of interest and under strict terms and conditions. They invest that money to purchase inputs like seeds, fertilizers, fuel, and so on during the growing period and to support their family during the lean period. Due to highly restrictive rules, peasants are often bound to sell their products in areas specified by the lender, and sometimes they have to sell during the early harvesting period. They are, therefore, deprived of much of their income from sales of their products. During the field survey, it was estimated that smallholders on average incurred a loss of more than 20% to 30% or sometimes even 50% compared to large farmers due to distress sales. For instance, the best period for high prices for *Boro* paddy in Bangladesh is June–July, whereas they mostly sold during the early harvesting period (April–May). A similar situation is also observed for the other crops (Figure 4.3). Smallholders are, therefore, suboptimally productive, yet their level of profitability is low compared to that of large farmers. Moreover, in a majority of the cases, the respondents record that their meager amount of profit, if any at all is earned, does not provide enough income to go beyond subsistence level. Sometimes they even could not afford to meet basic daily needs.

Moreover, smallholders have significant risks during each growing cycle as the investments they make are highly susceptible to weather uncertainties. Respondents add that the frequency of climatic variabilities including floods and cold waves have “fated” them with a “lose-lose” decision-making and outcome cycle. If the harvest is damaged by bad weather, they get reduced income, they have less money to put toward the next season, and they are forced to buy from the market at a higher price, again reducing money for producing in the next season. The same situation is also observable in other countries.

In addition, smallholders with little or no access to credit due to disfavoring banking rules can attempt to diffuse their risk by relying on accumulated reserves and wealth, social relationships, and risk-sharing arrangements in land, labor, output, and input markets (Bidinger et al., 1991; Deaton, 1991; Jodha 1986; Rosenzweig, 1988; Shaban, 1991). Large farmers can self-insure much more easily than smallholders because of their wealth. They should, therefore, be better able to achieve better profit-maximizing portfolios than smallholders, giving them an advantage in allocative efficiency. In land-scarce environments, the bulk of a farmer’s wealth is in the form of land, so large holdings are correlated with a better ability to diffuse risks through the wealth effect and the robustness of land as collateral for credit.

Month/Crops	January	February	March	April	May	June	July	August	September	October	November	December
	Poush	Magh	Falgun	Chaitro	Boishakh	Joishtho	Asharh	Srabon	Bhadro	Ashvin	Kartik	Ogrohayon
Boro rice–T. Aman	Paddy (Boro rice)											
Expenditure for ag. inputs												
Selling period of SMF					Boro rice						T. Aman	
Maximum profit period	T. Aman					Boro rice						T. Aman
Wheat–Mug dal–T. Aman	Paddy (Short duration–T. Aman)/Jute											
Expenditure for ag. inputs							Paddy Jute					
Selling period of SMF				Wheat		Mug dal				Paddy Jute		
Maximum profit period	Jute				Wheat			Mug dal			Paddy Jute	
Maize–Jute–Maize	Jute											
Expenditure for ag. inputs												Maize
Selling period of SMF					Maize					Jute		
Maximum profit period	Jute						Maize					Jute
Potato–Mug dal–T. Aman	Paddy (Short duration T. Aman)											
Expenditure for ag. inputs												
Selling period of SMF			Potato			Mug dal					T. Aman	
Maximum profit period	T. Aman						Potato and Mug dal					T. Aman

SMF: Smallholding farmers



Figure 4.3 Major cropping pattern in Bangladesh. (Source: Developed from detailed discussions with farmers.)

NONMARKET TRANSACTIONS, POWER RELATIONSHIPS, AND PRIMITIVE ACCUMULATION

Nonmarket transactions have different drivers compared to market-based transactions. The forcible takeover of one party's land by another is a classic characteristic of peasant societies. The early capitalist transition in many countries provides evidence of primitive accumulation where brute force, extrajudicial violence, and discriminatory legislation along with the manipulation of market transactions were used. In South Asia, primitive accumulation of land has been advanced through extra-economic coercion and contractual agreements in interlocked markets. As voluntary transfers were often practically impossible because of peasants' social, cultural, and emotional attachment to land, coercion through the exercise of power was often the last resort (Adnan, 1985; Kautsky, 1976). The outcomes of primitive accumulation can, however, vary with regard to productivity and the nature of the agrarian transition.

The comprehension of landholding is sought through integrating three analytical categories—power, wealth, and social meaning. As mentioned, people seek land for many purposes: not just to produce the material conditions of survival and enrich themselves, but also to gain control over others, and to define personal and social identities. As a matter of fact, landholding does not necessarily correspond to political or organizational power. Nor does land ownership lead to further land acquisition, but a positive relationship between landholding and power is evident. Nonagricultural variables, some of which commonly overlap with power, are more important than prior ownership. In the Bangladeshi context, money power, such as remittances or nonagricultural business income, and political and organizational power both directly and indirectly act as a vehicle in acquiring or grabbing more land.

Power-driven land transactions can sometimes operate through the market, but such decisions and prices are distorted through the exercise of power. For example, faction leaders (patrons) with their allies such as *mastans* or *matbars* can force the government and administration to settle the titles of publicly owned assets in favor of their clientele at favorable prices. The targets of such accumulation are often publicly owned *khas* lands or state-owned reserve areas like forests, rivers, and wetlands.

Another target of power-driven acquisition can be soft segments of society, such as ethnic, tribal, and religious minorities and the underprivileged, including small and poor landholders in urban and rural areas. Land grabbing is one of the major problems faced by the religious minorities and tribal people. Land is taken from the soft segments by force, fraud, or through bribery as it is usually easier to wield power over them. They are left in a state of silence about the injustices done to them, fearing violence and retribution, while others are exasperated by the fact that the law-enforcing agencies in the

locality do little to protect them from wrongful acts such as land grabbing, forced eviction, and even crimes such as rape and murder.

In the case of public properties, the relationship between land grabbing, politics, and the electoral cycle is more acute. The ruling factions appropriate public land through different modes like leasing, grabbing, and forceful eviction, as if they are natural claimants. As a result, public land appropriated in some cases is subject to a change of hands with a change of the party in power. In cases of private property, for example, as is observed during the fieldwork in shrimp *ghers* in the southwest region of the country, they could be grabbers only because they are politically powerful and forcefully grabbed the lands of individual owners and started cultivation. It is also observed that if the grabbers' party fails to retain power, the leader flees, and the occupation automatically goes to the new party leaders. In some cases, to maintain such grabbing, they keep a covert link with the party that could replace and/or change their allegiance to the incumbents. There is also the phenomenon of "always in government party," and arrangements such as "shared ownership of covert and overt type" and "mutually agreed rotational sharing arrangement," in which the person(s) in power enjoy the major share and this rotates with the changing of the guard.

The transaction of land based on power is clearly part of a political process. An encroachment on government lands is not an easy task, essentially requiring strong ties with administration and political parties. The field surveys and the media reports reveal that corrupt officials of the land and registration departments, upon bribery, can provide fake documents and the lower courts award the decree of ownership, again at a price. The elite grabbers who are more influential than the petty grabbers and local encroachers often grab forests, rivers, wetlands, and other natural resources. The large real estate companies, ministers, leaders of business houses, nongovernment organizations, who are aligned with political leaders are at the top of the list of grabbers of natural resources. Elite grabbers do not necessarily comply with party politics but have links with leading politicians and bureaucrats at the state and party levels. This is a symbiotic relationship because the primitive accumulators offer bribes and fund major as well as minor parties in order to gain political power.

The accumulators involved in such nonmarket transactions always look for a lower price of acquisition. Grabbers often target the properties of minorities and those who are politically weak due to the lower costs of wielding the appropriate level of power. The properties of minorities are not captured by ordinary people belonging to a different faith or ethnicity, rather the minorities are a soft target like the poor for primitive accumulators. The grabbing of properties of minorities is, thus, not necessarily driven by communal tensions, but in most cases is motivated by a calculation of the relative cost for acquiring such wealth. The failure of the government to reclaim grabbed land, including public land, testifies to the importance of power backing these "transactions."

The government is required to reclaim grabbed public land in order to distribute it to the landless, but the power structure in Bangladesh does not permit the state to act in this way as the political and administrative nexus prevents these interventions.

The process of encroachment by holders of power is perpetuated through networks encompassing local government, administration, law enforcement agencies, and the judiciary. The politically and socially powerful elites maintain a well-functioning distribution mechanism of the rewards of grabbing so that many people within these power networks benefit from these processes. This makes it difficult to block these processes in their entirety through governance reforms. Rather, the only effective way of getting redress is to belong to one or two networks so that if one network grabs land, the grabbed land can be recovered with regained power.

The redistributive networks are structurally embedded. The “syndicates” are so entrenched that formal land administration systems often cannot operate in the desired manner; neither can the lower courts dispense judgments in a neutral way. The police and members of other law-enforcing agencies are often directly influenced by members of parliament (MPs) and party cadres. The structural nature of payoffs paves the way for the politically powerful to garner opportunities to exploit members of the general public (Figure 4.4).

If markets are to drive productivity growth, the expectation is that land transfers should be to smaller farmers. The peasants do not have the capacity to buy land due to high land prices as a result of purchases by people who are either remitting income from cities or abroad, or people who are buying for industry or other purposes. Because of the remitting income the demand for land increases from D_2 to D_I . As a result, the price increases from P_2 to P_I . At that price peasants cannot afford to purchase the land (Figure 4.5).

Productivity is a function of land, technology, capital, and labor. Land, technology, capital, and labor require investment. An important part of the production is land, and the price of the land does not depend on return on investment. Price is contingent upon either those who treat land as a saving or those who buy it for nonagricultural purposes such as setting up a manufacturing plant.

Suppose that,

L = land

B = labor

C = capital

T = technology

P = amount of crop per acre

$P = f(L, B, T, P)$

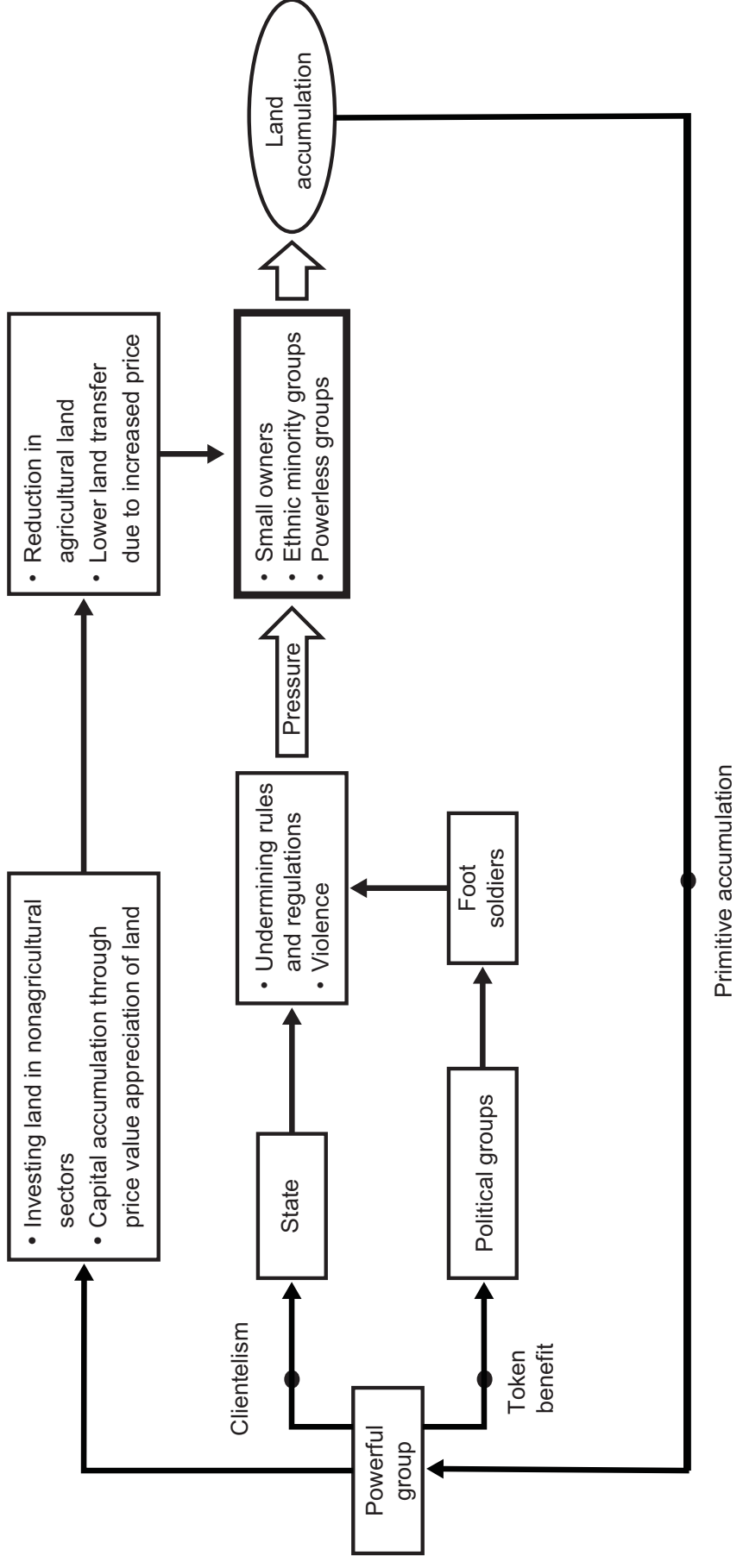


Figure 4.4 Networked power and land accumulation.

$$\frac{dP}{dt} = \alpha I \dots\dots\dots (4.4)$$

$$\frac{dI}{dt} = \beta L + \gamma B + \delta C + \mu T \dots\dots (4.5)$$

$$\frac{dL}{dt} = \sigma Pr \dots\dots\dots (4.6)$$

Here,

- α = rate of change of investment
- β = rate of change of land
- γ = rate of change of labor
- δ = rate of change of capital
- μ = rate of change of technology
- σ = rate of change of the price of the land

Productivity thus depends on investment, which again depends on labor, capital, and technology. Equation (4.4) implies that the amount of crops per acre depends on the rate of investment, and the rate of change of investment depends on the rate of change in land, labor, technology, and capital shown in Equation (4.5). Labor, capital, and technology cannot work without land. Farmers cannot cultivate if there is no land or if they can't get it at prices they can offer within their means. But prices are not determined by return on their capital. Prices are mostly dependent on the offers made by people whose livelihoods are not dependent on farming, as shown in Equation (4.6).

Suppose that M = price of the land as saving. In real life, $M \propto t$ where t = time. So, the price of the land as saving increases over time. Thus, the poor farmers cannot afford to buy land based upon income derived from agricultural produce.

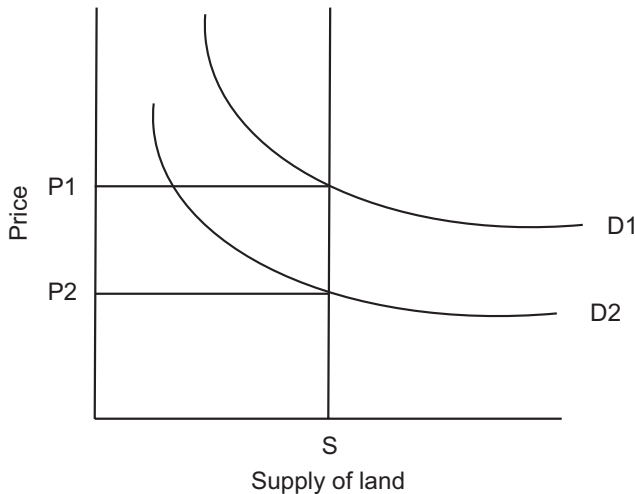


Figure 4.5 Price and supply of land.

The common interpretation of conflicts over property is that they are the outcome of bureaucratic governance failures and they impact all classes. For example, H. Z. Rahman (1996) provides evidence that, in rural land disputes, farms of all size classes can gain or lose land, with no significant evidence that bigger farmers are benefiting at the expense of the smaller, and concludes that the problem of rural insecurity and the instability of land rights is not a class issue, but rather an effect of administrative and institutional failure. According to such interpretations, conflicts relating to privately owned lands occur due to weak recordkeeping, corruption, and administrative weaknesses. The complex nature of the land administration system, involving two ministries—Land and Law—without sufficient coordination, is often cited. Besides, several other agencies such as the Ministries of Forest and Fisheries, the Directorate of Housing and Settlement, and the Department of Roads and Highways are also involved with issues relating to land. Within the Ministry of Land, there are three different authorities, namely the Directorate of Land Records and Surveys, the Land Reforms Board, and the Land Appeals Board, again creating confusion and corruption opportunities. The primary duties of these agencies under the Ministry of Land are to oversee cadastral mappings, establish and maintain property records, assess and collect the land development tax, settle *khas* lands and the appeals on it, manage abandoned and vested properties, protect tenants' rights, and so on. The registration department under the Ministry of Law, Justice, and Parliamentary Affairs maintains records of changes in land ownership arising from sale and collects the immovable property transfer tax.

The problem is not simply one of complexity nor of poor bureaucratic capabilities. The disputes on land are driven by the systematic involvement of factional clientelist politics and the use of political power to distort a wide range of land transactions. S. A. Khan's (1989) study of three villages in Bangladesh over the period 1975–1980 documents such an understanding of accumulation prevailing in rural Bangladesh.

A capitalist-type transformation in Bangladesh agriculture requires a specific trajectory of political, institutional, and technological conditions. An optimal combination of these variables can come together for some farms in some regions, such as in the village of Srimantapur. Although fragmentation and land scarcity pose obstacles to productivity in this area, the political, institutional, and technological conditions are robust enough that, to a large extent, constraints are balanced or overcome.

In all four villages, nonagricultural variables were extremely important for accessing and acquiring land. In “advanced” areas, like Comilla and Tangail, where market accumulation was more common and accumulation itself was minimal or stable, nonagricultural variables like income from remittances and business were useful, as were family and social networks and relationships, not necessarily with powerful people. In contrast, in “backward” areas like Noakhali, primitive accumulation was the norm and large swaths of land were being grabbed. Here nonagricultural variables were more pronounced: direct access to political power and institutional channels and to markets for

technology enabled the powerful, regardless of whether they had prior landholdings in the area or not, to accumulate rapidly and productively. This primitive accumulation could not occur without the participation of the state and legal and formal institutional frameworks as well as connections with private interests.

The situation is different from the prototypical capitalist model of agricultural transition where power overlaps with land ownership in such a way as to facilitate the concentration of land in the hands of a very few. The relationship between land and power is tenuous when land ownership in general is considered. Large landowners tend to exert more power, but it is by no means a direct causal relationship (Table 4.4).

Looking at the correlation between land ownership and power, specifically with reference to the categories of declining, stable, or increasing landholding, households

TABLE 4.4 Land Ownership and Power Relationships

	% OF HH			
	NOAKHALI	COMILLA	BOGRA	TANGAIL
NONHOLDERS				
NO POLITICAL INVOLVEMENT	92.3	92.8	98.9	99.2
POLITICALLY INVOLVED	6.4	6.3	0.7	0.4
UNION MEMBER	0.5	0.6	—	—
VILLAGE LEADER	0.9	0.3	—	—
OTHER	—	—	0.4	0.4
SMALLHOLDERS				
NO POLITICAL INVOLVEMENT	99.0	91.4	96.1	99.4
POLITICALLY INVOLVED	0.5	7.1	1.9	—
UNION MEMBER	—	0.4	—	—
VILLAGE LEADER	0.5	1.2	1.9	0.6
MEDIUM FARMERS				
NO POLITICAL INVOLVEMENT	92.5	88.7	92.6	99.0
POLITICALLY INVOLVED	6.5	7.5	3.7	—
UNION MEMBER	—	—	—	—
VILLAGE LEADER	0.9	3.8	3.7	1.0
LARGE FARMERS				
NO POLITICAL INVOLVEMENT	92.3	—	—	100.0
POLITICALLY INVOLVED	7.7	100.0	—	—
UNION MEMBER	—	—	—	—
VILLAGE LEADER	—	—	100.0	—

Source: Field survey.

TABLE 4.5 Relationship between Politics and Landholding

	FREQUENCY	PERCENT
HOUSEHOLD IN DECLINING NATURE		
NOT INVOLVED IN POLITICS	120	92.3
INVOLVED IN POLITICS	8	6.2
VILLAGE LEADER	2	1.5
TOTAL	130	100.0
HOUSEHOLD OF GROWING NATURE		
NOT INVOLVED IN POLITICS	117	90.0
INVOLVED IN POLITICS	12	9.2
VILLAGE LEADER	1	.8
TOTAL	130	100.0
HOUSEHOLD OF STABLE NATURE		
NOT INVOLVED IN POLITICS	174	96.7
INVOLVED IN POLITICS	3	1.7
UP MEMBER	1	.6
VILLAGE LEADER	2	1.1
TOTAL	180	100.0

Source: Field survey.

that have increased their holding have more political or other sources of power compared to declining and stable households (Table 4.5).

Surprisingly, households that have stable land ownership are hardly involved in politics at all, which may mean that households that are not involved in, or threatened by, primitive accumulation tend not to be involved in politics. Owners of land who are involved in politics are more likely than others to experience increases or declines in the land they own. In the field-level interviews, when asked directly about relationships with formal networks of power and allegiances that families may have with powerful organizations, as expected, most respondents rejected the importance of power. But as the conversation progressed, power, though veiled, was a central theme. Of those who said they had power, only 3 were large farmers, 63 were medium farmers, and 11 were smallholders, implying that medium farmers are mostly involved in political networks as is exhibited by the preponderances of intermediate classes. The three large farmers have held constant assets over time (between 1980 and the present), whereas the medium farmers experienced much greater fluctuations in ownership of land. This indicates a correspondence between medium farmers (members of an “intermediate class”) and fluctuations in the political sphere. If their factions are in power, medium farmers gain land and vice versa.

The process of acquisition of land leading to land concentration is not always pursued by the peasantry themselves, but by an external intermediate class who have greater access to nonagricultural earnings. While there is some shifting of smaller parcels of land between community members in the villages, these are not substantial enough to lead to concentration. Many such land purchases are facilitated not with earnings from an agricultural surplus, but from earnings from outside of agriculture. Larger purchases of land in the four villages were made by “outsiders,” such as businessmen who normally lived abroad, politicians and industrialists based in city areas, or migrants returning after lengthy periods abroad with substantial savings. This may contribute to the limited concentration discussed above, where 1% of the population holds 10% of the land, a ratio that is substantially higher than it was in 1960, when roughly 10% of the population owned 30% of the land.

Thus, the exercise of organizational power has a number of dimensions. People not closely tied to land use their ability to mobilize resources to acquire land through political channels, with pervasive bribery and political kickbacks. This is different from the use of economic power measured by resources and based in the rural context on the ownership of land. While the distinction between economic and organizational power has just been drawn, the two are certainly related when it comes to land relations.

In each of the villages, specific power nodes could be identified by repeatedly getting the same information from respondents, but general findings about power can also be applied more broadly across villages: power differences between classes, between the owners of the means of production and the producers (for example, between fertilizer dealers and farmers), between institutions and farmers (for example, power exercised by NGOs both in their lending practices as well as their business investment strategies). The important fact emerging from the fieldwork was that power is based not only on land, but on access to wealth from nonagricultural sources. The income, power, and influence generated by the increasing involvement of the rural population through migration, business, education, and the like had a greater impact on land acquisition and productivity than is accounted for in most theoretical discussions.

Power acquired from nonmarket and nonagricultural sources can support primitive accumulation of land as depicted in national statistics as well as in the village-level surveys. Primitive accumulation is largely supported by political factions at the local and national levels. These conflicts, however, are linked not only to political power struggles, but are tied into the market, with capital accumulation based on land.

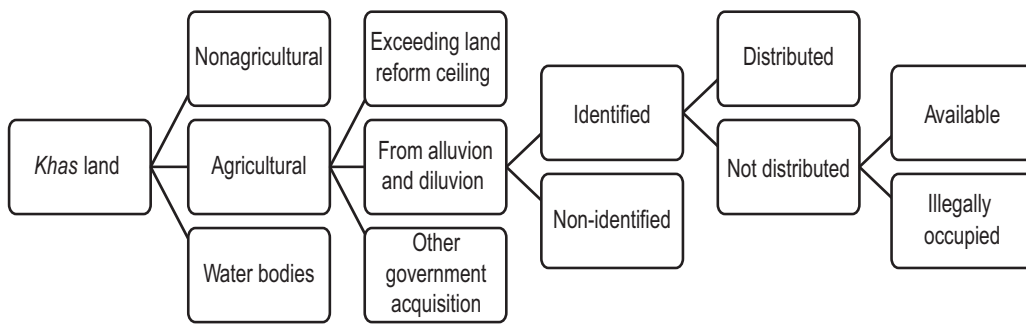
Political accumulation involves a two-way relationship—a client depends on material benefits distributed by a leader, while the latter depends on the former for being part of the organizational force at the ground level. Hundreds of cases are reported in the newspapers every year about the distribution of resources to foot soldiers in the

form of party cadres, which allows their bosses to engage in the unlawful leasing (grabbing) of public lands.

Being a high population density nation, there are many variations of land grabbing in Bangladesh. Land governance is not merely a legal issue; it is embedded in social, economic, and political processes. Land rights are insecure to some extent because of an inefficient, expensive, and corruption-prone system of land titling and registration (Uddin & Haque, 2009; USAID, 2010). But the main driver is the politics of organizing patron-client factions that allows organizers at all levels to participate in primitive accumulation at their respective levels. Violence has become a common phenomenon in establishing ownership rights over land resources (ADB, 2004). Quite frequently, *khas* land (public land) is distributed to ineligible households (ADB, 2004; Muhammed et al., 2008; World Bank, 2006). The grabbing of public land is endemic, though available data on the extent of grabbing and illegal logging are limited and varies across sources.

Feldman and Geisler (2011) examined three sui generis Bangladeshi land grab experiences. The first is in *char* areas, newly formed islands. These *chars* are in a constant state of formation and erosion, which make them contested sites that are ripe for grabbing, and this directly affects small producers who settle on or adjacent to them to cultivate their rich alluvial soils. Frequently peasant producers are forcibly removed (ex situ displacement) or reduced to subordinate positions in struggles over the limited resource (in situ displacement). In a second case, land grabbing results from government confiscation where its justification is cloaked in the logic of national security and nation-formation that is experienced as ex situ displacement. The Vested Property Act (and several antecedent laws) were the draconian means by which the East Pakistan and subsequently the Bangladesh state seized property from “enemies of the state,” primarily Hindu farmers. Though very recently withdrawn, the legislation established precedents for new relations of enclosure. In the third instance, land grabs or land capture by the Bangladeshi elite is mediated through privileged access to government through bribery and coercion of land officials to transfer title. Here gangs can be deployed to harass legal owners, primarily peasant proprietors, so they will relinquish their holdings. This back-door land-grabbing strategy violates property rights through corruption and coercion that results in in situ or ex situ displacement of owners and tenants.

There are a number of different types of public or *khas* land, which includes surplus land, riverine *char* land, forests, riverine wetlands, and inland water bodies (Figure 4.6). The government estimates that 35.7% of *khas* lands are in the possession of illegal grabbers, while Barkat et al. (2001) suggest the figure is 33%. In the case of vested property, the grabbers encroached on about 69% per government statistics, while Barkat et al. (2001) estimated 90% of such properties are illegally held (Table 4.6). The data on

Figure 4.6 Types of *khas* land in Bangladesh.

waqf properties are only available from the government, which shows that over 77% in that category is grabbed by the encroachers.

The most common type of land grabbing occurs by creating false documents and then using court decrees to confirm ownership. Most land grabbers are influential persons who get land administration and management departments to assist them in forging documents. Statistics differ widely about the percentage of land acquired through land grabbing, but the percentages are always significant (Hilhorst & Porchet, 2012; Uddin & Haque, 2009).

The government of Bangladesh maintains a *khas* land allocation program that grants 99-year rights (leasehold) to landless households ranging between one and three acres (depending on land quality) at no cost. The distribution of *khas* land to landless households entails a lengthy process, and applicants for land often pay bribes at several stages. The powerful either illegally occupy these lands or use mechanisms to distribute these lands among their clientele, in most cases to “nonpoor” cadres and musclemen who can be used for further primitive accumulation. In forest areas similar networks are involved in cutting trees and grabbing forestland. The vested groups are usually comprised of local influential persons and political leaders. There are vast tracts of wetlands in Bangladesh, which are public property. The government has divided the wetlands into

TABLE 4.6 Encroached Land in Hundred Thousand Acres

LAND TYPE	BANGLADESH GOVERNMENT ^a			BZR ^b		
	AVAILABLE	ENCROACHED	%	AVAILABLE	ENCROACHED	%
<i>Khas</i> land	14	5	35.7	33	10	33
Vested property	6.43	4.45	69.2	21	18.9	90
<i>Waqf</i> property	9	7	77.1	—	—	—

a Source: Report of the Parliamentary Standing Committee on Ministry of Land submitted to Parliament in 2004.

b Source: Barkat et al. (2001).

several units (namely *jalmahals*). The government has initiated a distribution policy of these *jalmahals* by specifying the types of people who can get leases, often the poor. But once again the process is modified through the exercise of political influence. All these practices require the display and use of muscle, which, in turn, severely threatens human security as rights are violated; life becomes insecure with the *mastans*' terror. In addition, ineligible persons may be in possession of the allocated land, leaving the beneficiaries of the land allocation relatively powerless to assert their possession rights (Shafi & Payne, 2007; Uddin & Haque, 2009). According to the Barkat et al. (2001) estimation, if agricultural *khas* land (only the identified areas) is distributed equally among the landless households, the per capita household availability for allocation is 0.37 acre, and this could rise to 1.52 acres on average if agricultural land, nonagricultural land, and water bodies are combined. The estimation suggests that wealthy and influential people have been the beneficiaries of the distributed *khas* land: Between 1980 and 1996 88% of the distributed 12-lakh acres of cultivable *khas* land went to wealthy and influential people against only 12% to the landless. Such a distribution deprives the poor from accessing the resources that are earmarked for them. The direct impact is the loss of a potential opportunity for the poor, with severe implications for the social and political life of the marginalized. They have virtually nowhere to go to secure their legitimate claims, or they are forced to become foot-soldiers of factions in order to access their legitimate claims.

As Lenin (1899) noted, the immanent tendency of capitalism is not to develop agriculture but to dispossess peasants of their land and other means of production, which in areas of settled peasant agriculture can only occur over a period of time. The smallholders who were dispossessed and displaced were forced to rely on their labor for subsistence, a labor that was increasingly tied to the shrimp and fishing industry growing under the guidance of government-facilitated "projects." This "accumulation through encroachment" characterized by the taking over of common property, or the property of noncapitalist petty producers, is distinct from the "accumulation through expansion" model that is assumed in the description of the productive transition outlined in the neoclassical model.

While power was being used to acquire land, it was particularly damaging to smallholders and their productivity. When land is acquired by those with power, it does not necessarily lead to the compulsions toward productivity that according to Marxist perspective corresponds with capitalist development. In Noakhali, there also seems to be a time lag between land concentration and increased productivity. Much land has been grabbed, taking it out of the hands of people who were using it for immediately productive purposes (survival) and putting it into the hands of powerful people (politicians, industrialists, businessmen, migrants) who to a large extent were simply waiting. They were waiting for the land to become more valuable as the competition over this

area, which is lucrative for aquaculture, becomes even more intense. While owners (legitimately or not) wait for the right opportunity to sell or exchange the land for other things, the land lies unproductive. Even where land is being used productively, for example, in cases where aquaculture in the Noakhali region was underway, its productivity did not generate a capitalist cycle of accumulation, facilitating a transition to capitalist agriculture. This is because power was fragmented and unstable, and land was continuously changing hands between the powerful, whether through market or non-market transactions. This continuous shifting did not allow the time for a landed elite involved in agribusiness to achieve sustained productivity growth.

One important aspect of primitive accumulation is that it is primarily a redistribution of claims to already existing assets and resources, rather than the creation of new assets. It is an accumulation of rights. This is important with regard to the situation in Noakhali because it underpins the activities of the state-elite partnership to acquire land and other resources through a process whereby the rights of access and usage of already existing resources were being redistributed and transferred. Another reason why primitive accumulation may not lead to increased productivity is that it may not be in the interests of the powerful, whether wealthy “outsider” businessmen or politicians, or locally based NGOs, to invest in technology, for instance if their time horizon is short. An analysis of power should not be limited to party politics. NGOs and other non-state actors are pervasive in rural Bangladesh, and their power is sometimes not linked to parties and may not be undermined if and when shifts in the political realm occur.

SUMMARY

The experience of Bangladesh is distinct from classical agrarian capitalism where free labor works for a small elite class that owns land and resources. Although labor in Bangladesh is largely untied from land and thus “free,” agriculture has many noncapitalist features. This particular form of capitalism has not yet eliminated smallholders. Although landlessness has been increasing, smallholding is actually more dominant than in the past.

A number of important trends have emerged from the fieldwork. Land productivity often does not increase after a transaction regardless of whether the transaction is voluntary or forced. While primitive accumulation of land is occurring in some areas at a high degree, it is not driven by or driving a capitalist compulsion to produce and generate more surplus. Thus, this is not in conformity with the classical capitalist transition.

Land is being transacted not for the generation of a surplus in agriculture, which would in effect have a positive overall effect on productivity growth, but for the generation of wealth by other means, particularly land value appreciation in a land-scarce

economy. If land is being used for capital accumulation, it is by gaining value over time or by facilitating political and economic investments in other sectors that will generate income. In the case of nonmarket transactions of land, there is, therefore, no evidence of this driving the emergence of capitalist compulsions.

Nonmarket transfers of assets involve huge injustices and social waste. Primitive accumulation is a process by which the politically, socially, and economically powerful secure benefits at the expense of the powerless. Political factions and state functionaries form coalitions to undermine the rules and regulations concerning public land, water bodies, forests, hills, and private properties. The orthodox preaching of administrative and legal reforms to safeguard the underprivileged cannot ensure the protection of the powerless unless the political underpinning of this particular system of accumulation is addressed. More worrying is that this particular process of accumulation has given birth to a primitive accumulation.

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AGRARIAN ACCUMULATION AND CAPITALIST TRANSITION

INTRODUCTION

This chapter examines accumulation and agrarian transformation, noting the shifts in land relations, productivity, and class relations in response to the influences of the state and market. It is important to encounter the widely held and firmly entrenched assumptions. In doing so, the chapter explores the factors constraining the capitalist transition in agriculture in developing countries.

Agrarian transition differs from country to country. There is no one version of the process that is applicable across cases. Rather, there are different accounts of the process of capitalist development. These differences arise not only from the diversity of historical experience but also from contending interpretations of the causality at work in specific cases. The debates, particularly in Europe and South Asia, also raise questions.

Mainstream theories are dominated primarily by neoclassical principles that consider questions pertaining to efficiency and not so much on the nature of primitive accumulation and agrarian transition. The core debate revolves around the question of whether the growth of the market is the key driver of capitalist development in agriculture (Sweezy, 1976) or whether it is only a catalyst (Postan & Hatcher, 1978), such that its effectiveness particularly depends upon the preexisting class structure (Brenner, 1976, 1977; Dobb, 1963, 1976). Only by defining the alternative ways in which the market relates to peasant production is it possible to specify the role that it can play in the differentiation of the peasantry. Likewise, whether such differentiation is historically followed by capitalist transformation depends on the ability of the preexisting relations of production to establish dominance upon the market and its growth. It is, however, noted here that capitalist development represents only one outcome among the numerous patterns that a change could induce. When an attempt is made to establish the causality of the process, the possibility of alternative outcomes cannot be ruled out beforehand.

In a peasant agriculture system, many of the productive and distributive activities take place within the productive unit and do not enter the market (Kautsky, 1976; Lenin, 1960). The peasant households usually do not need to participate in either lease or labor markets. They do, however, participate in product markets to sell part of their output and buy nonproduced goods. In effect, they constitute a set of equal and independent agents, who are mutually interdependent because of commodity exchange (Kautsky, 1976). Both Dobb and Sweezy are of the opinion that simple commodity production does not constitute a separate mode of production and is historically found in conjunction with some other dominant mode of production (Dobb, 1976; Kautsky, 1976; Sweezy, 1976). The simple commodity producers, therefore, exist in subordination to exploiting classes such as landlords, merchants, or usurers. The operation of simple commodity production accordingly becomes part of a class system in which the peasants are subjected to coercion and exploitation in the way of extraction of surplus product (Dobb, 1963; Marx, 1954).

The peasants' participation in the market becomes a reality only in two cases: when the market fulfills its conditions of reproduction, and when exploitative arrangements put pressure on it (Kula, 1976; Marx, 1981). Thus, even though the simple commodity producer participates in common markets with the capitalists subject to identical price "rules," the nature of their participation differs. Capitalist production, on the other hand, is based upon wage labor, with productive units competing with each other for survival, generating a unique relationship between production and the market for reproduction.

Lenin and Kautsky in their analysis of the "agrarian question" argue that the accumulation of productive assets—in this case land first and foremost—by a few and a growing reliance on wage labor income among the majority is inherent within the development of capitalist production relations (Kautsky, 1976; Lenin, 1936). As this economic development takes place, tenurial transaction is transformed into ground rent in kind. This signifies not so much a shift with regard to the nature of the relationship between landowner and tenant, but the increasing marketization of the relationship. Surplus labor in this second stage is now expressed in the form of produce; tenants receive or keep a share of their product equal to their labors. As such, the producer directly confronts the landowner, and the ownership of the land becomes the basis on which surplus is appropriated. The origins of agrarian class differentiation can be traced to this second phase. Since in this arrangement it is no longer necessary for the rent to exhaust the entire surplus of the rural family, the possibility of differentiation and the possibility that the direct producer may, in turn, exploit others generally arise. The third form of rent relationship observed by Marx, changing under the impact of an expanding money economy, is ground rent in cash. On the other hand, this simply represents the shift of produce rents into money, but more importantly, it signifies the departure point for the development of capitalist relations. The emergence of money rents presupposes "a considerable development of commerce, of urban industry, of commodity

production in general, and thereby of money circulation. It furthermore assumes a market price for products, and that they be sold at prices roughly approximating their values, which need not at all be the case under earlier forms” (Marx, 1954). With the development of money rent, tenancy may take various forms within contracts. It then becomes possible for tenants to emerge as independent proprietors, or for capitalists to lease in land. This development was (in Europe) and is assumed to be (for example, in a developing country context like Bangladesh) accompanied by the rise of a class of laborers on the one hand, and wealthy tenants—a sort of precapitalist class—on the other. These rough stages, observed in Western Europe and elsewhere by Marx, represent the agrarian transition through shifts in tenure relationships that lead from feudalism to capitalism.

It is in this context that the methodology of Lenin is highly relevant. Lenin emphasized the need for an analysis of reality and “fit” situations into neat theoretical frameworks. In *The Development of Capitalism in Russia*, Lenin gathered the latest economic data to show that Russia, despite its overwhelmingly agrarian character and limited number of industries compared to other European countries, was well on the road to capitalist development.

While Marxist contributions toward an understanding of Bangladesh are extremely useful, it will be argued with reference to the four cases that in many ways, such explanations need adaptation and expansion in portraying the complexities of agrarian relations in Bangladesh. Fieldwork findings will be discussed following a treatment of the theoretical terrain. Evidence relating to tenancy that corresponds to the various forms of accumulation that are prevalent in Bangladesh will highlight interclass and intervillage differences and place these in the context of the country’s arrested agrarian transition.

As will be seen, even within one country, the different tenurial arrangements that emerge and are upheld, or which shift according to changes in socioeconomic structures, represent the complexities in the agrarian transition. In certain villages it appears that sharecropping systems of the rent-in-kind nature have not only persisted but have gained popularity. In other villages, forms of mortgaging agreements have emerged and rapidly expanded to meet changing needs and demands.

CHANGES OVER TIME

It is important to highlight at the outset how different the historical development of Bangladesh is compared to the cases on which the theoretical positions laid out earlier in the chapter are largely based.

Land relations in Bangladesh have been shaped by power. In the precolonial era (up to 1765), rural Bengal was already tightly integrated into local and external trade

networks. Cash crops, industrial products, and handicrafts were exchanged for goods from other areas in the region. Sharecropping, mortgaging, borrowing, lending, landlessness, and agricultural labor systems were all prevalent before the era of the Raj (Van Schendel, 1981). Evidence suggests that wages were paid, as they continue to be, in cash and in kind (i.e., rice). The Mughal state extracted revenue from rural areas by way of land taxation, which was collected by *zamindars*. In the colonial period (1765–1947) significant political and economic restructuring affected the region, which was necessary to align the local economy with the needs of the empire, or metropolis. The extraction of primary resources and the collection of land revenue were the two primary concerns of the East India Company. The latter objective also required the establishment of the colonial state apparatus.

This process required a refashioning of the *zamindari* system and the monetary policies of the prevailing order to reorient the economy as a supplier of raw materials and revenue. The impact of the shift on rural Bengal was not, however, as in other colonial experiences, to destroy the existing agrarian framework as such. Rather, it was more beneficial to effect “a realignment of relationships over, and not within, the village” (Ray & Ray, 1973). In other words, instead of restructuring class relations at the village level to meet the demands of new forms of accumulation at the macro level, the existing inequalities in rural areas were made functional for these purposes, and thus made more “fixed” than flexible. Essentially, the primary relations of production remained the same between elite landlords or moneylenders and the indebted tenants who sharecropped the land.

Dominant groups at the village level had very little incentive to increase agricultural productivity through a revamping of the tenurial framework. Ending a system of sharecropping would not only have the effect of undercutting the landlords’ ability to expropriate surplus production, but also undermine their reaping of profits from the indebtedness that sharecropping perpetuated. In the absence of urban markets, and with consumption levels remaining very low in rural areas, it was unlikely that productivity increases would balance the loss of income that power holders reaped from the system of sharecropping.

The colonial state did not pursue a radical overhaul of the agrarian system as it was not only unnecessary, but may have been counterproductive for extraction of raw materials. As such, the economic interests of the colonizers and the dominant rural classes overlapped to such an extent that agrarian relations were changed little in the process. Control over production processes and credit arrangements was left to the rural elite, leaving the agrarian system in a “frozen” state (Van Schendel, 1981). This stability locked the peasantry into a position wherein neither depeasantization nor proletarianization was possible, and thus, a stagnated agrarian transition persisted.

The stability of agrarian relations in Bangladesh has been undermined by the growth of the rural population. Overcrowding and lack of economic growth in rural areas,

beginning from the mid-1800s, gradually resulted in the downward movement of the peasantry. This gradual process did not, however, create disruption since the response of the peasantry has historically been one of adaptation rather than violent protest. This is not to suggest that violent protest did not occasionally flare up. As more of the peasantry was pushed to lower margins of subsistence, nonagricultural sources of income became increasingly important. Unlike in the current context, developments in nonagricultural activities certainly did not lend themselves to “modernization.” Rather, most of these activities were marginal and makeshift.

With the end of colonialization in 1947, these failed rural relations were still relatively untouched. Although the economy was reorganized to suit new objectives, the basic correspondence of interests of the dominant groups in the villages and those in power at state levels remained intact as both were from the intermediate classes, coming from, and keeping command over, rural areas. Bengali intermediate classes from East Pakistan tried for a long time to make Pakistan work in their interest. But with economic, military, and political power firmly based in West Pakistan, upwardly mobile Bengali intermediate classes felt hemmed in even within East Pakistan as if East Pakistan were an internal colony (of West Pakistan) during the Pakistan period (1947–1971). East Bengal agriculture was more tightly linked, through the jute industry, to the world market. Income from this booming industry was not, however, used to stimulate industrial development in East Pakistan (Bangladesh) since it was in West Pakistan’s interest to hamper independent capitalist development in the region and funnel foreign exchange earnings from the jute industry into West Pakistan. As such, the shift from wealthy peasant to capitalist, or the “depeasantizing” of the rural elite, was still hampered and the scope for investment outside of agriculture continued to be limited. Sharecropping arrangements thus prevailed.

In the 1960s, using foreign capital, the state sought to revitalize the agricultural sector through a variety of rural development programs such as the Comilla program and the Integrated Rural Development Program (IRDP). These efforts, which pivoted on the introduction of high yielding varieties (HYV), did not eventuate in the rise of capitalist farming that was the intended result. Again, this failure is marked by the resilience of agrarian class relations. Because poor cultivators were unable to afford new technologies and wealthy peasants were hesitant to adopt them for fear of disrupting the profitable arrangement they already enjoyed in the villages, these new techniques were not adopted as broadly as hoped. Those who could afford to adopt new technologies successfully were “careful to re-invest outside of agriculture so as not to endanger their income from sharecropping and usury” (Van Schendel, 1981).

Some extent of differentiation did occur as a result of these processes as more households were able to “depeasantize.” This upward mobility, however, was minor and as such, no clear polarization was evident in Bangladesh’s agrarian history in the way described in the pure theoretical framework. Rather than the polarization of two groups

into capitalists and proletariats, the shifts in Bangladesh's agrarian structure were much smaller, involving the "transformation of small groups of wealthy peasants into landed bureaucrats, merchants, and military men. These people remained involved in agriculture as absentee mini-landlords giving their land to sharecroppers" (Van Schendel, 1981). The involvement of the state in the rural sector has historically led to landlord absenteeism that was based on continued peasant production in agriculture and did not facilitate a transition to capitalist agriculture.

Bangladesh's agrarian structure is only partially differentiated, and it does not resemble the Western European contexts in which the capitalist owns most of the land and the majority are forced into a labor contract relationship with the owners of the means of production. Nevertheless, landlessness is growing, yet this is more as a result of demographic and ecological factors than due to accumulation of land by the powerful. Though smallholding has been proliferating while large landowners became fewer in number over the years, inequality in landholding widened as large landlords account for more land.

Looking at the input market, Bangladesh's agricultural economy has become much more critically dependent on the market for the supply of inputs. Although the existence of both the private property in land and wage labor in agricultural production suggested that two necessary conditions for the emergence of capitalist relations were present, such changes have been insufficient to transform the character of agriculture because of the failure of a rural capitalist class to develop and reproduce capital.

In the first two decades after independence (1971 onward) this trend remained rather stable; the village elite, linked continuously and increasingly to the state apparatus, continued to control the processes and means of production at the village level. Van Schendel (1981) refers to the relationship between agriculture and the state in Bangladesh as a process of "compression": "the distance between peasantry and state decreased and the power of dominant village groups vis-à-vis the state increased. This process contributed to the strengthening of the position of these groups within the peasantry." The maintenance of an agrarian structure did not lend itself to capitalist development.

Since the 1990s, with the shift to a market-based economy, capitalist forces have penetrated rural areas unevenly and with differing effects. To a large extent a reversal of the "compression" trend has occurred as the space between the state and agriculture expanded to include a chain of market-based intermediaries. Increasingly since independence, the state has been dependent on international commercial and political interests, and major parties have subscribed to the ideology of neoliberalism. As the ideology of neoliberalism started becoming grounded in politics and policy making, the share of official assistance has declined remarkably. This shift has created new inroads for the elite and in certain areas agrarian structures have been preserved, even as rural

areas are increasingly opened up to market forces, but in other areas it has led to new opportunities for the peasantry. These opportunities, however, do not necessarily always lead to increased productivity in agriculture and capitalist transformation.

Given the contradiction between the short-term need of the powerful to remain in power for a particular electoral cycle, and the long-term need to foster the development of agriculture, it is less likely that the government of the day will pursue a growth-enhancing agriculture strategy, though the tendency to use public resources for the purpose of securing political support for the regimes will continue. The state's institutional fragility and inadequate administrative capabilities, apart from its ever-rising capacities of coercion, also stands in the way of productive transformation.

The country witnessed different episodes of volatilities, as is the case in many developing countries across the world. The first government collapsed with the assassination of the country's leader in 1975. There were coups d'état and counter coups d'état, with a certain kind of civilian rule in between. Authoritarian and military rules finally ended in 1990 and the country moved to an era of competitive clientelism. The transition in 1991 brought a form of political peace because the configuration of power between and across intermediate classes was reflected in political institutions that gave all powerful groups a realistic chance of getting to power and accessing rents. The period witnessed a continuous growth of GDP, though primitive accumulation has continued to remain unabated and has increased over the years in rent-seeking, and a consequent worsening of some developmental outcomes. This era (1991–2005) was characterized by higher real wages from higher returns on factors of production. Investments and savings were higher than during the authoritarian regimes as the real wages grew.

After the two-year Emergency that followed the breakdown of elections in 2006, the regime in 2008 brought changes in the electoral laws by abolishing the Caretaker System, amended in 2011, through the Fifteenth Amendment to the Constitution. The economic and political outcomes observed in contemporary Bangladesh in the post-2014 period are, therefore, consistent with a direction of travel toward a “vulnerable authoritarianism” (Khan, 2017). During the authoritarian clientelism, elections were sporadic and elite groups and the members of the ruling regime captured rents. As a result, the return on capital was much higher and accrued only by the ruling regime. A rentier class was born and nurtured by the authoritarian regime. Primitive accumulation by this class resulted in capital flight and money laundering, which denied the nation much-needed investment. The government tended to control the political process and the factors of production. Return on labor, on the other hand, was lower during this period (Titumir, 2021).

Turning from the political settlement to that of agrarian transition, a classical capitalist mode of agricultural production is unlikely to be realized in Bangladesh, although

the appearance of certain aspects of capitalist development is apparent with the predominance of primitive accumulation.

Technology, in the marginalist tradition, is the source of growth. The most important factors that affect the adoption of a more profitable technology by different groups of farms are (a) the availability and cost of various inputs for different groups, and (b) the characteristics of the new technology compared with the old. Finance is relatively cheaper and more available to large landowners, whereas labor is relatively cheaper and more available to smallholders, that is, for tenants and small owners. In these circumstances a differential rate of adoption would be expected in the event of new technology being non-labor-intensive. If it requires relatively greater application of capital, it would be adopted relatively more often by large landowners (Griffin, 1974). Superior technologies in agriculture tend to be capital biased, and depending on the requirement of capital, it may lie outside the capacity of the tenant and the smallholders to adopt it.

The current policies are giving rise to certain degrees of polarization as consequences of shifts in the state's policy. The subsidies on agricultural inputs may force the large landowners to become more economically efficient, while at the same time an increase in the cost of inputs is likely to drive a large number of medium and small landholders into bankruptcy. The "social security net" of the village—already under tremendous stress—may crumble, leaving large landowners with little option but to fend for themselves at the cost of those who traditionally depend on them. Thus, current policies could result in intensification of peasant pauperization in the short run, and consequently continuation of massive urban migration, as the population censuses continue to reveal.

Another important factor likely to continue to retard the development of rural entrepreneurship is the insecure social situation in the rural areas. Rural insecurity, which arises from factors such as high population density and conditions of intense poverty, acts to inhibit accumulation and the development of capitalist relations, which constitute the *sine qua non* for the development of entrepreneurship. Within such an environment, no individual can afford to confine attention to simply bettering economic prospects. It is important to note that labor relations cannot be organized for such a task, nor can the state be entirely relied upon to provide security of private property and life in the countryside. At the same time, waged labor relations are difficult to reorganize in the cultivation process because of the problems arising from their labor-intensive character and cultivation on small, scattered plots, which makes large-scale, self-managed farming difficult and impractical.

Although agriculture has experienced many important changes, it is still very much in a state of transition. It is improbable that the socialist path, despite its promise of social equity and justice, would emerge as a practical alternative for Bangladesh, given the organizing capabilities of political parties that subscribe to such an ideology. On the

other hand, although the forces promoting a capitalist process of transformation may have gained strength, they are still far from sufficiently introducing a qualitative change to full capitalist relations of production in agriculture in Bangladesh.

The subsequent sections discuss the agrarian relationships observed in the four villages and the extent and forms of transition.

TRENDS IN AGRARIAN TRANSITION

The conditions in the villages witnessed a change as more and more members of the community left as migrants. Laboring on the land alone has proved to be a difficult way to maintain the family, even at a subsistence level. The influx of revenue from migrants did not drive productivity growth. While the compulsion to control more land is certainly prevalent, the compulsion toward productivity is not as strong. Several returning migrants, usually from wealthier families, had purchased tube wells using remittances. General standards seem to have improved. While these improvements arise as a result of increased capital flow, they do not necessarily suggest a compulsion signaling an agrarian shift toward full-fledged capitalism. Some tendencies toward capitalist agriculture are clear: polarization of land ownership, investment in ownership of land for future generations, distress about continued need for labor, emphasis on education and migration.

Mortgaging, a tenure system that did not exist, revolved almost entirely around the compulsions for financing the diversification of income for this pursuit. Mortgaging is now much preferred to selling land or borrowing from NGOs or banks, and it requires much less effort with regard to the institutional processes involved. It is a transaction that is relegated to larger and medium farmers. Since the rate received is roughly a fifth per land unit to what one would receive if the land were sold, only those with large enough parcels can amass the capital they need for substantial investments elsewhere by taking a mortgage. Larger farmers commonly will mortgage out parcels of their land, while continuing to cultivate a portion of it for the maintained subsistence of the family. The transaction offers people the ability to diversify investments by freeing equity for other purposes. For most rural people in Bangladesh, land is the foremost store of value that households have.

The risks associated with a volatile environment, such as that in Noakhali, and infertile soils that are high in salinity are part of what contributes to the preponderance of sharecropping practices. Many large landowners in this area are also “outsiders” who come from town or city areas—businessmen, politicians, returning migrants, and so on. With limited knowledge of local natural conditions, owners of larger farms can cut down on potential losses from imperfect information by sharecropping or leasing

out their land to smaller farmers. Renting or sharecropping the land may also bring a higher income than hiring labor because in addition to their superior knowledge, tenants have higher incentives to provide greater efforts than hired labor. In a sharecropping situation, for instance, the argument is as follows: Small farms have a productivity advantage with respect to the quality of labor, mostly family labor. This is related to incentive structures: "People will produce more for their family unit, working for themselves, than as employees in larger units, pointing to the frequent superiority of the smaller, self-managed family unit" (Lipton, 1993).

This logic breaks down, however, in the face of new technology, as larger farmers are likely to have better access to technology. In Noakhali, most respondents said moderately large farmers were more productive than smallholders because they could access and pay for agricultural inputs, prime among them being irrigation. It meant that moderately large farmers, even if they had sharecropped their land out, in providing some portion of the inputs to their tenants, could crop their land twice, thus doubling the production. If irrigation, fertilizer, and hybrid seeds were also used, productivity rose enormously in comparison to a small subsistence farmer who could barely grow enough rice to feed his family for a few months using local seeds. Irrigation resources used to be owned cooperatively but more recently, in response to the privatization of irrigation equipment, the larger landowners use their organizational and economic power to control irrigation and/or purchase and implement new facilities. In the case of Bangladesh, a ceiling on smallholding agriculture is evident, despite new technologies. A ceiling on the productivity of smallholding agriculture was also found.

Even where opportunities existed for off-farm employment, land continued to be of paramount importance in village life in all four of the villages visited. The extremes that small and marginal farmers are willing to go to, for example, paying exorbitant rents for leasing arrangements, debt rolling with a number of moneylenders and NGOs, and labor tying, speak of the continued importance of access to land. Even though shifts are apparent in tenurial arrangements, it is clear that the land market remains thin in villages with little access to outside opportunities. Sales and purchases of land are less common in these villages and land is highly fragmented. Distress land sales by the poor are the most common form of sale, and medium and large farmers, who use remittances, business earnings, or agricultural income, are the primary buyers.

There is a longing for land. The attachment to land suggests that a process of differentiation, as has been the case in the past, is resisted by smallholders who would rather be pauperized than proletarianized. While larger landholders can afford to alienate a portion of their land to fund investments elsewhere, smallholders find such a prospect unbearable and do whatever they can to cling to the land, which is their means to existence through what they produce on it, and their store of value if it should be needed to save them from periods of crisis. While these motivations are easy to understand, they do not facilitate a capitalist agrarian transition.

The argument of smallholder efficiency is based on smallholders' intensive use of labor and higher output per unit area. This observation, where it holds true, may alternatively be explained as an illustration of an inefficient mode of labor deployment. The intense work by these petty producers is *imposed* by the property structure, not chosen voluntarily by them. Small producers, in most cases, who are by and large mostly tenants, are *compelled* to produce a surplus profit equal to rent over and above an average profit by intensive use of labor, with a higher rate of exploitation. In addition, the prevalence of absolute ground rent is important to understand because as an institutionally fixed share of rental income, it acts as a barrier to investment.

The petty producers may be *forced* to acquire "new" technology in the wake of failing crops, despite rising input costs and falling profitability, to intensify acreage for sustenance, or to provide rent as tenants, simultaneously engaging in distress sales and plunging into indebtedness. Apparently robust forms of "family farming" (petty commodity production, "middle peasantry," etc.) in contemporary capitalism, where they exist—and which approximate the ideal advocated by Griffin, Khan, and Ickowitz (2004)—are themselves one *outcome* of processes of class differentiation. It is in this sense that smallholders are more productive than large farmers and large farmers do not invest in the productivity of their land. The data shows that there are no large farmers who are highly productive; rather, moderately large farmers are leasing out their land to smallholders, who are the most productive users. Regarding the question of whether high yield users are acquiring more land, the answer is no, since smallholders are the main users in this group.

As capitalist relations of production and exchange penetrate the rural economy, the benefits to productivity that new technologies entail can only be captured by larger farmers since they can deploy economies of scale and finance technology acquisition. Thus, the inverse size–productivity relationship breaks down with capitalist development, implying that much larger farms can reap greater gains on a per acre basis than do smaller farms. In the case of Bangladesh where "large" landholdings are actually very small in comparison to other capitalist countries, this complex relationship suggesting that the gains to technology require farms that are larger than the existing large farms in Bangladesh is one that is worth examining in future work.

The same is observed elsewhere. Social context, fertility of soil, farm management, all give rise to what Bardhan (1973) has called "a stylised fact" in traditional agriculture across the world. The emergence of the inverse relationship as coming out of class relations of exploitation in a setting of relatively backward agriculture compels poor peasantry to intensify their cultivation. Given the extensive participation of Srimantapur farmers in the labor market, both as hirers and sellers of waged labor, most farms cannot be considered "family labor farms" in the Chayanovian sense.

Farmers face important challenges in the interlocked markets of Bangladesh, especially smallholders. Rural credit and input markets are controlled by rural elites and

landowners. So, there is a fragile market structure prevailing for rural smallholders, which obviously does not work as Smith's invisible hand to ensure the welfare of all. The agricultural product market consists of at least three other markets. First, the market for land determines the terms and conditions of production of the marketed surplus and marketed supply. Second, the labor market is responsible for the wage and working conditions of labor. Third, the credit market is critical for financing investments. These three markets may be partially developed in a specific context. Empirical evidence from other areas also shows that interlocked money and commodity markets have promoted chronic indebtedness (Harriss-White, 1996). Similarly, monopoly profit has been found to be a component of "unorganized" output markets at the expense of producers (Lipton, 1977; Michie, 1978). The problem can be worsened by the structure of elite control (Bharadwaj, 1974, 1985).

The abovementioned market structure creates a vicious cycle for the small and marginal holdings as the market failure leads to creation of a barrier to inputs necessary for production. The input market includes land, labor, and credit. Lack of access to the credit market in this case restricts the small and marginal farmers from owning and using technology in production. Due to the lack of technology, a necessary condition for higher output, coupled with fragmented land and intensive labor, small farmers fail to achieve economies of scale. Hence, productivity diminishes for the small farmers, leading to even more marginalization in the rural economy. Large farms, on the other hand, see a virtuous cycle amid the market failure. Higher productivity is achieved by the large farms through economies of scale (Figure 5.1).

In Bangladesh, the average wage in the agriculture sector has been stagnant while agricultural marginalization has increased the number of landless people. Moreover, agricultural input costs have gone up with the continuation of the push for liberalization, initiated under the Structural Adjustment Programs (SAP). Globalized input markets have also pushed farmers into a corner. In a liberalized market, the bargaining power of the poor farmers has deteriorated. This occurred after the huge private imports of fertilizer and successive removals of subsidies from this sector. Successive rises of diesel prices are primarily responsible for the increased cost of irrigation. So, smallholders are in a vicious circle of rising costs of land—fertilizer—water. In addition, agriculture markets are also interlocked in urban areas with various stakeholders (Titumir & Sarwar, 2006).

The rice market provides a good example of an interlocked input-output market in Bangladesh. Producers in the advanced areas sell their product directly in the local *haats*. But in cases of sharecroppers and leases, a certain portion of their produce goes to landowners as agreed. Crops may also be sold to local husking millers called *chatahs*. Small brokers, on the basis of commission, collect paddy from the millers in the *haats* and big millers collect it from the brokers. There are also some brokers-cum-wholesalers who collect paddy for millers and sell it to the urban retailers. The big millers supply a

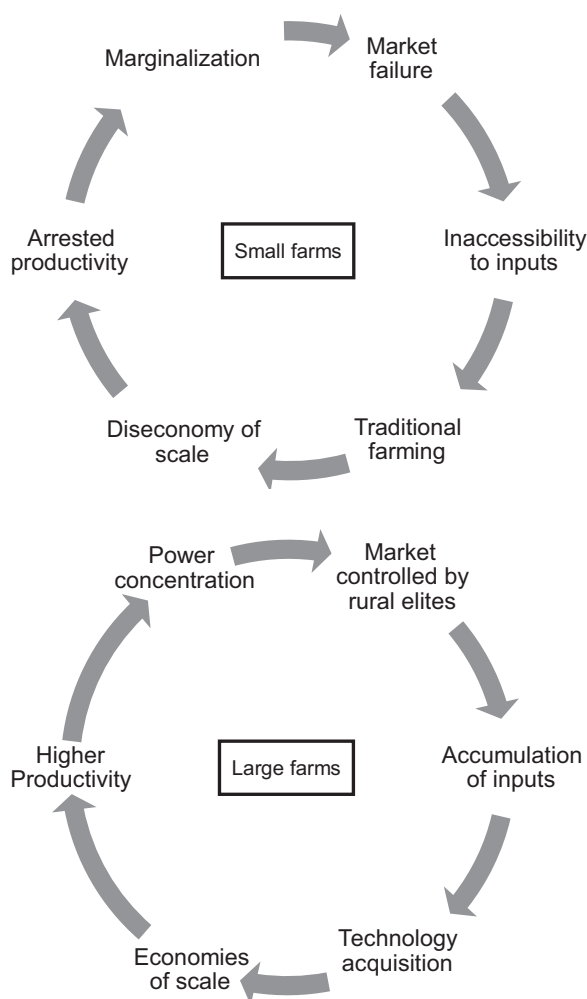


Figure 5.1 Productivity cycle: small farms (top); large farms (bottom).

large part of the paddy to the big regional brokers, while supplying a small part for government procurement. It is the big regional brokers who supply the wholesale markets in the metropolitan cities. Private traders, who import rice, supply it to the big brokers and sometimes to the wholesale markets (Figure 5.2).

There exists an informal market in the backward areas, where sales to neighbors account for a substantial portion of paddy. The producers have hardly any surplus to sell in the market. Middlemen eat up most of the profit, leaving a small amount for the growers. During procurement drives, the government procures a small amount of paddy or rice from the backward areas. The local millers get paddy from brokers who collect it from the producers. Sometimes the brokers, who give loans to poor farmers, buy paddy from them at lower prices as per the agreement between the two parties before the harvest (Figure 5.3).

To further illustrate how power relationships in interlocked markets have been affecting exchange relations against farmers, the fertilizer market can be examined.

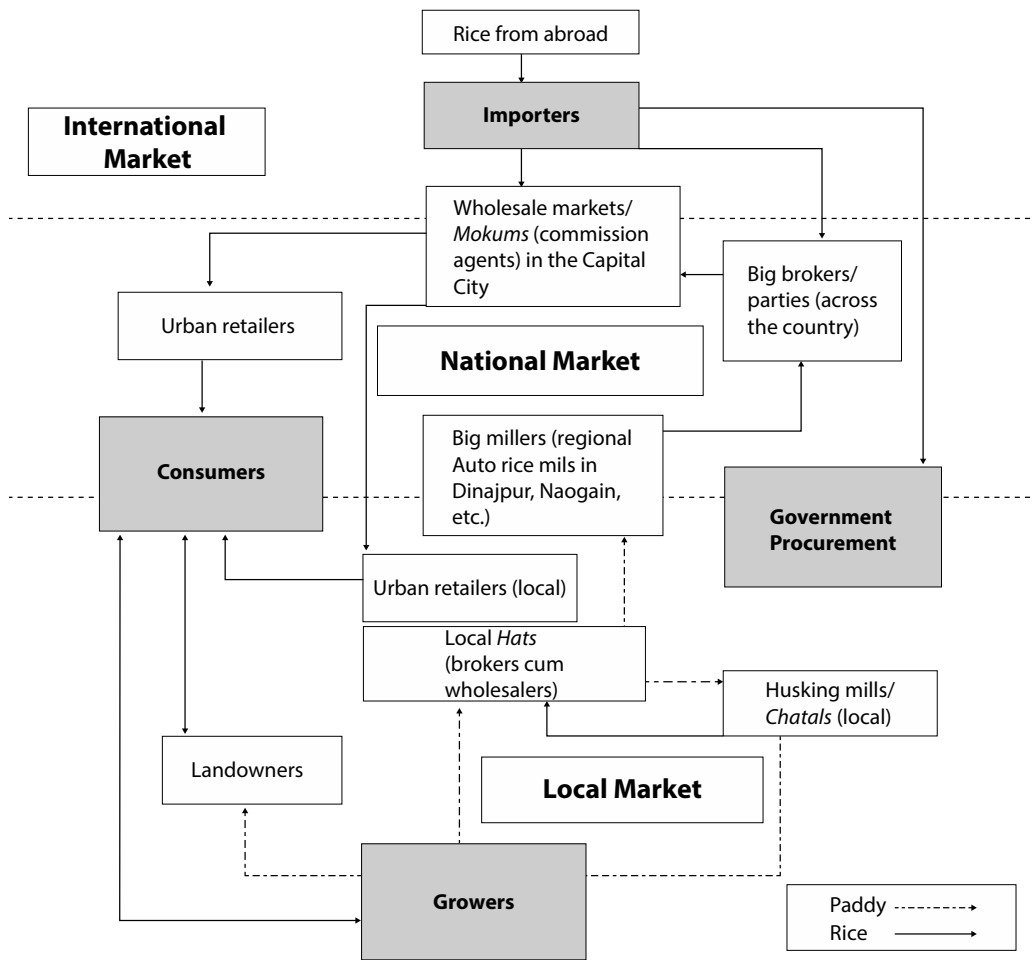


Figure 5.2 Rice trading network in the advanced area.

After liberalization of the agriculture sector, the fertilizer distribution that was previously under the sole control of the state-owned Bangladesh Agriculture Development Corporation (BADC) was opened up to wholesalers at the district levels. The majority of the wholesalers were either linked to political parties or were socially influential persons. Many of them were not even regular dealers (i.e., they were not engaged in the fertilizer business all year as they had other businesses), and they were only active during the peak season. However, they often forced regular dealers to raise the price of fertilizer through hoarding and syndication (Titumir & Sarwar, 2006).

The fertilizer market is found to be highly disintegrated, resulting in huge burdens, especially on smallholders. It is not feasible for them to go to the district or adjacent urban market for fertilizer as their fertilizer requirement is usually small. Moreover, the application of fertilizer is a time-bound phenomenon. As a result, they often had to buy fertilizer from local retailers at a high price. The farmers in Comilla and Tangail said that they were compelled to buy at a higher price in the peak season as they had no alternative but to give in to the “profit-mongers.” In the absence of support from the

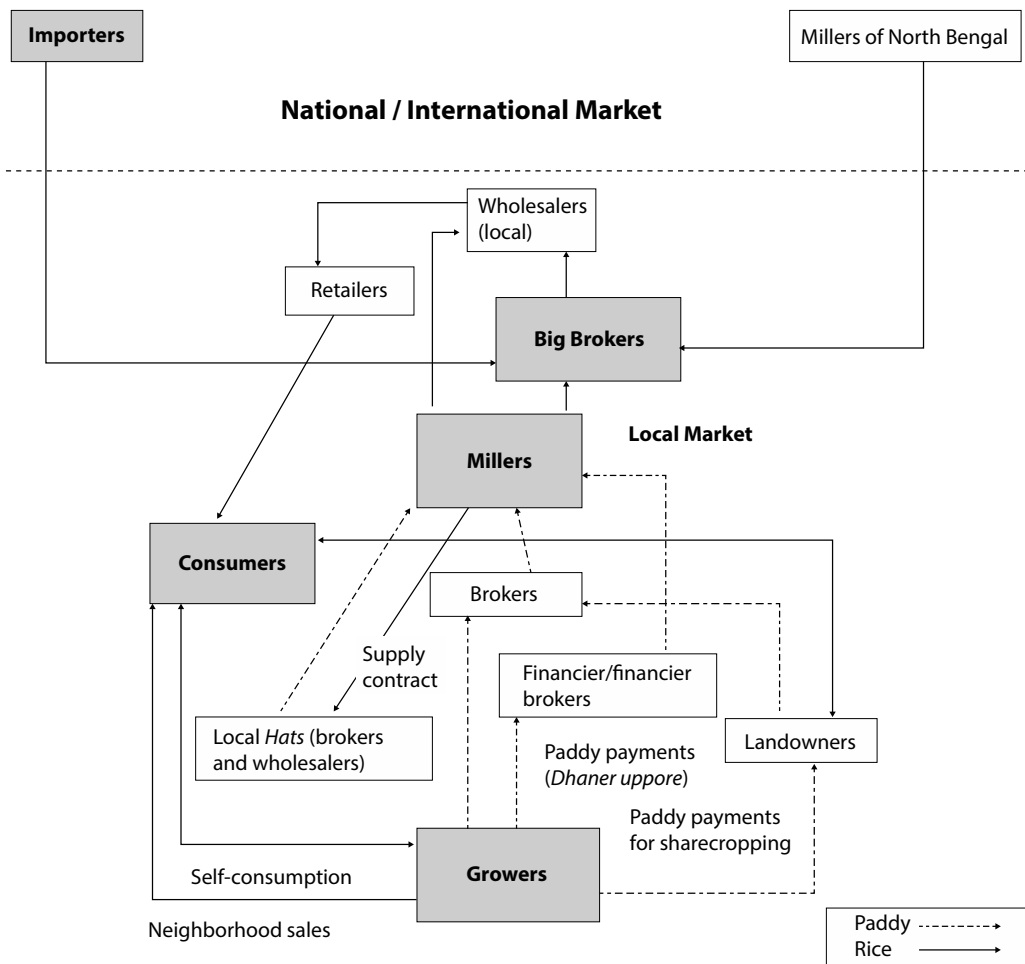


Figure 5.3 Rice trading network in the backward area.

state, which has focused on promoting liberalization, the problem of interlocked markets has had severe consequences for farmers.

POWER, FACTIONS, AND THE STATE

The functioning of economic activities at the microeconomic level rests on, and is reinforced by, the nature of *property rights*. Such a conception, though, cannot be completed without linking *power relations*. The consideration of power is a departure from neoclassical and neo-institutional approaches. For example, processes of maintaining power or transferring property rights, especially in landed property, may lead to a dynamic of instability. Related to property rights is the institutional reality of the state, which is neglected in mainstream analysis that suggests that agrarian transformation can be achieved through a series of technocratic institutional reforms. While the data from the field suggests that power defines processes of rent-seeking embedded in a given

political system, another associated theme that also merits inquiry relates to the symbiotic processes of global capitalism, the nation state, the role of international and bilateral financial institutions, transnational corporations, and the household.

Since the ruling intermediate classes consist of a variegated petite bourgeoisie, the exercise of state power by them has remained diffused and primitive accumulation has not proceeded in the direction of rapid proletarianization. State power is not in the hands of a single dominant class like rich landlords, and thus purposive primitive accumulation has not gone in this particular direction. On the contrary, many competing multiclass factions are involved, and a class concentration of landholdings has not happened. Consequently, policy making and praxis for development of agriculture have been the expansion of the state's ubiquitous influence on the economy accompanied by a dilution of its development impact, since the distribution of resources is determined by a diffused and competitive political patronage structure. The promotion of productive transformation is, thus, undermined despite widespread primitive accumulation, in the absence of rent distribution for production and productivity.

Beside the preponderance of the intermediate classes, another characteristic of Bangladesh is the existence of an overdeveloped state superstructure, which was created during the period of colonial rule (Adnan, 1989; Alavi, 1972) in South Asian countries. Although the origins of the state superstructure are such as to make its ideological bent toward capitalism understandable, the imperative of clientelist politics also limits the capacity of the state to actually develop capitalism. Therefore, the nature of the ruling class structure in Bangladesh has a number of inherent weaknesses, which limit the extent to which the state can promote a vigorous capitalist strategy. Clearly such weaknesses limit the extent to which the state is willing and able to promote a capitalist strategy of agrarian change. The state is also exhibiting a "tyrannical" aspect despite the claim that a free-market economy is based on voluntary and free exchanges between producers. Some aspects of this coercion by the state and their implications are given below.

The current myth of development based on "voluntary" exchanges cannot stand up either to logic or to the evidence of history. For example, the capitalist transition in advanced capitalist countries was based on significant internal primitive accumulation as well as the exploitation of their colonies. Second, the means of production, particularly land, has historically been reconfigured to create the compulsions for capitalist dynamism through processes that were not themselves capitalist. Applied to the present, capitalist agriculture in countries like Bangladesh has not happened through the processes of liberal markets alone. The field survey amply demonstrated the evidence of primitive accumulation in Bangladesh, but what is missing is the distribution of rent for a productive transformation, disciplining of the capitalist, and the impulse for the networks to direct such processes.

Capital has one motive: to seek profits. It is not intrinsically competitive, and if profits can be enhanced by seeking partnerships with the state, capital is always ready to

do so. In advanced countries, capitalists spend billions to influence politics through legal rent seeking. The question is how business–government relationships in the transitional stage to capitalism work. The specific networks that have been identified in the processes of primitive accumulation do not necessarily result in productivity-enhancing outcomes in Bangladesh agriculture. Furthermore, the institutional fragility and governance deficits are in connivance for predatory appropriation while disciplining and sanctioning for unproductive patronage are missing. The examples are all over, from Asia to Africa to Latin America, particularly by the rise of capture of the state by extra-constitutional means, or civilian oligarchy.

Colonial powers exploited preexisting religious and ethnic divisions in divide-and-rule strategies. They exploited and intensified ethnic tensions and systematically dismantled all the mechanisms that had restrained such tensions in the past. Following the departure of colonial powers, native rulers had to find ways of continuing these strategies of rule. The natural strategy was to rely heavily on exploiting tribal, ethnic, and religious divisions. This too has implications for primitive accumulation strategies, as is seen.

The transaction cost explanation given by the new institutional economics (NIE) for the slow growth of capitalism in many developing countries has been rejected, as the dynamics and the constraints of agrarian transitions can be best understood through an examination of class, power, and processes of primitive accumulation (Khan, 2004). The fieldwork also suggests that the real constraint to productivity-enhancing changes comes from the distribution of power between factions engaged in primitive accumulation. This is in consonance with the understanding that political bargaining processes driving institutional change depend on the “balance of forces in the struggle for power” (Hobsbawm, 1996). In other words, institutional developments are determined by the relative power of various agents, and this needs to be understood by the organization of politics in specific class and patronage contexts.

SUMMARY

First, the evidence from four villages demonstrates that capitalism penetrates into agriculture in extremely varied forms, with context-specific characteristics.

Second, the increasing trend of smallholdings contributes to differentiation to some extent, though it has not furthered it significantly to a point of structural change whereby large farm agriculture emerges to reap the benefits of economies of scale and efficient management.

Third, tenurial relationships have changed and continue to shift in Bangladesh due to specific circumstances. In most areas, sharecropping arrangements have declined dramatically, giving way to rental or mortgage contracts instead. There is financial deepening in rural economies through remittances, entailing the injection of capital into

the agrarian sphere from outside. Another factor is the preference to hold land as a store of value and avoid even the levels of risk associated with investments in inputs in sharecropping.

Changes in agriculture have failed to thwart the negative influence of interlocked input-output and credit markets. As household earnings are increasingly diversified by nonagricultural sources, land ownership remains important as a store of value but not, as it was in the past, as a primary means of survival. The continued importance of land as a store of value is evident in the continued struggle over this scarce resource, but the struggle has taken on different characteristics with different effects on productivity in each of the four villages under study.

Changes in land size and tenancy conditions have been linked to the productivity of the agriculture sector. For example, the intense labor input by smallholders results from their attempt to survive on their small landholdings and is not chosen voluntarily by them. Smallholders, who are mostly tenants, are compelled to produce a surplus equal to rent over and above an average income by the intensive use of labor, with a higher rate of exploitation. Furthermore, when disparities in wealth within the village are less significant, accumulation takes a more productive form as productive investments do not upset the balance of power in the village.

Fourth, as the leading social class consists of a variegated petite bourgeoisie, the exercise of state power by this class has had important consequences in Bangladesh. Political factions have driven primitive accumulation, but their short and unproductive life span has resulted in low levels of long-term investment in productivity. At the same time, rapidly opening up the market has had serious negative effects on many direct producers.

Fifth, primitive accumulation, intensive international migration, and the penetration of technology have contributed to shifts in agrarian structures. This, however, has not proved conducive to agricultural sustainability as depicted through the use of land, fertilizers, pesticides, and irrigation. Economic changes at the village level are closely bound up with individual household reproduction strategies, which are themselves shaped by locally specific factors, access to nonagricultural employment, and historically driven patterns of land distribution. The state's withdrawal from the agriculture sector as part of liberalization and deregulation policies has also affected the sustainability of this important sector.

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AGRARIAN TRANSITION AND FUTURE SUSTAINABILITY

INTRODUCTION

The Brundtland Report or *Our Common Future*, published in 1987, is still considered to be the foundation stone for sustainable development (United Nations, 1987). The report outlined many issues that risked the environment, putting future generations at a disadvantage. It also outlined strategies to recover from those very problems. Agriculture and food security were featured prominently in the report as the sector is at most risk globally. Sustainability in agriculture was questioned from both the consumption and production points of view. The never-ending desire to be more productive had caused great damage to the environment. While productivity is important to meet the food demand for an ever-growing population, the issues surrounding best practices are still being debated.

Agricultural production saw a major shift at the end of the last century when factors like mechanization, irrigation, fertilizers, and pesticides were introduced. This change is known as the Green Revolution, as demand for food rose sharply. The higher production resulted from the changes in the production system in countries that had been battered by constant famine and malnutrition in the 1960s. However, things took a turn for good when modern varieties were introduced, especially rice varieties. This raised the yield in agriculture that was crucial for food security. By the 1980s, Asian countries had become self-sufficient in food production even though the population doubled in the same period (Gomiero et al., 2011; Hazell & Wood, 2008). The value of agricultural production has tripled since 1970 (FAO, 2021). The demand for food will go up in the coming years as hunger and malnutrition still persist in many parts of the world. By 2050, world population is expected to reach 9.73 billion, and so the demand for food will increase by 50% from the 2012 level, with sub-Saharan Africa requiring the highest

amount of food (FAO, 2017b). Meeting this demand will depend on agricultural productivity and technological change.

One of the key contributors to agricultural productivity is crop productivity, which can be enhanced through the use of fertilizers and pesticides. The modern and hybrid varieties of crops responsible for growth relied on synthetic fertilizers. Farmers have also opted for intensive farming, producing crops on the same land two or three times a year, which resulted in significant degradation of soil quality. Intensive farming in most cases requires a mechanized irrigation system to ensure a flow of water. Some of the new variants require increased use of pesticides and insecticides. As a result, use of chemical substances in agriculture has increased drastically. In Asia, use of pesticides per hectare of cropland increased from 2.15 kg in 1990 to 3.68 kg in 2019 (FAO, 2021). In China, the use of pesticides more than doubled in 30 years. This shift in production methodology has led overall to an increased use of fossil fuel and chemicals in agriculture, both of which damage the environment and ecology severely. After the end of the Green Revolution, the philosophy of agricultural production has moved toward sustainable production.

Generally, sustainability in agriculture means the ways of practicing farming that maintain long-term viability of the agricultural enterprise through environmental protection and consumer safety. It also refers to a management strategy that helps farmers in selecting appropriate varieties of seed, conserving the soil, balancing sources of water for irrigation without destabilizing groundwater sources, using a fitting mix of fertilizers without hurting soil nutrients, limiting excessive use of pesticides, and so on, in line with these goals. The main aim of sustainable agriculture is, therefore, to minimize adverse impacts on the environment, ecology, and ecosystem while providing a sustained level of production and profit along with sound conservation of natural resources and biological diversity.

The twofold challenge for sustainability in agriculture is to provide more food from a small landmass to meet the growing food demands of a huge population at prices that are accessible for the poor, while at the same time minimizing the adverse impacts on the environment. This chapter is an inquiry into how sustainability in the agriculture sector is being hampered due to inappropriate use of agricultural inputs like land, fertilizers, pesticides, water, and so on for producing more food.

The existing process of accumulation has resulted in unsustainable agriculture because of market failures caused by asymmetries of power, diseconomies of scale, and unstable property rights, resulting in arrested productivity growth (Figure 6.1). The compulsion of maintaining subsistence forces peasants to resort to intensive production on smallholdings, a practice that continues to grow in developing countries. These problems are not addressed by market reforms even though agriculture is already largely liberalized, deregulated, and privatized in most countries.

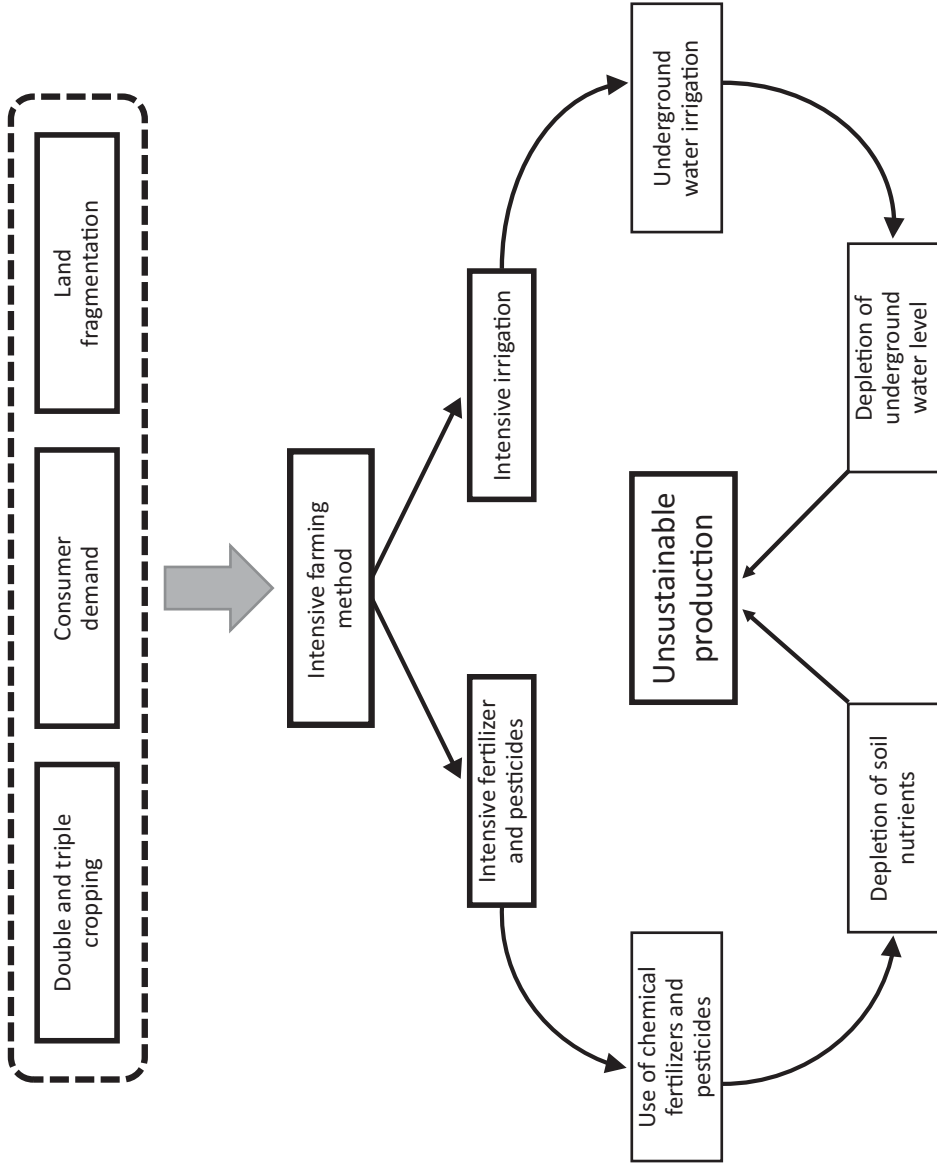


Figure 6.1 (Un)sustainable production.

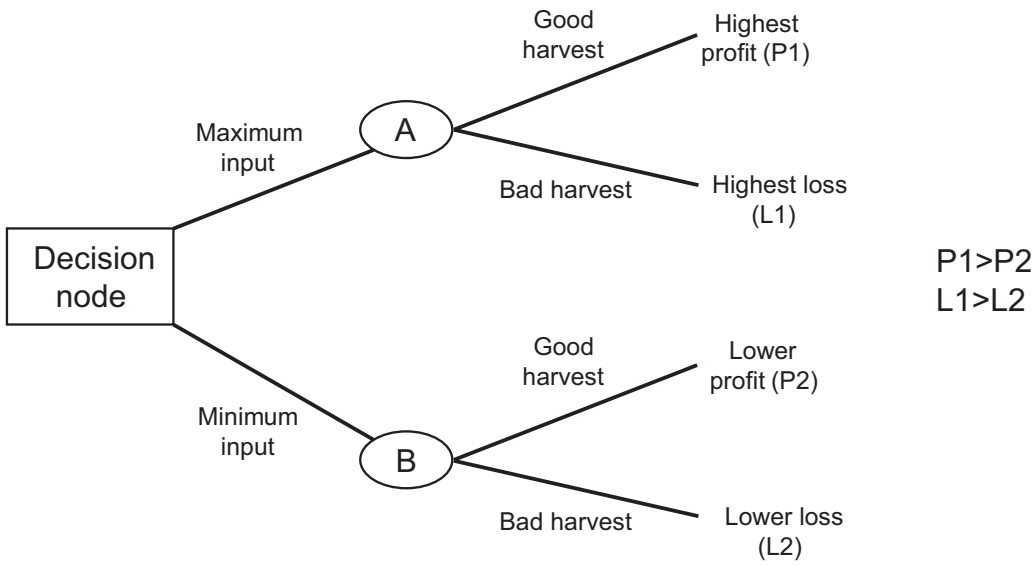


Figure 6.2 Decision tree for production.

Productivity is a function of compulsion. Compulsion implies peasant farmers have to maintain a certain level of production to live. Peasants are risk averse and hence resort to intensive farming. They opt for the highest amount of input in production (Figure 6.2).

When the size of the land is small, the farmer must spend more per unit of water, fertilizers, and seeds to increase productivity, which adversely impacts the return and the environment. Suppose that,

- C = cultivation cost
- W = water
- S = seeds
- F = fertilizer
- L_1 = water level
- F_1 = fertility of the land

$$\frac{dC}{dt} = \alpha W + \beta S + \gamma F \dots\dots\dots (6.1)$$

Here,

- α = cost of using water on the field
- β = cost of seeds
- γ = cost of fertilizer

In Equation (6.1), the more α, β, γ increase, the more the cost of production increases. With the increase in cost of production, the return for the farmer also decreases.

$$\frac{dL_1}{dt} = \frac{1}{\sigma} W \dots\dots\dots (6.2)$$

$$\frac{dF_1}{dt} = \frac{1}{\mu} S + \frac{1}{\varphi} S \dots\dots\dots (6.3)$$

σ = use of water

μ = use of seeds

φ = use of fertilizers

The excessive uses of irrigation, seeds, and fertilizers affect the environment and consequently production, which are shown in Equations (6.2) and (6.3). Equation (6.2) implies that when the water level is depleted. Equation (6.3) implies that the fertility of the land decreases with the increased use of fertilizer and hybrid seeds. Consequently, the environment is harmed as well, as the same land cannot produce similar outputs in future, resulting in declining growth in productivity.

Assume,

L = land

B = labor

C = capital

T = technology

P = amount of crop per acre

$$\frac{dP}{dt} = \alpha I \dots\dots\dots (6.4)$$

$$\frac{dI}{dt} = \beta L + \gamma B + \delta C + \mu T \dots\dots\dots (6.5)$$

Here,

α = rate of change of investment

β = rate of change of land

γ = rate of change of labor

δ = rate of change of capital

μ = rate of change of technology

Equation (6.4) demonstrates that the amount of crops per acre depends on the rate of investment. The rate of change in investment is contingent upon the rates of change in land, labor, technology, and capital.

Suppose that M = price of land. In reality, $M \propto t$ where t = time. Since the price of land increases over time, the landowner treats it as a saving and is not inclined to invest in other factors to augment productivity growth. As a result, β decreases and the vicious cycle continues. Equations (6.6), (6.7), and (6.8) depict that the registration, record, and possession of the land are determined by both power and money, as demonstrated earlier.

$$\frac{dD_1}{dt} = \alpha_1 M \times \alpha_2 P \dots\dots\dots (6.6)$$

$$\frac{dD_2}{dt} = \alpha_1 M \times \alpha_2 P \dots\dots\dots (6.7)$$

$$\frac{dD_3}{dt} = \alpha_1 M \times \alpha_2 P \dots\dots\dots (6.8)$$

where power = P , money = M , possession of land = D_1 , record = D_2 , and deed of registration = D_3

These equations demonstrate that the small and marginal farmers cannot possess enough land due to their incapacities in terms of money and power, and thus, they do not have adequate land to exert economies of scale. Since Bangladeshi agriculture is dominated by small and marginal farmers, the productivity in agriculture either declines or stagnates.

A market-oriented reform is generally assumed to entail liberalization, privatization, and regulation. It takes the following form:

$$M_R = f(L_1, P_1, R_1) \dots\dots\dots (6.9)$$

where L_1 = liberalization, P_1 = privatization, R_1 = regulation, and M_R = market reform

Assume further,

- A_1 = treating land as saving
- B_1 = transactions of land according to laws of market
- C_1 = land market free from political power

Then,

$$L_1 = f(L_1, P_1, R_1) \dots\dots\dots (6.10)$$

$$P_1 = f(L_1, P_1, R_1) \dots\dots\dots (6.11)$$

$$R_1 = f(L_1, P_1, R_1) \dots\dots\dots (6.12)$$

These are opposite to what the other equations suggest. Market reform is not possible unless the above issues are addressed.

Land

The importance of land as a factor of production has been assessed differently by different schools of thoughts at various times. The Physiocrats, for instance, assigned a dominant role to land as a basic input for the creation of economic welfare. In neoclassical tradition, land assumed a functional economic role as productivity and welfare differences between regions could be explained, *inter alia*, by different soil conditions (Giaoutzi & Nijkamp, 1994). More recently (and partly as a result of the emergence of “ecological economics”), land is regarded as having a productive and a consumptive value (Van den Bergh, 2000).

Originating from the importance of the productivity of land recognized by these different schools of thought, soil quality and management therefore becomes one of the main determinants of increasing land productivity over the course of production. Coupled with long-term threats to productivity from the unsustainable use of fertilizers and pesticides, sustainable agriculture becomes more and more concerned with proper soil management and diminution of land degradation, since land (or soil) is a basic factor input. The condition of the soil has both direct and indirect impacts on the quality and resilience of ecosystems impacting on biodiversity, not only locally but also globally (Douven, 1997). As a consequence of the externalities of soil pollution, soil management has become important.

Naturally, the most direct impact of the quality and management of soil is on cultivable, arable land, as unsustainable cropping and irrigation practices may deplete essential soil nutrients and thereby depreciate the productivity of land, in the absence of proper soil management. Net cultivable land in Bangladesh has been decreasing at an average rate of more than 60,000 hectares per year (from trend line analysis) during the 25-year period spanning 1980–1981 to 2004–2005. In 2004–2005, net cultivable land area was 8.44 million hectares compared to 9.38 million hectares in 1980–1981. That is, more than 90,000 hectares of agriculture land (11.11% of the net cultivable land area in 2004–2005) was lost during this period; this decline was particularly marked

during the period 1989–1990 to 1995–1996. Besides, net cultivable land was 65.64% of the total area of the country during 1980–1981, and it declined to 56.87 percent in 2004–2005 (BBS, 2018).

Due to monocropping, the levels of soil nutrients have been decreasing gradually. During 1971–2006, only one crop (rice) was cultivated in more than 80% of the total crop area of Bangladesh. As a result, the depletion rate of soil nutrients (for *Boro-T.*, *Aus-T.*, and *Aman* varieties) during this period was 333 kg per hectare per year (Table 6.1). If this rate of depletion of soil nutrients continues, crop production will be severely affected. Excessive use of fertilizers, pesticides, and irrigation sometimes helps increase crop yields, but it leads to soil pollution, health problems, destruction of natural habitats, high energy consumption, and unsustainable agricultural systems. The negative effects of soil degradation also increase production costs.

Land fragmentation is another problem for the agriculture sector in Bangladesh since yields depend considerably on the pattern, shape, and size of agricultural plots. Various land use patterns (e.g., dynamic land ownership) are causing additional problems. Single pieces of land are being divided into two and sometimes three parts, resulting in the loss of thousands of hectares of agricultural land every year. Land fragmentation makes mechanization difficult, particularly the use of power tillers and tractors, because of the shapes and sizes of the plots.

Cropping intensity has increased considerably in the last few decades. It was 153.74% in 1980 and increased to 176.91% in 2004–2005. The Department of Agriculture Extension (DAE) claims that the current cropping intensity is 195%, which indicates that it has increased more than 23% in 24 years (1980–1981 to 2004–2005). The Bangladesh Agriculture Research Institute (BARI, 2004) collates a 100% increase in cropping intensity of different agroecological zones, areas recognized on the basis of hydrology, physiography, soil types, tidal activity, cropping patterns, and seasons in Bangladesh, and found these areas increased in nine zones in two decades (1977–1978 to 1997–1998). There has been, on an average, a loss of 25% of soil fertility.

Chemicals

Fertilizer is a key input for increasing crop yields and a farm's profit. Chemical fertilizers are vital for crop production because they add four essential elements to the soil—nitrogen, phosphorus, zinc, and potassium. Over the years, use of chemical fertilizers like urea, potash, and phosphates has increased greatly. Two primary reasons that have contributed the most are the increased accessibility of the fertilizers and intensive farming. Fertilizers have become popular since the 1960s after the introduction of new crop varieties that required chemical fertilizers. Governments in developing countries went a step further by providing subsidies for fertilizers to make them affordable to farmers. The second reason for the increased use is the intensive nature of farming seen in

TABLE 6.1 Area under Crop Production from 1971–1972 to 2005–2006 (in thousand hectares)

YEAR/CROP	RICE	CASH CROPS	VEGETABLES	OILSEEDS	PULSES	SPICES AND		OTHER
						POTATO	CEREALS	
1971–1972	9,278.70	10.0	103.9	303.2	358.7	168.3	226.20	118.9
1974–1975	9,790.20	11.1	116.1	309.4	307.8	205.6	223.60	122.9
1979–1980	10,157.40	11.6	123.2	310.4	331.3	191.5	508.30	132.6
1984–1985	10,222.20	12.5	139.5	480.7	781.7	194.6	839.14	141.2
1989–1990	10,411.10	13.1	162.6	558.4	738.1	191.0	705.36	150.9
1994–1995	9,921.46	13.8	184.8	557.6	710.2	200.3	721.34	157.5
1999–2000	10,708.08	15.0	241.8	436.9	498.4	306.9	939.72	161.9
2005–2006	10,529.09	16.3	191.9	301.4	337.37	363.7	604.91	121.3

Source: BBS (2012).

Note: Rice = *Aus*, *Aman*, and *Boro*. Cash crops = jute, cotton, sugarcane, tobacco, and tea. Vegetables = brinjal, tomato, cauli, cabbage, radish, pusaik, chichinga, latas, bit, gajor, and shalgom. Oilseeds = mustard, til, linseed, groundnut, coconut, castor, sunflower, and verendah. Pulses = gram, mung, lentil, khesari, mashkalai, gharikolai, and orhar. Spices and potato = chili, onion, garlic, ginger, alach, turmeric, coriander, daruchini, labanga, and tejpara. Other cereals = wheat, maize, barley, joar, bazra, cheena, and kaon.

TABLE 6.2 Use of Chemical Fertilizers and Pesticides in Agriculture (1991–2019)

	FERTILIZERS (KG/HA)		PESTICIDES (KG/HA)	
	1991	2019	1991	2019
BANGLADESH	103.3	286.2	0.13	1.72
INDIA	74.8	171.1	0.42	0.36
CHINA	224.1	350.5	5.82	13.07
THAILAND	46.4	94.8	0.91	1.32
WORLD	90.5	122.0	1.53	2.69

Source: FAO (2021).

agriculture lately. With farmers producing more crops year-round, along with an increased use of fertilizers, soil quality has been on the decline as natural fertilizers cannot necessarily replete the lost nutrients in the soil. In Bangladesh, use of fertilizers tripled in 30 years (Table 6.2). The case is similar for pesticides; global use of pesticides has increased from 1.5 kg per hectare to 2.7 kg per hectare.

The application of chemical fertilizers increased sharply with the introduction of high yielding varieties (HYV). It was found that the required application rate of urea is significantly higher than that of other fertilizers, especially for the high yielding crop varieties. Before 1975–1986, farmers cultivated traditional varieties and used organic manure such as cow dung, bone meal, and so on, but, subsequently, more croplands were brought under irrigation and such traditional fertilizers were deemed inadequate since only HYVs, which require a higher fertilizer dose than traditional crops, are cultivated on irrigated land. The rate of fertilizer application was 0.36 kg/ha in 1975–1976, and it increased to more than 298 kg/ha in 2007 (Titumir & Basak, 2010).

The nature of the use is vividly visible in the villages studied. Two distinct features are present. First, intensity of production has increased manifold. Farmers in all the villages usually grow crops three times a year. Some lands even grow four crops a year, showing a high level of intensity. Second, the size of farmland has shrunk due to high land fragmentation driven by demographic pressures. As such, small farmlands are in a competition to raise their productivity levels using increased fertilizers and pesticides.

Analysis of data on rice yields for a 35-year period (1971–1972 to 2005–2006) reveals that production has been continuously increasing. In 1971–1972, the average rice yield was 1.05 metric tons per hectare, which increased to 2.52 metric tons per hectare in 2005–2006, a 240% percent rise. In 2008–2009, HYVs accounted for more than 72% of the total cultivated land area in Bangladesh (BBS, 2010).

The unsustainable nature of production has ramifications for the environment and ecology. The overuse of chemical fertilizers and pesticides has a detrimental impact on the environment through creating dead zones or hypoxic zones in bodies of water and

oceans. The chemicals end up in oceans through the bodies of water and create the hypoxic zones where oxygen concentration falls to 2 ml per liter. Such hypoxic zones result in mass mortality in the flora and fauna of that environment. Studies have found that the overuse created more than 400 hypoxic zones that affected a total area of more than 245,000 km² as early as 2008 (IPBES, 2019).

Globally, poor land management including using chemical fertilizers and pesticides causes a loss of 2.4 billion tonnes of soil. This massive degradation of land is expected to result in a decrease of crop yield by 10% by 2050. As a result, prices of food would rise by 50%, threatening food security (UNCCD, 2017). Land degradation has also resulted in one out of five hectares of land facing a decline in productivity (Rekacewicz, 2019). Replacing natural and organic fertilizers with chemical ones has also reduced the amount of carbon and nitrogen in the soil, disrupting the biotic activities of the soil, which eventually leads to degradation (Massah & Azadegan, 2016).

Based on the recommended fertilizer dosage and the average rice production data, the requirement (for rice production) of urea fertilizer will be 3.92 million tons, of triple super phosphate (TSP) 2.18 million tons, and of muriate of potash (MP) 1.71 million tons in 2050 (Basak, 2011). On the basis of trend line analysis of *Boro*, *T. Aman*, and *Aus* production and recommended dosages, 3.86 million tons of urea, 2.09 million tons of TSP, and 1.70 million tons of MP will be required by 2050. However, given the actual doses used at the field level, the total demand for urea, TSP, and MP fertilizer is likely to be 3.04 million tons, 0.70 million tons, and 0.55 million tons respectively, based on an estimation of data for average rice production. On the basis of trend line analysis of rice production, the requirement for urea will be 2.95 million tons, for TSP 0.69 million tons, and for MP 0.54 million tons in 2050, as per actual dosages. The application of such huge amounts of chemical fertilizers in the future may have a negative impact on soil fertility.

Farmers in developing countries usually have too little knowledge of the proper handling of pesticides, and as a result, they do not normally handle the products according to best agricultural practices. Since independence and over the years, pesticides have become a dominant feature of Bangladesh agriculture. To protect farmers' health and the environment, and to improve the sustainability of chemical pest control, a quantitative understanding of farmers' behavior in pesticide use is critical. However, in Bangladesh, pesticide application has increased manifold from 758 metric tons in 1960 and 3,028 metric tons in 1980 to over 19,000 metric tons in 2000 (Figure 6.3). The amount of pesticide applied in fields across the country rose to 48,690 metric tons in 2008. The use of toxic pesticides by Bangladeshi farmers increased by 328% during 1997–2008, posing a serious health hazard for humans and the environment due to long-term residual effects (BRRI, 2012). This rapid increase in consumption of pesticide raises alarm about its potential impact on farmers' health as well as on the environment, particularly pesticide poisoning, due to the widespread use of banned

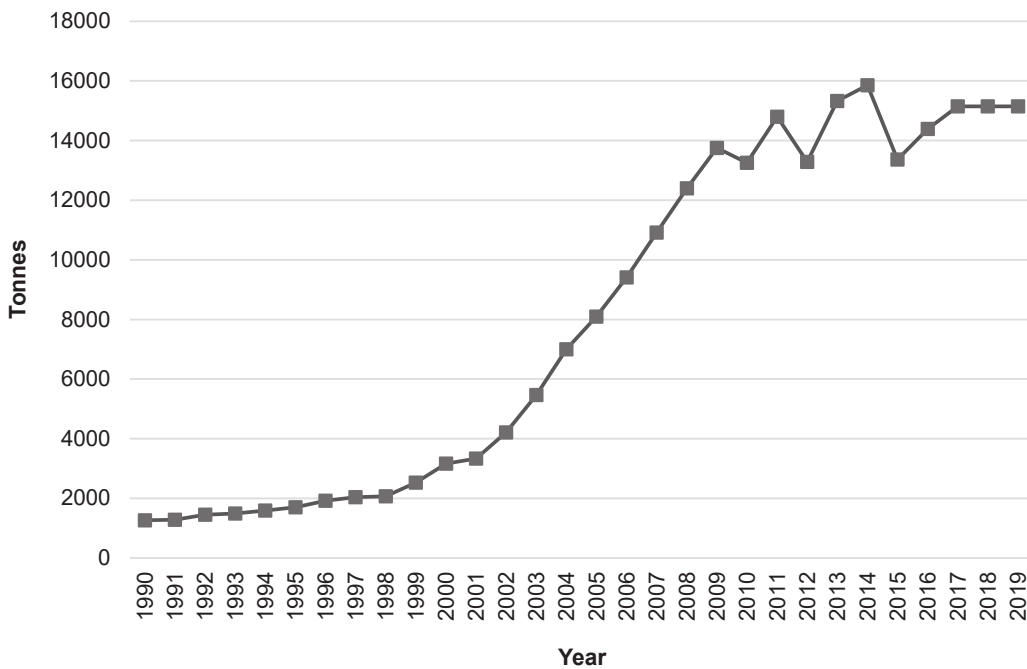


Figure 6.3 Pesticide application in Bangladesh (in tonnes). (Source: Based on FAO [2021].)

pesticides in Bangladesh (IRIN, 2010). These issues, however, have rarely been studied, particularly in the contexts of intensive cultivation and the preponderance of small-holder farms in Bangladesh.

Seeds

Nowadays, a major cause for concern is the use of hybrid seeds. The oligopolistic practices of the hybrid seed marketing companies and the imposition of restrictive conditions curtail the options of the small farmers, threatening their very existence. Moreover, the increased cost of inputs makes hybrid seed cultivation prohibitively expensive. Since the inclusion of agriculture in the trade liberalization agreements of the World Trade Organization (WTO), the multinational corporations have targeted the seed business as a thrust sector and, to consolidate their monopoly position, they are developing new varieties (such as hybrids), which prevents farmers from producing their own seeds. Introduction of such varieties also promotes the sale of agrochemicals, agro-equipment, and other highly expensive technologies from the multinational corporations. As a result, the farmers become fully dependent on the private sector for their crop production.

Due to the increased requirement of inputs for hybrid crop farming, soil fertility is declining, which is likely to affect the sustainability of this sector. Besides, higher global temperatures, declining water resources, and decreasing cultivable acreage are making the cultivation of input-intensive hybrid rice increasingly difficult.

Between 1981 and 2000, agricultural production in developing nations grew by 40% due to the use of improved varieties introduced during the Green Revolution (Evenson & Gollin, 2003). The introduction of hybrid seed, a product of biotechnology, had a significant influence on the industry (Bonny, 2014). Certain features may be generated using genetic material from other organisms, such as herbicide tolerance and resistance to pests and illnesses (Deconinck, 2020). Seed and biotechnology sales were valued at US\$52 billion in 2014 and were expected to rise to US\$70 billion by the year 2019. There was \$20 billion worth of maize seed and \$7 billion worth of soybean seed sales in 2014. There was an estimated \$17 billion in the North American market, which was led by maize (51%) and soybeans (26%) (Syngenta, 2016). The combined seed and biotech sales of Bayer, Monsanto, Dow, DuPont, Syngenta, and BASF were around \$22 billion in 2016, although estimates of the global market in 2016 varied from \$54 billion to \$69 billion (Bonny, 2017).

Fuglie et al. (2011) categorized seeds into three types based on availability: farm-saved seeds, seeds from public breeding companies, and seeds from commercial seed companies. OECD/FAO (2019) finds that the estimated rates of farm-saved seed vary from less than 10% of the total volume of seed used in North America to more than 60% in the developing regions of Asia and the Middle East and Africa. The organization also finds the share of farm-saved seed varies across regions and crops.

Irrigation and Groundwater

The Green Revolution has also led to a drastic change in irrigation and tillage in agriculture. Multicropping has led to higher extraction of both surface and groundwater at an alarming rate. Cropping during the dry seasons has put a strain on groundwater sources as the level of groundwater has been going down. Intensive farming has led to a significant decrease in the water level in European and Asian countries: 3,800 cubic kilometers of freshwater is extracted annually worldwide. Agricultural production contributes 70% of that total while industry and municipalities take 30% (Molden et al., 2007). Globally, nearly 70–80% of irrigation is done through groundwater, and as a result, the depletion of groundwater doubled between 1960 and 2000. Around 2 billion people rely on groundwater sources globally, and contamination of these sources has increased recently due to chemical runoff and increased use of chemical fertilizers and pesticides (Richey et al., 2015). By 2050, water consumption in agriculture will increase by 70% to 90%. At present, 7,130 cubic kilometers of water evaporate because of agricultural production. By 2050, the number will rise to 12,000 cubic kilometers to meet the demand for food. By the end of this century, the daily use of water will increase by 0.8 mm/day in Bangladesh due to climate change, while the rate of irrigation will be 8.8 mm/day in the year 2025 (Shahid, 2011).

Decline in the level of groundwater also affects the cost of production as pumping water from deeper levels requires more energy. Groundwater levels decline every year at the rate of 0.01 to 0.5 meters, particularly in the regions where *Boro* rice is cultivated. Excessive use of groundwater has caused a 32% decline in the 10 years between 2003 and 2013 (Khaki et al., 2018). *Boro* rice farming uses the highest consumption of groundwater, as it is grown during the winter period. This variety needs to be grown on waterlogged land. Hence, around 25–75 deep tube wells are planted per square kilometer—a process that originated in the 1960s. As the variety started gaining popularity among farmers, more and more tube wells were erected during the 1980s and 1990s, leading to higher extraction of groundwater (Timsina et al., 2018).

In the past half-century, the groundwater abstraction rate has tripled, as agricultural production saw a steep incline. The abstraction rate in most cases is higher than the recharge rate of the aquifer, which causes the water table to fall. Desertification in many parts of the world can be attributed to excessive groundwater extraction. As a result, a population that relies on groundwater for survival sees very little water. While many argue that using surface water can solve the problem, it is not always true. Globally, there is a trend of storing surface water through building dams and reservoirs. The stored water not only benefits agriculture, it also generates electricity from hydro-powered plants. Such reservoirs and dams have a detrimental impact on the environment as they change the biodiversity in the area.

Besides, excessive extraction of surface and groundwater has caused saline intrusion in coastal places. Increased water abstraction coupled with rising sea levels caused by global warming have resulted in higher salinization. Salinity in soil makes it unproductive as crops cannot grow in the presence of such high salinity. Economic losses due to land degradation from salinity amount to US\$27.3 billion in crop production. In Pakistan, around 13% of the irrigated land or 6.8 million hectares is estimated as being strongly saline, whereas in India, 5.26 million hectares of land are thought to have high salinity (Rekacewicz, 2019).

In Bangladesh, groundwater from shallow aquifers is one of the main sources of water for irrigation. In the last three decades, the number of shallow tube wells (STWs) and deep tube wells (DTWs) has increased dramatically. This allows farmers to grow additional crops during the dry season and ensures water security during drought periods. Of the four million hectares under irrigation, 2.4 million hectares are irrigated by approximately 900,000 STWs (FAO, 2006). However, groundwater contains different types of inorganic materials that are harmful to soil fertility. For instance, arsenic (As) in groundwater is a potential risk for crop production because of land degradation affecting agro-ecosystem services. From field surveys, it is seen that farmers use two to three times more irrigation water than needed, which affects soil nutrients and increases the cost of production. Furthermore, aerobic growth conditions in crop fields may reduce bioavailability and lead to uptake of arsenic in crops.

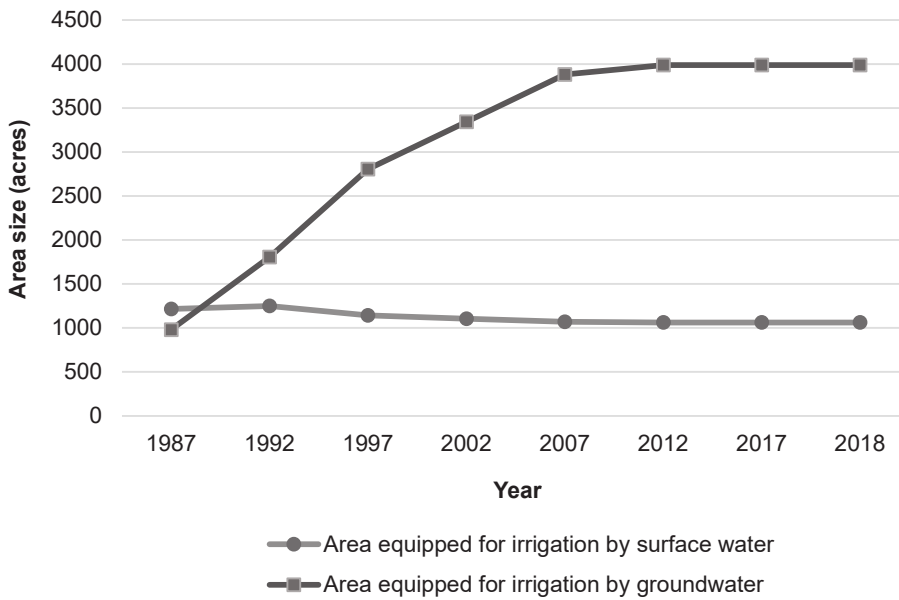


Figure 6.4 Area under irrigation by year. (Source: Based on FAO [2021].)

Various technologies have been used for irrigating croplands, contributing to a rapid expansion of irrigated land areas. The conventional irrigation methods (low lift pump, *dhone*, swing basket, treadle pump, etc.) have been replaced by modern ones (i.e., deep tube wells and shallow tube wells). Surface water irrigation has declined considerably due to the absence of new surface irrigation projects and the ineffectiveness of earlier ones (Rahman & Parvin, 2009). In 2011, more than 68% of the total irrigated area was serviced by groundwater, of which 83.4% was extracted by STWs and 16.6% by DTWs. In contrast, only 17.67% of the total irrigated area was serviced by groundwater in 1979–1980. The rapid expansion of groundwater irrigation by STWs was due to the government’s withdrawal of restrictions on the importing of tube wells by the private sector and the cost-effectiveness of imported machinery, which made it affordable to small and medium farmers (Figure 6.4).

Climate Change

In recent decades, agriculture has been subjected to increasing risks of climate change. Asian countries are at higher risk due to many being island countries that run the risk of inundation. Frequent disasters have plagued countries like Bangladesh, India, Sri Lanka, Indonesia, and Thailand in recent years. The climatic variabilities have led to growing crop losses and disasters like floods, cyclones, and droughts that have caused losses of billions of dollars.

The variable effect of climate change on different factors of production poses a threat to agricultural productivity (Table 6.3). The impact of climate change can be seen from

TABLE 6.3 Potential Impacts of Climate Change on Agriculture Production and Food Security

	IMPACT ON FOOD SYSTEM ASSETS	IMPACT ON FOOD SYSTEM ACTIVITIES	IMPACT ON FOOD SECURITY OUTCOMES	IMPACT ON OTHER HUMAN WELL-BEING OUTCOMES
A. CO ₂ FERTILIZATION EFFECTS	Production assets	Producing food	Food availability (production, distribution, exchange) Food accessibility (allocation, affordability, preference)	Livelihoods
B. INCREASE IN GLOBAL MEAN TEMPERATURES	Production assets Storage, transport, and marketing infrastructure	Producing food Storing and processing of food Consuming food	Food availability (production, distribution, exchange) Food accessibility (allocation, affordability, preference) Food utilization (nutritional value, social value, food safety) Food system stability	Livelihoods Social values and behaviors National and global economies
C.I. GRADUAL CHANGES IN PRECIPITATION (increase in the frequency, duration, and intensity of dry spells and droughts)	Production assets Food preparation assets	Producing food Storing and processing of food Distributing food Consuming food	Food availability (production, distribution, exchange) Food accessibility (allocation, affordability, preference) Food utilisation Food system stability	Livelihoods Social values and behaviors National and global economies

C.2. GRADUAL CHANGES IN PRECIPITATION (changes in timing, location, and amounts of rain and snowfall)	Production assets	Producing food Consuming food	Food availability (production, distribution, exchange) Food accessibility (allocation, affordability, preference) Food system stability	Livelihoods Social values and behaviors National and global economies
D. IMPACTS OF INCREASE IN THE FREQUENCY AND INTENSITY OF EXTREME WEATHER EVENTS (increase in annual occurrence of high winds, heavy rains, storm surges, flash floods, and rising water levels associated with tornadoes, tropical storms, and prolonged heavy rains)	Production assets Storage, transport, and marketing infrastructure Nonfarm livelihood assets Food preparation assets	Producing food Processing food Distributing food Consuming food	Food availability (production, distribution, exchange) Food accessibility (allocation, affordability, preference) Food utilization (nutritional value, social value, food safety)	Livelihoods Social values and behaviors National and global economies
E. IMPACTS OF GREATER WEATHER VARIABILITY	Production assets	Producing food	Food availability Food accessibility Food system stability	Livelihoods Social values and behaviors National and global economies

Source: FAO/IDWG (2008).

the frequency of natural calamities and disasters. The incidence of floods and cyclones has increased immensely in countries like Bangladesh, causing damage to crops. Some parts of the country have adopted unique varieties of crops that can grow on difficult farmland. In Bangladesh, the northeastern part of the country has a unique geography, as there are numerous swamps locally known as *haor*, which get flooded during the monsoon.

A rise in sea level affects agriculture in three ways: salinity intrusion, flooding, and increase in the frequency and intensity of cyclones. The combined effect of these three factors affects agricultural production in coastal zones. Salinity intrusion causes soil degradation and freshwater contamination, resulting in reduced agricultural production (MoEF, 2011). Salinity also decreases the terminative energy and germination rate of some plants (Ashraf et al., 2002; Rashid et al., 2004). For instance, it was found that the rice yield in a village in the Satkhira district in 2003 was 1,151 metric tons less than it was in 1985, corresponding to a loss of 69%. However, of this total decrease, 77% was due to the conversion of a portion of the rice field into a shrimp pond, and 23% was because of loss of yield on the remaining portion where rice was cultivated (Ali, 2006). Large-scale inundation, caused by rising sea levels, is likely to inflict severe damage on agricultural crops in future. The coastal areas of Bangladesh, totaling 49,000 sq. km (about one-third of the total area of the country), are influenced by the tides of the Bay of Bengal and thus vulnerable to inundation. A study by Butzengeiger and Horstmann (2004) found that if sea levels rise by 1 meter, normal flooding is expected to increase from its present level of 7.4 meters to 9.1 meters.

Floods also have had severe detrimental effects on crop production in Bangladesh. The 1988 flood caused a 45% reduction in overall agricultural production (Karim et al., 1996). A higher discharge and lower drainage capacity, in combination with increased backwater effects (as envisaged in most climate scenarios), would increase the frequency of such devastating floods (Table 6.4). Prolonged floods would tend to delay planting of *Aman* rice, resulting in significant loss of production, as observed during the 1988 floods. In recent years, loss of *Boro* rice from flash floods has become a regular phenomenon in the *haor* areas. Recent evidence (Unnayan Onneshan, 2012) shows that food intake in the flood-prone areas of Bangladesh is significantly below the national average for rural areas (Table 6.5). Considering all the direct and induced adverse effects of climate change on agriculture, one may conclude that crop agriculture would be even more vulnerable in Bangladesh in a warmer world (World Bank, 2000).

Cyclones cause huge damage to standing crops, the effect being particularly severe in coastal areas (Table 6.6). FAO/GIEWS Global Watch (2007) reported that when Cyclone Sidr struck, the main *Aman* crop, accounting for about 70% of the total annual rice production in the most affected area, was nearing harvest and the total yield loss was approximately 1.23 million tons, according to DAE (Department of Agricultural

TABLE 6.4 Comparison of Losses Resulting from Recent Major Floods

ITEM	1988	1998	2004	2007
Inundated area of Bangladesh (percentage)	60	68	38	42
People affected (millions)	45	31	36	14
Livestock killed (nos.)	172,000	26,564	8,318	40,700
Crops fully/partly damaged (million ha)	2.12	1.70	1.30	2.10
Rice production losses (million tons)	1.65	2.06	1.00	1.20
Total losses (in USD billions)	1.4	2.0	2.3	1.1

Source: World Bank (2007).

TABLE 6.5 Food Consumption Pattern (per capita in grams per day) in Flood-Affected Areas of Bangladesh

AVERAGE	CARBOHYDRATES (PER CAPITA IN GRAMS PER DAY)				PROTEIN (FISH, PULSES, MEAT, EGGS)		FAT (EDIBLE OIL)		VITAMINS (FRUITS AND VEGETABLES)	
	GAIBANDHA	SIRAJGONJ	GAIBANDHA	SIRAJGONJ	GAIBANDHA	SIRAJGONJ	GAIBANDHA	SIRAJGONJ	GAIBANDHA	SIRAJGONJ
Yearly average	412	419	33	28	9	10	200	133		
Average	408	411	31	20	8	8	192	122		
National rural average	426.55		62.66		14.20		241.39			

Source: Unnayan Onneshan (2012), BBS (2012).

TABLE 6.6 Comparison of Losses Resulting from Recent Large Cyclones

TROPICAL CYCLONE	DAMAGED ENTITIES	DAMAGES OCCURRED
November 12, 1970	Crops lost	Tk. 4.41 billion
	Loss of cattle	280,000
	Loss of poultry	500,000
May 26, 1985	Damage to crops	90,381 ha
	Livestock lost	135,033
	Trees destroyed	1,200
April 29, 1991	Damage to crops in acreage	133,272 (fully), 791,621 (partly)
	No. of domestic animal killed	1,061,028
	Total loss in terms of money	Tk. 145 billion
November 15, 2007 (Sidr)	Livestock killed	1,778,507
	Crops damaged (fully)	505,660 ha
	Crops damaged (partly)	1,177,086 ha
May 25, 2009 (Aila)	Crops damaged	77,486 acres (fully), 245,968 acres (partly)
	Livestock deaths	150,131

Source: BWDB (2009).

Extension) estimates: 535,707 tons in 4 severely affected districts, 555,997 tons in 9 badly affected districts, and 203,600 tons in 17 moderately affected districts.

In Bangladesh, the premonsoon and postmonsoon periods are most vulnerable to droughts (Table 6.7). There were around 20 occasions in the last 50 years when drought-like conditions prevailed in the country during these periods. The 1981 and 1982 droughts affected only the monsoon crops such as *T. Aman*. Drought conditions in northwestern Bangladesh in the 1990s led to a total production shortfall of 3.5 million tons. If the damage to other rice varieties (such as *rabi*, which is grown in winter), agricultural crops (like sugarcane, tobacco, wheat, etc.), and perennial agricultural resources (such as bamboo, betel nut, litchi, mango, jackfruit, bananas, etc.), are considered, this figure will be substantially higher.

Major country-wide droughts affect Bangladesh every five years, but local droughts occur more frequently, affecting crop life cycles. Agricultural drought, related to soil moisture deficiency, occurs at various stages of crop growth. Monsoon failure often causes yield reduction, resulting in famine in the affected regions. A better understanding of the monsoon cycle is thus needed to tackle this problem.

Northwestern regions are particularly vulnerable to droughts. A severe drought can cause more than 40% damage to broadcast *Aus*. Each year, during the *kharif* season,

TABLE 6.7 Chronology of Major Drought Events and Their Impact

YEAR	DETAILS
1791	Drought affected Jessore district; prices doubled or tripled.
1865	Drought preceded the Dhaka famine.
1866	Severe drought in Bogra; rice production of the district was hit hard, and prices tripled.
1872	Drought in Sundarbans; crops suffered greatly from deficient rainfall.
1874	Extremely low rainfall affected Bogra; great crop failure.
1951	Severe drought in Northwest Bangladesh substantially reduced rice production.
1973	Drought responsible for the 1974 famine in northern Bangladesh, one of the most severe of the century.
1975	Drought affected 47% of the country and more than half of the total population.
1978–1979	One of the most severe droughts in recent times with widespread damage to crops, reducing rice production by about 2 million tons, directly affecting about 42% of the cultivated land and 44% of the population.
1981	Severe drought adversely affected crop production.
1982	Drought caused a loss of rice production of about 53,000 tons while, in the same year, flood damaged about 36,000 tons.
1989	Drought dried up most of the rivers in Northwest Bangladesh with dust storms in several districts, including Naogaon, Nawabganj, Nilpahamari, and Thakurgaon.
1994–1995	The most persistent drought in recent times, it caused immense crop damage, especially to rice and jute, the main crops of Northwest Bangladesh, and to bamboo clumps, a main cash crop.
1995–1996	Impact on crop production.

Source: FAO (2007).

drought affects approximately 2.32 million hectares of cropland, causing significant damage to the *Aman* rice crop. In the *rabi* season, 1.2 million hectares face droughts of various magnitudes. Apart from yield loss, droughts have significant adverse effects on land fertility, livestock population, employment, and health. Very severe droughts hit the country in 1951, 1961, 1975, 1979, 1981, 1982, 1984, 1989, 1994, 1995 and 2000. Past droughts have typically affected about 47% of the country and 53% of the population (FAO, 2007). The associated decline in crop production, loss of assets, and lower employment opportunities contributed to increased household food insecurity. Food consumption fell, along with household ability to meet food needs on a sustainable basis. During droughts, vegetables and many other pulses tend to be in short supply.

The long-run estimates, based upon the trends in agricultural production from 1961 to 2007, suggest that if urgent actions are not undertaken to reverse the trend, more than 17% of the total population in South Asia may face food insecurity by 2050 and 35% of the population by 2100, due to shortage of staples (Titumir & Basak, 2010). The country-wise simulation exercises predict that Bangladesh and Nepal might face a significant level of food shortages, if the present trend of population growth continues. In 2050, more than 29 million people in Bangladesh and 15 million in Nepal will face rice shortages, which is equivalent to 10% and 25% of the population. Considering the population growth rate, food security in South Asia, if no immediate actions are taken, will be more vulnerable by the end of the current century. More than 199 million people, according to this study, may face shortages of rice in Bangladesh, which is more than 34% of the projected population in 2100. This will be more than 740 million (19.58%) for India, 549 million (43.71%) for Pakistan, and 73 million (53.50%) for Nepal. Wheat production will be more vulnerable compared to rice production if the present trend continues. The recent wheat production trend will not fulfill the future wheat demand for most of the South Asian countries except India and Nepal (Titumir & Basak, 2010).

The Way Ahead

Sustainable agricultural production means ensuring food security for the population without causing significant damage to the environment. In order to meet the demand, farmers have been using higher amounts of fertilizers and pesticides. Overextraction of groundwater has depleted the water level. At this point, there is a need for a paradigm shift in reducing environmental vulnerabilities from agricultural production methods.

One way to achieve sustainable agricultural production is to increase the efficiency of inputs like fertilizers and pesticides. The use of chemical fertilizers has increased over the years as multicropping led to depletion of natural resources in the soil. Natural fertilizers became obsolete. Efficiency can be raised through waste reduction on farms, as farmers do not have any specific ideas on what the optimum level of usage is, as seen from the villages studied. While there are general guidelines, types of soil differ and may require different levels of fertilizers. Using more than what is required can be counted as a waste of inputs.

Bioslurry is one of the best organic fertilizers to recharge soil nutrients since it is a rich source of both plant nutrients and organic matter. It increases the physical, chemical, and biological properties of soils, besides supplying essential nutrients to crop plants. It also increases the organic matter content of soils and maintains soil health. The use of bioslurry can reduce application of chemical fertilizers up to 50% (Islam, 2006). Reduced uses of chemical fertilizers will also benefit the peasant farmers in terms of costs of cultivation in a soil environment of high fertility and productive state

(Hossain, 1987). If this huge amount of organic fertilizers could be converted into bioslurry, a significant part of fertilizer demand could be fulfilled. If 7 million tons of organic fertilizer can be used in crop production, it could cover 5.3% of urea, 19% of TSP, and 34.13% of MP of the total demand for fertilizer (Basak et al., 2015).

Technological advancement is still in the early stages in developing countries. In recent times, the use of indigenous practices and machines has grown in developing countries. However, developed countries still hold the majority of the technological innovations. Most of the innovations in agriculture take place in developed countries, which if implemented in developing countries, do not result in the desired outcomes. Farmers in developing countries still rely on disembodied innovations, which stem from the indigenous knowledge of farmers (Sunding & Zilberman, 1999). Farmers have innovated new measures to cope with adverse environments. In Bangladesh, for example, farmers have been adopting innovative techniques in agricultural production. In areas affected by saline water, farmers have been growing seedlings in raised land to protect crops from salinity (Titumir et al., 2020). Nevertheless, innovation that also requires attention by developing countries at this time includes capital-intensive products like hybrid seeds, fertilizers, and pesticides that may raise productivity, keeping sustainability in check. Such innovation is, however, captured by the developed countries. The investment in agricultural R&D in developing countries requires a “big push.” Over time, official development assistance (ODA) to developing countries has shrunk significantly, even though the economies of these countries are still agriculture based. While the absolute value of ODA in agriculture increased in Africa and Asia, the share has decreased over time. Public investment is necessary in this sector not only to ensure sustainable production, but also to reduce poverty in rural areas.

A well-rounded approach to increase productivity, employment, and value addition in food and agriculture, primarily in developing countries, will have to facilitate access to productive resources, technology, and finance for smallholders; encourage greater diversification in production and markets; and work on building producer knowledge and productive capacities. The approach has to be coupled with restorative and protective policies for soil quality, biodiversity, and ecosystem health, and reduce waste in production and consumption. To top it off, the approach also has to be supported by enhanced climate and economic resilience of the community and livelihoods to strengthen adaptability to and recuperation from shocks to the ecosystem, and reforms in the institutional framework to redirect investment, finance, and innovation equitably toward building ecosystem health (FAO, 2018).

Sustainable agricultural practice is also therefore dependent on the political economy. Agricultural policies have been skewed toward large industrial farming, which may degrade the environment even more. Policies have favored the large farms more than the small farms. Large farms have benefited from credit programs, subsidies, and

trade policies. Policies have to be inclusive of small farms as the farm size in developing countries will only decrease. The reality is that agricultural production will become more intensified in the coming years to meet the growing food demand (Boyce, 2004). Hence, in order to ensure that the agricultural sector raises productivity, maintaining environmental sustainability requires strong policies that encourage innovation as well as provide necessary inputs. Moreover, increasing productivity requires new knowledge both to maintain yields and to improve the quality of production. This would imply substantial investments in agricultural research and outreach programs to disseminate technological know-how, and effective communication that improves farmers' access to market information. Certainly, improved technology may assist in more effective management in agricultural sectors, but it cannot produce an unlimited flow of those vital natural resources that are the raw materials for sustained agricultural production. Strategies for the future must be based first and foremost on the conservation and careful management of land, water, energy, and the biological resources needed for food production. In that situation cropping patterns must be selected on the basis of available natural resources.

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AGRARIAN TRANSITION, INSTITUTIONS, AND PRODUCTIVITY

INTRODUCTION

Agricultural production saw a major shift at the end of the last century when factors like mechanization, irrigation, fertilizers, and pesticides were introduced by the Green Revolution. Although the benefits brought about by the Green Revolution led to major breakthroughs, with countries aiming for food security, the bubble burst soon after, as productivity began to slow down in developing countries. The existing process of accumulation has resulted in unsustainable agriculture also because of market failures caused by asymmetries of power, diseconomies of scale, and unstable property rights, resulting in arrested productivity growth. Today, the twofold challenge for sustainability of agriculture is to provide more food from a landmass to meet the growing food demands of a population at prices that are accessible for the poor while at the same time minimizing the adverse impacts on the environment.

Mainstream theories are dominated primarily by neoclassical principles, which consider questions pertaining to efficiency and not so much the nature of agrarian transition. An effort is made to transcend the conventional approach to understanding productivity using agricultural inputs and factors of production. In doing so, the framework for understanding capitalist development in the agricultural sector has been discussed through two main approaches—the neoclassical theory that views an economy as being determined through market-based activities, and a Marxist political economy approach suggesting that economies are distinguished not only by their market and nonmarket characteristics, but in terms of their relations of production, which are the relationships of power between classes within a society. It sets the scene on dynamics of contemporary agrarian transition, starting from noting the shifts in land relations, productivity, and class relations, to present-day challenges to sustainability in agriculture. To that end, the discussion entails a combination of both ethnographic and empirical

approaches to analysis, presenting a comprehensive, well-balanced lens through which to perceive agrarian transition in developing countries.

It contests a number of theoretical positions on the relationship between market and nonmarket transactions and productivity growth in agriculture. First, it is demonstrated that the inverse relationship thesis that smallholders are more productive does not hold as their higher productivity is based on intensive self-exploitation and works within a narrow range. Second, although land fragmentation is increasing in the country, such increase is not the outcome of the greater productivity of smallholders, but because of demographic forces. Third, nonmarket forces are driving the agrarian transition in the country more than market forces. Fourth, the structure of political power has been acting as a constraint on both market and nonmarket land transactions to prevent a significant productivity transformation. Finally, the thesis argues that the existing process of accumulation has resulted in nonsustainable agriculture because of market failures caused by asymmetries of power, diseconomies of scale, and unstable property rights, resulting in arrested productivity growth.

SIZE–PRODUCTIVITY RELATIONSHIP

The inverse size–productivity hypothesis, which holds that smaller farms are more productive than larger ones, has to date remained the dominant view in policy circles. Originating from statistical observations and backed by neopopulist arguments, the thesis has been adopted by international organizations. If true, land fragmentation could be seen in a positive light with regard to productivity, as larger farms breaking up into smaller parcels would mean an overall increase in productivity. This investigation shows that smallholders may be more productive, but they produce at suboptimal levels with a ceiling on their level of productivity caused by scale diseconomies and high unit costs of production in terms of most factors. At the national level, the number of smallholders in the country has increased significantly, yet agricultural growth and productivity have not accelerated. The discrepancy between the operated areas held by land owners vis-à-vis tenants has increased over time in favor of the latter as well. In effect, smallholders are counteracting the effects of fragmentation by accessing land through tenurial relationships. People who are not direct producers have procured lands as a form of savings and leased out. This has a direct bearing on productivity. Since tenants have grown in numbers as their ownership of holdings decreased, it implies that the higher yields of smallholders are not enough for them to actually purchase land.

The explanation for this is that the productivity of smallholders actually results from desperation, rather than greater capitalist efficiency. Smallholders are compelled to produce more from small parcels of land because of their compulsion to survive in the

absence of any alternative livelihood options in rural areas. This observation, where it holds true, may be interpreted to suggest that smallholding peasant agriculture is actually inefficient. The high labor inputs of petty producers are an imposition, one not voluntarily chosen by them. Small producers, in most cases, who are by and large mostly tenants, are compelled to produce a surplus equal to rent over and above the average, achieved through the intensive use of labor with a higher rate of exploitation.

Second, land fragmentation is leading to suboptimal productivity growth despite relatively higher yields. Land fragmentation has adverse scale effects for smallholders. Problems like loss of crop yield, mechanization, irrigation, and reduced labor productivity arise due to land fragmentation. For example, when a large or medium plot is divided into three to four small plots, a significant quantity of productive land is lost.

Third, technology is assumed in the mainstream analysis to be scale-neutral. In reality, there are scale biases against smallholders even with very simple technology. Mechanization, particularly the use of power tillers, takes a toll due to lack of economies of scale of smallholders, also leading to suboptimal productivity growth. For example, an additional amount of fuel is required if the plot size is smaller. On average, hours of productive time are lost from a working day if the plot area is smaller. Effects of land fragmentation on irrigation are also found to be significant.

Fourth, dominant groups at the village level have little incentive to increase agricultural productivity through a revamping of the tenurial framework. Ending a system of sharecropping would not only have the effect of undercutting the landlords' ability to expropriate surplus production, but also undermine the reaping of profits in trade by exploiting the indebtedness perpetuated by sharecropping.

Fifth, the production process is further undermined by climate change and land degradation, linked again in a circular way to the issue of population size and associated land fragmentation. Since land is scarce in Bangladesh and the country is densely populated, too many people have to work on too little land. The precarious conditions created by these factors are magnified by the absence of adequate growth-promoting institutions, limited new technologies, and an unstable political settlement.

PRODUCTIVITY AND PRODUCTION INPUTS

Neoclassical economics predicts that once transaction costs are lowered, less productive farmers will sell their land (and will benefit from this sale) to more productive farmers, who will thus begin to dominate the market. As opposed to these perspectives, land fragmentation is increasing, not because of the greater productivity of smallholders but because of demographic forces. The increase in the number of households has a positive correlation with increasing land fragmentation. Population growth was the major

reason behind land fragmentation. Capitalist development has not yet wiped out the smallholders in Bangladesh, largely due to the nature of the process of differentiation, which has led to the eventual pauperization of the landless farmers, leading to a shift in land relations that is not accompanied by an increase in productivity.

The breaking up of landholdings as families expand and disperse is a much more powerful force behind land fragmentation than productivity differentials driving land transactions. Apart from division of land between siblings, land sales coincide with the rapid growth of young families. Early marriage is reportedly a driver and when families grow quickly, households are forced to sell to generate cash. Additionally, some fragmentation happens because many households suffer land loss due to river erosion.

Second, land fragmentation in terms of cropped land is also the result of increasing migration and remittances. In migrating households, women and aging parents sharecrop or mortgage out some of their owned land, thereby breaking it up into smaller operational units, and live on the proceeds from this arrangement, given that they also have remittances from members of their family. Even if they want to, they are unable to work the land without the help of the younger men who have gone abroad. Larger farmers tend to lease out or sharecrop their land and funnel investments into business or migration rather than reinvesting in the land.

Third, the cost of marriage—paying a dowry for daughters—also plays a role in loss of land and fragmentation. Families with young children are caught between not having enough family labor to work on the land and having too many young mouths to feed. This too results in land sales and poor peasants are forced to rely on their labor to sustain the family. Thus, nonagricultural variables are responsible for land transactions in declining households.

Fourth, fragmentation is a more powerful tendency than anything else and not so easily counteracted. Land concentration is not evident. Families could often trace back their lineage within the same locale for many generations. For the large landholders, fragmentation of land over time has been occurring at such a rapid pace that any concentration could not happen at a rate that could possibly match or negate the effect.

Since the Green Revolution, elements like fertilizers, pesticides, modern seed varieties, and irrigation have become key factors of production that have now gone on to significantly impact productivity. Farmers have now moved away from traditional fertilizers to chemical or synthetic ones as natural fertilizers have failed to cope with deteriorating soil quality. At the same time, hybrid seed varieties focusing on high yield have gained popularity and raised overall production. Countries are now in the race toward achieving self-sufficiency and food security, which has raised the intensity of cropping. Multicropping as well as hybrid modern crop varieties have allowed the countries to significantly increase yield. The use of fertilizer in farming has also caused a spatial inequality within countries. Access to fertilizers is not equal in all places. Inaccessibility

may arise from the price and supply of fertilizer. In one village, small farmers were reluctant to practice multicropping and use hybrid seeds due to the greater requirement for fertilizer. Hybrid crops require a higher amount of fertilizer, which often discourages small farmers who cannot afford such an amount. Besides, multicropping means farming during the dry season and that requires advanced irrigation methods. Lack of mechanization in irrigation limits the ability to grow crops year round.

MARKET AND NONMARKET DRIVERS OF AGRARIAN TRANSITION

The research engages with the debate on the market and nonmarket forces driving agrarian transition. Market-based accumulation refers to the transaction of land through formal and institutionalized contracting structures, whereas primitive accumulation is the nonmarket reallocation of land and is common in transition economies before capitalism has become dominant. The neoclassical perspective goes further to assume that land transactions are based on a “merit-based” system where the price offered reflects the ability to use land productively. Success in land acquisition therefore reflects industriousness. The so-called “market-based accumulation,” however, can take place in a very “primitive” fashion as well. Whether accumulation of land takes a “primitive” or “market based” form, the research demonstrates that it is not driving a rapid capitalist transition.

First, if markets are to drive productivity growth toward a capitalist transition, land has to be transferred to more productive land users. Productive peasants, however, do not have the capacity to buy land due to high land prices, which is a result of land purchases by people who often have incomes outside agriculture. Especially in the surveyed areas, the money for purchasing land usually comes either from remitting income from cities or abroad, or from industry or other activities. People who have access to income from outside agriculture are buying and renting, leasing and mortgaging land. They are not, however, engaging in such transactions to enhance productivity or because they have already achieved high productivity, but to invest in a store of value, which paradoxically can have negative effects on growth potential. Thus, market-based land transfers are not driven by productivity differences, as assumed in the neoclassical argument and in versions of the Leninist differentiation thesis.

Second, capitalism has not yet eliminated smallholders. Landlessness has been increasing, resulting in what can be termed “pauperization” as opposed to “polarization,” and smallholdings have actually become more dominant than in the past. Market transactions of land mainly involve the landowning class, and it is the small and marginal farmers who are mostly engaged in lease or mortgage relationships.

Third, the view that capitalist transitions occur through benevolent compulsions to enhance production is a fallacy that continues to drive neoclassical perspectives on what is required for a smooth transition to capitalist agriculture. Establishing ownership rights on land has become highly competitive due to its paucity. This intense competition over the accumulation of land manifests itself in nonmarket processes of primitive accumulation, which are not only fiercely competitive, but also result in violent insecurity for ordinary people in the form of threats, killing, ransom, and rape. This type of primitive accumulation operates through a nexus of entrepreneurs and political factions and their allies in the administrative, law enforcement, and judicial systems. A “merit-based” process of land transactions where success follows from productivity is far from the reality in Bangladesh.

Fourth, input-output markets for agricultural products are often interlocked and the source of insecurity for farmers as the sector has become much more dependent on the market supply of inputs over the years. For instance, when smallholders have to borrow money when harvests collapse or when competing demands are made on the household earnings, they are forced to borrow more in order to pay it back. Many farmers have to sell their crops before they are even harvested in order to get the money they need for inputs and household needs. If their crops fail, they can become landless. Most farmers cannot afford to preserve their rice till prices rise, since they need cash immediately at the end of the harvest in order to meet family expenses, debt repayments, and purchases of inputs for the next season. In addition, most families do not have homes large enough to store produce for longer periods of time. Thus, the markets are decisively imperfect and act against the assumptions of neoclassical economics. The operation of smallholders in these intermediary-manipulated markets leads to inequality, dispossession, and low productivity.

POWER, INSTITUTIONS, AND PRODUCTIVITY

Transfers of land are largely dominated by nonmarket processes in the form of primitive accumulation, as opposed to market-based accumulation. The configuration of power across competing political factions means that the agrarian transition is slow and sometimes even blocked. The different tenurial arrangements that have emerged and are upheld, or which shift according to changes in socioeconomic structures, represent the complexities in the agrarian transition. In the study, in certain villages it appears that sharecropping systems of the rent-in-kind nature have not only persisted but have been augmented. In other villages, forms of mortgaging agreements have emerged and rapidly expanded to meet changing needs and demands. A number of characteristics of

these processes are relevant. First, people are powerful in rural areas because of their family and/or social networks and sometimes because they are rich in land. While land is an important source of power, political networks and collusion with or membership in ruling political factions are also equally important.

Second, financial power can originate outside the agricultural sector in sources such as remittances and nonagricultural businesses as well as through political accumulation in the past. Politically involved landowners are likely to experience a fall or a rise in their landholdings reflecting the shifts in the distribution of power across factions. The cycling of land through primitive accumulation across different factions makes it different from the prototypical capitalist model of agricultural transition based on primitive accumulation where land concentration can rapidly take place. Third, the structure of patron-client networks, differences in initial conditions of land productivity, and technological opportunities jointly explain why primitive accumulation takes specific forms in different parts.

Fourth, the so-called market-enhancing reforms adopted at the behest of international financial institutions and “development partners” have proved unhelpful to direct producers. The weak position and feeble bargaining capacity of the ruling elite vis-à-vis their international partners have not allowed independent and pragmatic policymaking. In a liberalized market, for example, the bargaining power of poor farmers has deteriorated with damaging effects on poverty reduction.

DIFFERENTIATION AND TRANSITION

Bangladesh, like many developing countries, is not experiencing a classical agrarian transition. The continuance of fragmentation of plots due to demographic changes increases the number of smallholders while the agrarian system continues to remain skewed against the poor cultivators, and both processes increase landlessness, with laborers in distress.

It seems that Bangladeshi agriculture has neither been able to provide a surplus to the nonagriculture sector—rather, a majority of the transactions in agriculture are financed by nonagricultural sources including remittances—nor has it been adept in generating a major rural market for industrial produce. The village studies, nevertheless, demonstrate that surplus value created in agriculture feeds into the accumulation of traders-cum-moneylenders through interlocked markets, and agro-industries and multinational companies providing inputs and machines such as seed, water, fertilizer, and pesticides.

The number of smallholders is increasing, and the range of farm sizes is actually quite narrow. Even “large” farms are in fact quite small in absolute terms. There has been falling profitability of agricultural production. The large farmers are engaged

in rent extraction while the peasantry is being pauperized, and the majority of transactions are financed by nonagricultural incomes, including remittances from family members living outside the village, as the surplus is not enough to finance such transactions. Small farmers exhibit the greatest tenacity in holding on to their last pieces of land. The hiring of labor by small farmers does not make them “capitalist” since even petty commodity producers need to employ labor during peak periods. The employers of labor are too numerous for large landlords to attempt to play a monopsonic role in the labor market in Bangladesh and countries like it.

The increase in landlessness points out that the absorption in the formal labor market has contracted while most of the absorption is in the informal sector, with agriculture still remaining the largest employer. Analysis of the wage structure demonstrates the distress of the laboring classes.

State support in the form of public expenditure in agriculture has witnessed a downward trend, particularly after the neoliberal reforms. For example, the poor cultivators have limited access to institutional credit and ownership of technological devices.

The agrarian development and agrarian transition should be understood in relation to the wider (nonagrarian) economic developments in society, as political settlement and primitive accumulation permit (inhibit) property rights being reallocated in growth-enhancing directions.

SUSTAINABILITY AND HUMAN SOCIALITY

Agricultural production experienced a major shift at the end of the last century when factors like mechanization, irrigation, fertilizers, and pesticides were introduced. Sustainability in agriculture means the ways of practicing farming that maintain the long-term viability of the agricultural enterprise through environmental protection and consumer safety. It is a management strategy that allows farmers to select the appropriate varieties of seed, conserve soil, balance sources of water for irrigation without destabilizing groundwater, use a fitting mix of fertilizer without hurting soil nutrients, practice nonexcessive use of pesticides, and so on in line with these goals. Sustainable agriculture largely contributes to minimizing adverse impacts on the environment, ecology, and ecosystem, and at the same time provides a sustained level of production and conservation of natural resources and biodiversity.

The main challenges for sustainability in agriculture originate from the need to produce more food from a rapidly fragmenting landmass in order to meet the exponentially increasing demand for food due to the population size. At the same time, the prices have to be affordable to all income groups in the population, while ensuring that lower prices are not achieved at the expense of adversely affecting the environment. In

order to overcome these challenges to ensure sustainability in agriculture, it is imperative to emphasize the practice of human sociality in production and consumption. Developing a human–nature reversible relationship will constitute perceiving nature as the melting pot for humans and other living beings existing in cohabitation, coexistence, and co-dependence. The human–nature relationship goes beyond perceiving nature only as an asset and will therefore govern decisions of production and consumption that lead to a balanced coexistence and sustainability. In Bangladesh, while the riverine land has experienced great fertility, the country has seen the rage of nature as well in the form of disasters. The issue of living in harmony with nature, however, has always been neglected in the country’s development. Human beings consider nature as the supplier of mere commodities that provide monetary value, which therefore leads to overextraction of natural resources as well as little concern for nature’s well-being. The relationship between nature and humans has become lopsided as more natural resources are being extracted without pondering on the consequences. Restoring natural resources can be done through strengthening both formal and informal institutions and streamlining the flow of productive resources, technology, and innovation through these institutions. The strength of formal and informal institutions can further allow greater economic and climate resilience of the community, which will generate stronger adaptability and the ability to cope with shocks, as part of developing human sociality with the forces of nature.

ABBREVIATIONS

ADP	Annual Development Program
AEZs	Agro-ecological zones
As	Arsenic
BADC	Bangladesh Agricultural Development Corporation
BAL	Bangladesh Awami League
BARC	Bangladesh Agricultural Research Council
BARD	Bangladesh Academy for Rural Development
BARI	Bangladesh Agricultural Research Institute
BAU	Bangladesh Agriculture University
BB	Bangladesh Bank
BBS	Bangladesh Bureau of Statistics
BDHS	Bangladesh Demographic and Health Survey
BIDS	Bangladesh Institute of Development Study
BMI	Body mass index
BNP	Bangladesh Nationalist Party
BRAC	Bangladesh Rural Advancement Committee
BRII	Bangladesh Rice Research Institute
BWDB	Bangladesh Water Development Board
CBN	Cost of basic needs
DAE	Directorate of Agriculture Extension
DAP	Diammonium phosphate
DCI	Direct calorie intake
DSE	Dhaka Stock Exchange
DSSAT	Decision support system for agrotechnology transfer
DTWs	Deep tube wells
FAO	Food and Agriculture Organization
FY	Fiscal year
GDP	Gross domestic product
GIEWS	Global Information and Early Warning System on Food and Agriculture
GKI	Griffin, Khan, and Ickowitz
GoB	Government of Bangladesh
HDI	Human Development Index
HIES	Household Income and Expenditure Survey

HPL	High productivity land
HYV	High yield varieties
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
ILO	International Labor Organization
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IRDP	Integrated Rural Development Program
IRRI	International Rice Research Institute
K	Potassium
LDC	Least developed country
LFS	Labor Force Survey
LHPG	Large high productive growing
MDG	Millennium development goal
MFI	Microfinance institutions
MHPG	Medium high productive growing
MLPS	Medium low productive stable
MNC	Multinational corporation
MoA	Ministry of Agriculture
MoF	Ministry of Finance
MoEF	Ministry of Environment and Forest
MOP	Muriate of potash
MSLP	Medium stable low productive
MSV	Modern seed varieties
N	Nitrogen
NCNPs	Neoclassical neopopulists
NGO	Nongovernmental organization
NFPCSP	National Food Policy Capacity Strengthening Program
NIE	New institutional economics
OAS	Organization of American States
ODA	Official development assistance
P	Phosphorus
PPP	Purchasing power parity
PRSP	Poverty Reduction Strategy Papers
R&D	Research and development
RWP	Rural Works Program
SAP	Structural Adjustment Program
SHPD	Small high productive decline
SLPD	Small large productive decline

SLPG	Small large productive growing
SLPS	Small large productive stable
SLLP	Small stable large productive
STW _s	Shallow tube wells
TMSS	Thengamara Mohila Sabuj Sangha
TSP	Triple super phosphate
UN	United Nations
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
UP	Union Parishad
US\$	United States dollar
USAID	United States Agency for International Development
WB	World Bank
WCED	World Commission on Environment and Development
WTO	World Trade Organization
ZnSO ₄	Zinc sulphate

GLOSSARY OF BENGALI WORDS

Ail *Ail* is a boundary made up of soil to demarcate a plot.

Beel and baor A *beel* or *bheel* is a pond (wetland) with static water. The difference between a *haor*, a *beel*, and a *baor* is usually very small.

Bigha A *bigha* is a traditional unit of land. One *bigha* is equivalent to 20 *kathas*, each worth 1,361 sq. ft (126.44 m²).

Boro paddy *Boro* paddy is commonly known as winter rice; cultivated from November to May under irrigated conditions.

Char The riverine sand and silt landmasses are known as *char* in Bengali. These areas are highly vulnerable to sudden and forceful flooding as well as erosion and loss of land.

Chatal Local husking millers are called *chatal*s.

Dalal Mediator or third party.

Debottor *Debottor* property is an endowment or property given to trustees and/or a deity as receiver in accordance with the Hindu religion.

Gher Shrimp farms in the southwest region are called *ghers*.

Gonda A traditional land unit; 20 *gondas* are equal to 1 *kani* and 1 *kani* is equal to 120 decimals.

Haat or bazaar A place where people assemble daily or on particular days in a week primarily for the purposes of buying or selling goods.

Haor A *haor* is a wetland ecosystem that is physically shaped like a bowl or saucer.

Jalmahal A form of demarcated wetland.

Jotdar *Jotdars* are big landowners who have their own henchmen called *lathials*.

Kharif Crops grown from April to November.

Khas land Government-owned land.

Khatian A *khatian* is a land record certificate.

Mahajan Local moneylenders.

Mastan Local bullies who generally have a godfather.

Matbar Powerful head/s of a village having sizable landholdings.

Maund A unit of weight; 1 *maund* is equivalent to 37.3242 kilograms.

Pakhi Traditional measurement of land, which varies in different areas of Bangladesh.

Rabi Crops grown in one of the two agricultural seasons, namely starting from November and extending to the end of March.

Rajshail Local variety of paddy grown during the dry season.

T. Aman A variety of paddy, harvested in the months of November and December. Some varieties of *Aman* are sown in the spring using the broadcast method. These mature during the summer rains and are harvested in the fall.

T. Aus A type of paddy sown in March or April. It benefits from April and May rains, matures during the summer rain, and is harvested in the summer.

Tehsildar A *tehsildar* is a land revenue official in charge of collecting land taxes.

UP (Union Parishad) Local government body in Bangladesh.

Waqf Donation of a building, plot of land, or cash for Muslim religious or charitable purposes.

Zamindar Landed aristocrats with enormous tracts of land, having control over peasants from whom *zamindars* reserved the right to collect tax.

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