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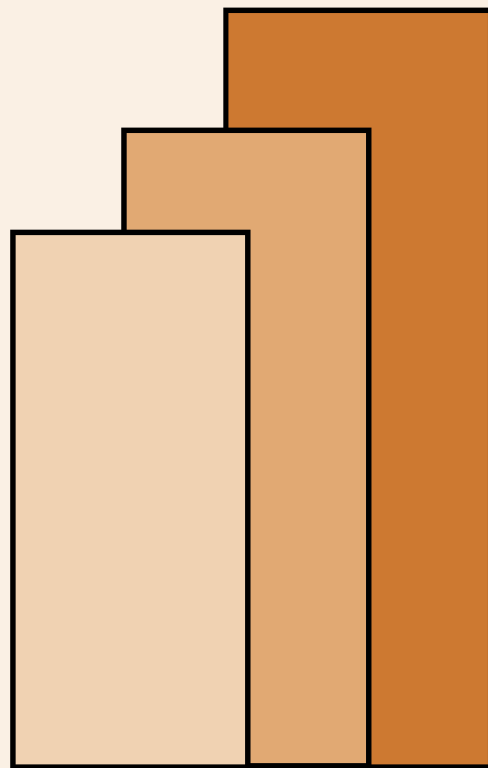
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**PROPERTY RIGHTS REFORM IN PHILIPPINE AGRICULTURE:
FRAMEWORK FOR ANALYSIS AND REVIEW OF RECENT
EXPERIENCE¹**

Roehlano M. Briones^{}**

May 31, 2000
(Not for quotation)

Abstract

This paper constructs a framework for and reviews studies on property rights reforms in the agricultural and natural resources sector. In the case of agrarian reform, several hypotheses are posited: that agrarian reform will increase the rate of capital accumulation of beneficiaries and improve tenurial security, but may have negative impacts on land access, investments of landowners, and efficiency of land use. For the natural resources sector, the implications of open access and promotion of property rights are surveyed for the Philippine case. Overall, the review finds that research work is scanty and not clearly generalizable to the national level, even for such a major and longstanding program as agrarian reform. Future research thrusts are enumerated in terms of the issues and hypotheses identified in this review.

¹ This paper is prepared for the Philippine Institute for Development Studies under Project No. BAR/00-99/10 entitled "Economic Methodology for the Prioritization and Allocation of National Research, Development and Extension Programs for Corn and Other Major Commodities: Objectives, Research Activities, and Budget- Agrarian Reform Issues."

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1. INTRODUCTION

In traditional and modern economies, an essential element of the resource allocation mechanism is the property rights system. Flaws in the underlying property rights system may lead to misallocation of resources. The related problems of mass poverty, sluggish growth, and rapid resource depletion in many developing countries suggest a wide scope for property rights reforms. The Philippines exemplifies these problems: the official poverty headcount in 1997 was 37.5%, with a far larger magnitude (51.2 %) in rural areas where land ownership inequality is the norm. Deforestation and overfishing remain critical: 1991 to 1996, the average annual rate of 1.52%, leaving behind a forest cover of 5.54 million ha., down from 10.8 million ha. just three decades before 1968. Meanwhile, municipal fisheries have experienced an average annual output decline of 2.8% in the 1990s. The agriculture and natural resource sectors have therefore been the subject of extensive property rights reforms.

The Comprehensive Agrarian Reform Program (CARP) begun in 1988 to implement RA 6657 (the Comprehensive Agrarian Reform Law, or CARL) is the culmination of several decades of land reform efforts. These efforts include the land reform code (RA 3844) of the 1960s, which prohibited share tenancy, and the 1972 Presidential Decree No. 27 which covers rice and corn lands. Meanwhile policies on property rights in the uplands and coastal areas have been implemented to arrest resource degradation, including the introduction of tenure instruments and the recognition of common property arrangements.

In the past decade, studies on these initiatives have burgeoned. This paper reviews these studies under an analytical framework for property rights reform. Our framework

identifies *efficiency* and *equity* as the criteria for evaluation. Interpreted broadly enough to include intergenerational welfare, these criteria subsume the issue of *sustainability*. Economic analysis typically focuses on efficiency, for which its analytical tools are well suited. The equity criterion, while important, involves a nearly intractable web of social justice issues. Our review finds that an exclusive application of the efficiency criterion is a fruitful and workable simplification for the evaluation of property rights reform. Equity nevertheless remains integral to the discussion; as we shall see, recent theory hypothesizes a close link between efficiency and equity.

Evaluation of efficiency involves a comparison of benefits and costs. The challenge facing an efficiency analysis is identifying and valuing the benefits and costs of reform. These tasks will be the main thrust of the analytical framework and the review of recent experience. Given the immensity of the relevant literature, our paper devotes the most attention to the CARP, which is the premier property rights reform program.

We present in the next section the framework for analysis of land rights. The review of the CARP follows in Section 3. We discuss the natural resource sector in Section 4. Section 5 concludes.

2. ANALYTICAL FRAMEWORK FOR LAND RIGHTS

2.1. Property rights systems

Property rights determine how persons may or may not behave in relation to one another, with respect to the use of resources. The establishment of a system assigning property rights confers obvious benefits to society as a whole. First, in the absence of such a system, a destructive “state of nature” may prevail, in which individuals and

groups engage in conflict to appropriate one another's resource possessions. Second, the property rights system enables a mechanism of rewards and penalties to operate, motivating persons to employ resources towards productive ends.

On the other hand, property rights systems also impose costs. At the very least, there are transaction costs in setting up and maintaining the system – for example, resources are expended in demarcating and defending boundaries, and establishing an enforcement mechanism to settle conflicts and adjudicate disputes.

Private property

The most familiar property rights system that of *private property*. In this system, property is defined in terms of *residual rights*,¹ which permit the right holders to take actions not otherwise prohibited within the system. Discretionary use, within explicit restrictions, is the most natural way of understanding the term “right”. An obvious example is the ownership of livestock with prohibitions on cruel treatment. In addition to assigning residual rights, the system allows the transfer of these rights. Transferability is a critical feature of the private property system, as this permits the formation of markets, which are simply institutions for the orderly exchange of rights.

The **evolutionary theory** of property rights employs an economic framework to explain the emergence of private land rights (Fields, 1989; Platteau, 1996). The classic statement of the theory is due to Demsetz (1967): “Property rights develop to internalize externalities when the gains of internalization become larger than the costs of internalization. Increased internalization, in the main, results from changes in economic values (p.350).” He cites as an example the development of land rights for Labrador

Peninsula Indians: with increased fur trading came the formation of a property system in forestland.

The evolutionary theory also appears in Boserup (1965). She identifies population pressure with technological change leading to settled agriculture as factors that lead to a growing precision in defining private property rights. A more recent illustration of the theory is the case of Thailand, where the opening of the Kingdom to international trade in the 1800s increased demand for rice land, thus ushering in a formal land registry system (Feeny, 1982, as cited in Deininger and Feder, 1998.)

Evidence regarding the effect of land rights establishment on investment is mounting (Deininger and Feder, 1998). In China the shift from collective farming to individual land rights raised agricultural productivity (Lin, 1992). Case studies of communal forestland show that the establishment of individual land rights motivated agroforestry investment (Otsuka, 1998). Active participation of farmers in Cameroon in land titling programs is additional confirmation of the incentive effects of land rights (Firmin-Sellers and Sellers, 1999).

2.2. Agricultural land under a private property system: Allocation and welfare

In the following we assess the welfare implications of the operation of a land market, after clarifying the criteria to be used in assessing social welfare.

Evaluation criteria

A widely used (and innocuous) standard for evaluating alternative allocations is the *Pareto criterion*. The criterion states that a reallocation makes society better off if it harms no one, but improves the well being of someone. Social welfare is maximized if no

further Pareto improvements are possible, in which case the allocation is characterized as *Pareto optimal*. This implies that the allocations that maximize welfare may not be unique; rather, there may be a range of optima, corresponding to a range of possible *initial* allocations of individual well being.

A more useful but far more controversial standard is the criterion of *potential Pareto improvement*. According to this standard, reallocations that harm some persons makes society better off, if there is a compensation scheme financed by beneficiaries such that nobody ends up being worse off. As with the Pareto criterion, optimality is defined as exhausting all such improvements, and a range of welfare optima exist consistent with alternative initial distributions.

The controversy surrounding this criterion is due to the purely hypothetical nature of the compensation. Payment is seldom made given the costs of actually setting up a compensation scheme. Despite this difficulty, the standard is widely used in normative analysis and is employed in this paper.

Land use under perfect markets

Here we can clarify more precisely the benefits that arise from the private property and exchange system. We examine first the benchmark case of *perfect markets*. As defined in neoclassical theory, this case refers to an idealized state where transaction costs and externalities are absent, agents behave competitively, entry and exit choices are unconstrained, and information is equally distributed across economic agents.

Two major propositions may be stated for this case:² First, *market equilibrium is optimal*. Optimality of land use may be understood in both a static and dynamic sense. From a static viewpoint, payment for land services would be the same for all transactions

at equilibrium, and would equal the marginal product value in all uses. Hence no reallocation of land can increase aggregate output. Other factors are priced and employed in the same way. From a dynamic viewpoint, landowners will make optimal choices on land improvement (or preservation of land value), as they undertake land investments until the point where the rate of return equals the opportunity cost of capital. Moreover, the price of the land capitalizes the present value of its income stream.

Second, *any optimal allocation corresponds to some market equilibrium*. That is, the attainment of a Pareto optimum does not depend on the distribution of property rights. The implication is that a preferred outcome, based on a more restrictive welfare criterion (e.g. one that emphasizes equity), may be reproduced as a market equilibrium starting from some appropriate endowment. To reach this appropriate endowment, some authority may have to undertake redistribution, aimed at endowment values or individual assets as a whole; land commands no special attention as a store of wealth.

The caveat is that redistribution must be costless. Of course, this is rarely true; at the very least, those harmed by redistribution may expend resources to oppose the move. In general, they may make choices that would be otherwise be unprofitable in the absence of intervention. Hence, the intervention can introduce *distortions*. For example, a tax-transfer system may reduce labor supply of both contributors and recipients. Because of these costs, a move to a greater equity may face the *efficiency-equity tradeoff*.

Land use in the real world

In reality, markets, particularly in agriculture, are far from perfect. Transaction costs abound, the mechanism for contract enforcement operates badly, information is asymmetric, competition is imperfect, and some markets may be absent. Agriculture is

moreover subject to seasonal fluctuations and random shocks that exacerbate these problems.

In the presence of such market failures, the foregoing propositions are no longer valid. Market equilibrium need not be efficient, and the attainment of a Pareto optimum may depend on the initial endowment. The inapplicability of the second proposition permits a new approach towards the analysis of efficiency and equity. Instead of the social planner facing an efficiency-equity tradeoff, the simultaneous improvement of efficiency and equity may be possible. The theoretical explanations for the equity-efficiency link in land distribution may be categorized under the following headings: *imperfections in related markets*, *agency relations*, and *localized linkages*. We examine these arguments in the following.

2.3. The efficiency-equity link: Imperfections in related markets

Failures in the operation of land markets may arise from imperfections in related markets, particularly the insurance and credit markets. Credit constraints are the most commonly-cited and convincing argument for the inefficiency of skewed land ownership (Deininger and Squire, 1998; Aghion, Caroli, and Peñalosa, 1999). The credit problem is the consequence of asymmetric information and weak contract enforcement.

An investment project always involves risks, which may be exogenous to the credit market, e.g. pest infestation, or steep price declines. Inadequate project returns are also related to the behavior of the borrower, who may decide to default, take excessive risks, or fail to exert the effort needed to ensure a profitable return. Such behavior may be seen as the result of inherent individual characteristics, i.e. "reliability". The "reliable" and "unreliable" types have a known distribution in the population, though information

on the type of a particular borrower is not known to the lender. When the interest rate is a signal of the type of borrower, credit may be rationed in equilibrium (Stiglitz and Weiss, 1981). The problem of price being related quality (i.e. interest rate on a loan with the reliability of repayment) is referred to as *adverse selection*. On the other hand, default or proneness to default may result from the borrower's choice, which cannot be distinguished from project failure arising from external causes. Information regarding the choice taken is asymmetric. This problem is referred to as *moral hazard*.

Market adjustments to these problems are evident in the agricultural sector. Credit constraints artificially raise factor supply for activities that generate immediate cash flows; for example, farm households allocate labor supply away from own-farm labor to off-farm labor, leaving part of their cultivated area idle (Alwang and Siegel, 1999). In the formal sector, the collateral system is a common response, with land as the favored form of collateral given its immobility and relative ease in ascertaining property rights and its transfer. However, actual land prices will probably be pushed above the capitalized net yield of the land, because of its collateral service (Binswanger, Deininger, and Feder, 1995). In the informal sector, credit may be tied in with other transactions, such as the purchase of harvest (Floro and Yotoupolos, 1991).

With imperfect credit markets, households can easily fall into “poverty traps”. This is exacerbated by the presence of random shocks on assets (e.g. crop loss, medical emergencies) to which the household is vulnerable under credit rationing and the absence of insurance markets. Once the household falls into the poverty trap, they are unable to obtain financing for the investment whose returns could pull them out of the trap.

A simple model proposed by Banerjee and Newman (1994) illustrates how constraints to investment credit can generate such traps. The model generates credit rationing, without appealing to adverse selection. Suppose only one good is produced, according to a production function $f(k)$, where k is the amount of capital; as usual, $f' > 0, f'' < 0$. To purchase k , the individual borrows the amount, pays the interest rate equal to r , and puts up her current wealth w as collateral. She may however abscond, forfeiting w . If she evades her creditors, she keeps $f(k)$, but if she is caught she gets nothing. The probability of being caught is $p(k)$, $0 \leq p(k) \leq 1$, where p is nondecreasing in k . The agent is risk neutral, hence she seeks to maximize expected profit.

Incentive compatibility requires

$$f(k) - (k - w)r \geq [1 - p(k)]f(k).$$

Optimal borrowing, denoted k^* , is at $f'(k^*) = r$. Then we may solve for critical wealth w^* that just provides a repayment incentive at the optimal investment:

$$w^* = k^* - \frac{p(k^*)}{r}.$$

If w falls below w^* , then the lender does not lend the optimal investment level. The reason is that there is a lower bound (zero) on the borrower's punishment. As the poor are already near zero wealth, then they are less deterred by the prospect of being caught. Note that if an individual has an endowment greater than w^* , and another slightly below it, then a reallocation of capital or wealth from the former to the latter in the current period will increase aggregate output. Information and enforcement problems prevent the market from making this reallocation.

2.4. The efficiency-equity link: Agency relations

Another source of failure in land markets arises through agency relations. When ownership of land is skewed, the owner inevitably delegates production tasks to agents. Two options are available: first, the owner hires and supervises wage labor; second, the owner delegates operations to a tenant-cultivator.

For the first option, the difficulty lies in the high cost of supervising wage labor. (Family labor requires less supervision but of course is in limited supply). The transaction cost of using wage labor is the generally posited explanation behind the stylized pattern of declining yield as farm size increases (Faruquee and Caree, 1997).

Doubts have been raised against the robustness of this stylized fact. For example, Benjamin (1995) suggests that the pattern may be partly due to the omission of variables, such as soil quality. The relationship is reasserted by Heltberg (1998). Hayami, Quisumbing, and Adriano (1990) confirm the absence of clear empirical evidence regarding scale economies in agriculture. In the case of plantation agriculture, the apparent scale economies can be attributed to coordination problems at the processing and distribution stage, and not from increasing returns at the production stage.

The second option, which is tenancy, takes the form either of fixed rent, or sharecropping. Sharecropping though faces an incentive problem, as the agent receives earnings that are lower than the marginal product value of the land. In contrast, the cultivator under leasehold receives this marginal product value. The "Marshallian inefficiency" hypothesis posits that effort of the agent is lower under sharecropping than under leasehold. Share tenancy is regarded as a feudal vestige to be superseded by leasehold with the economic development of the countryside.

However the prevalence and persistence of share tenancy has motivated theories examining its basis in rational contracting. Tenancy contracts must combine work incentives with risk-sharing. If effort level is unenforceable due to high transaction cost of monitoring, then output losses from shirking (a form of moral hazard) and from environmental factors are indistinguishable. Sharecropping may therefore arise to provide effort incentives while sharing risk (Stiglitz, 1974; Newberry and Stiglitz, 1979; Otsuka and Hayami, 1988).

An interesting suggestion by Eswaran and Kotwal (1985) distinguishes two types of moral hazard: in addition to shirking by the cultivator, the landowner may also shirk in providing managerial services to production. This provides an additional justification for the share contract. In their model, depending on the specific set of local conditions and agent preferences, sharecropping may be Pareto superior to leasehold.

Instead of moral hazard, another form of asymmetric information that could lead to sharecropping is adverse selection (Hallagan, 1978; Muthoo, 1998). Own skill or ability may be the private knowledge of a farmer, hence the contract offers are designed to screen farmers on the basis of skill. However, the adverse selection explanation for sharecropping does not seem to jibe with evidence that finds information regarding skill to be public knowledge within a village (Lanjouw, 1999). Moral hazard is deemed the more likely explanation for share tenancy.

Sharecropping has also been modeled as an outcome of imperfection in the labor market (Ray, 1999). In this interpretation, share tenancy is a form of strategic delegation undertaken by competing landowners. The model is set up as follows: the landlord can either operate the farm and hire workers, or delegate operation to a share tenant. The

structure of competition is such that when one farm reduces its wage, a rival farm must also reduce its wage. The decision to hire a tenant is construed as a *credible commitment* that a lower wage will be paid, because the tenant is given only a partial output incentive. This view is hospitable to the thesis of Marshallian inefficiency.

A survey of the empirical literature by Hayami and Otsuka (1993) nevertheless yields little evidence for Marshallian inefficiency. Agrarian contracts are found to adapt to real world enforcement problems; hence, share tenancy is more frequently observed under circumstances in which monitoring is less costly, i.e. in closely-knit communities and among relatives. A study for the Philippines confirms that share tenancy contracts between kin did not weaken production incentives (Sadoulet, de Janvry, and Fukui, 1997). There seems to be no compelling reason to attribute production inefficiency to sharecropping.

There are on the contrary, good reasons to believe that sharecropping promotes efficiency, based on the foregoing. It permits cultivation by family labor, reduces reliance on hired labor, spreads risk between tenant and landlord, and provides incentives for landlords to supply managerial input. Sharecropping also mitigates credit problems, as sharing of output is often accompanied by sharing of cost outlays. Often landowners purchase fertilizers, pesticides, and other inputs as their cost share (Otsuka, 1999). Moreover, the harvest rights acquired by the tenant upon gaining access to land opens up credit opportunities from moneylenders and particularly traders. These advantages imply that share tenancy promotes equity. Given the traditional criticism of sharecropping as a brutal form of exploitation, the revisionist view of modern economic theory is remarkable.

2.4. The efficiency-equity link: Localized linkages

The final argument regarding the inefficiency of inequality rests on the potential for localized linkages to promote rural industries when incomes are evenly distributed. We use the term "localized" to distinguish this from the traditional view that sees land reform as a means to indirectly promote national industrialization. According to this view, industrialization is precluded by the excess diversion of productive capital into relatively unproductive assets of the landed class (see e.g. Cornista et. al., 1989). This tradition does not have a coherent framework to account for this persistently inefficient, and perhaps irrational behavior, nor is there persuasive evidence to show that urban-based industrialization requires liquidation of the landed class's assets.

A localized linkages framework can be described as follows: Consider a rural economy divided into a household and a production sector. The latter is further subdivided into agriculture and manufacturing. The development of rural manufacturing; is initially dependent on strong local demand, both from the agricultural and household sectors. The distribution of household incomes may be a determinant of this demand when nonfarm goods are income elastic. The argument is most applicable to an agriculture-dependent region where the greater bulk of the population is poor, and land ownership highly skewed. Agricultural development and asset redistribution may be the impetus for growth linkages emanating from rural industry (Ranis and Stewart, 1993). The importance of income equality in promoting local linkages is echoed by Park and Johnston (1995) in the case of Taiwan.

The idea of linkages becomes intelligible³ by appealing to the concept of scale economies (Krugman, 1993), which is assumed away in the case of perfect markets.

Fafchamps and Helms (1996) construct a formal model of local linkages, summarized as follows: consider a village for which transactions with the outside world are costly. Suppose rural manufacturing is characterized by increasing returns; moreover, the proportion of manufactures in total expenditure rises with income (i.e. preferences are nonhomothetic). A multiple equilibrium situation is possible, with some levels of equilibria Pareto dominated by others. In a low level equilibrium, village manufacturing is underdeveloped given low demand for its output – but demand is low precisely because incomes are low in the absence of highly productive manufacturing activities. Under these circumstances, the impact of costless asset redistribution on the size of the rural manufacturing sector depends on the composition of demand as income varies. In one of their simulations for Guatemalan villages, they find that redistribution to reduce asset inequality may trigger rural small-scale industrialization.

These arguments hint at a dynamic aspect to the industrialization and development process. Likewise the link between efficiency and equity can be completed only by discussing the dynamic case, which is done in the following.

2.5. Dynamic version of the efficiency-equity link

The dynamic version of the model of Banerjee and Newman (1994) concludes that a one-time wealth redistribution can alter the equilibrium path and lead to higher rates of long run growth. That is, redistribution increases the wealth of the poor and permits them access to credit markets, which increases the overall rate of capital accumulation.

The efficiency-equity link may be stated in dynamic terms as the growth-equity hypothesis: a more equal asset distribution leads to higher future growth rates. In

contrast, the traditional view is expressed by the Kuznets hypothesis: as an economy grows, inequality at first rises before declining. Recent evidence tends to support the equity-growth hypothesis (Alessina and Rodrik, 1994; Clarke, 1995).

In particular, Deininger and Squire (1998) zero in on *land inequality* as a determinant of future growth. The distribution of operational landholdings is a proxy for asset distribution. Using a pooled time series and cross section country data (characterized as a “high quality” data set), they find little evidence for the Kuznets hypothesis; instead, there is a strong negative relationship between inequality and growth. Moreover, weak income growth tends to be concentrated at the lower end of a skewed income distribution.⁴

The theory and available evidence seem to favor a one-time redistribution of assets for an economy with marked inequities and feeble growth. Where landholding is an important store of wealth, and is a favored collateral form, redistribution may be targeted at landownings.

However, when risk is introduced into the analysis, a one-time redistribution of land may not lead to a permanent reduction in land inequality. Random shocks on individual wealth holdings, when credit and insurance markets are imperfect, may over time result in widening gaps between the lucky and the unlucky. Covariation of shocks, localization of land markets, and the absence of nonfarm employment reinforce these distributional trends. Land sales tend to be concentrated in periods of adverse natural or economic conditions (drought, or low prices), where “distress sales” within an area (stricken by a common shock) force land prices down. Land buyers on the other hand

possess financial assets. Hence there may be a secular tendency for land ownership to be concentrated (Binswanger and Deininger 1997; Carter and Zimmerman, 1998).

This consideration may justify complementing land redistribution with programs to offset adverse shocks, such as credit support. In the following section we examine the case of the CARP in the Philippines, which combines land redistribution with support service provision.

3. THE COMPREHENSIVE AGRARIAN REFORM PROGRAM

The CARP is arguably the most ambitious program for property rights reform in the Philippines. In this section we provide an overview of the Program, describe its current status, specify hypotheses concerning its impacts, and review the relevant evidence.

3.1. Overview

Salient features

The CARP in principle encompasses all agricultural lands. The actual coverage is estimated at 8.06 million ha., or around 83% of agricultural lands. Of these, 4.32 million ha. (around 54 %) are private lands, government lands, and resettlement areas, all falling under jurisdiction of the Department of Agrarian Reform (DAR). The remainder (3.74 million ha.) consists of public agricultural lands, including public alienable and disposable lands and some forest lands, falling under the Department of Environment and Natural Resources (DENR).

The CARL sets a ceiling five ha. ceiling on private land ownership. An additional three ha. for each of the landowner's children may be retained under owner-cultivation.

Land above these retention limits are acquired by the Land Bank of the Philippines (LBP). Landowners must be paid a "just compensation", to be determined in the course of implementation. Up to 35% of the compensation may be given in cash, with the remainder in the form of government financial instruments, and LBP bonds. The yield is set by the 91-day T-Bill. Landowners may also opt for "voluntary" sale or transfer.

Ownership of acquired land is then transferred to cultivators. Persons prioritized to receive transfers are tenants, followed by regular farmworkers, seasonal farmworkers, other farmworkers, tillers of public land, and other cultivators. Agrarian Reform Beneficiaries (ARBs) are entitled to no more than 3 ha. of land. In the case of acquired private land, ARBs are required to pay 30 annual amortizations to the LBP at six percent interest.⁵

Exempted from coverage are lands for public use, livestock and poultry farms, prawn farms and fishponds, and lands converted to nonagricultural use. The last exemption has gained notoriety, given the Local Government Code provision authorizing local governments to reclassify up to 15% of agricultural land in their jurisdiction. In addition, for commercial farms, compulsory acquisition will be deferred for ten years after the validity of the Program. For commercial estates, CARP provides alternative arrangements for asset reform, including options such as stock distribution and profit-sharing.

Land acquisition and distribution (LAD) is scheduled by the CARL as follows:

Phase 1. 1988-1992: Rice and corn lands under PD 27, idle lands, private lands under voluntary sale or transfer, and government lands;

Phase 2. 1988-1992: Public alienable and disposable lands, resettlement areas, and private agricultural lands in excess of 50 ha.;

Phase 3. 1992-1995: Private lands between 24 and 50 ha.; 1994-1998: private lands below 24 ha.

Other features of the program include enforcement of prohibitions against sharecropping, as well as rental ceilings for leasehold, which carries on previous land reform legislation. Moreover, land transactions are effectively frozen; land covered by CARP cannot be sold, while distributed land cannot be transferred for the next 10 years. (The exceptions are transfers to the government or the LBP, or transfers by inheritance).

Finally, the CARP seeks not only to redistribute land, but also raise agricultural productivity by providing support services to ARBs. These services include the provision of credit, infrastructure, technical assistance, and community organization. To operationalize beneficiaries development, the CARL also provides for the creation of Agrarian Reform Communities (ARCs). This is composed of a barangay or a cluster of barangays, which is “primarily composed and managed” by ARBs. In each area, a farmer’s organization or cooperative will be identified, which shall take the lead in the agricultural development of the locality. The ARC embodies in principle the development approach anchored on participation, local empowerment, and area integration.

The DAR is assigned as the lead agency for CARP implementation. While LAD is the responsibility of the DAR and the DENR, support services are shared with the Department of Agriculture (DA), the Department of Public Works and Highways (DPWH), the Department of Interior and Local Governments (DILG), in cooperation with Local Government Units (LGUs). The law also mandates the creation of

coordinating bodies at the national, provincial, and barangay levels. Membership in these bodies include representatives of landowners, farmers, and beneficiaries.

Accomplishments and administrative costs

Official figures on accomplishments of LAD accomplishment is shown in Table 1a. As LAD of the CARP for rice and corn lands incorporates PD 27, the figures are shown from 1972 onward. Not surprisingly, redistribution is most successful for government-owned and public lands, as well as lands under voluntary sale or transfer. The exception is public alienable and disposable lands, although the Integrated Social Forestry program (under the DENR) performs well. Least successful are lands under compulsory acquisition, which can be readily attributed to landowners' resistance. Such lands represent a fifth of CARP coverage. Contrary to popular impression, the worst record for compulsory acquisition is not in the largest size category under CARP coverage, but rather in the smallest size category.

An oft-cited source of delay is disagreements with landowners over land valuation. The formula adopted by the Land Bank is a weighted average of the price from comparable sales, capitalized net income and market value based on tax declaration. Unfortunately, reliable information on capitalized net income and comparable sales are usually unavailable; in case of the latter, CARP regulations are part of the reason for data unavailability (Bravo and Pantoja, 1998). Low assessment values also preclude reliance on the tax declaration. In the absence of clear information on land values, fiscal constraints probably lead to the systematic undervaluation of landowner's compensation. Adriano (1994) meanwhile notes that measures undertaken to prevent corruption (to

which land redistribution programs are especially vulnerable) have created a multilayered, horizontally coordinated system, further slowing down implementation.

Another problem with LAD is the tendency to perform poorly in the regions where land is more inequitably distributed (Table 1b). Consider the two worst performers in LAD, Regions 5 and 6. Based on the 1991 Census of Agriculture, the Gini ratio of landholding inequality in these regions is 0.81, compared to the national average of 0.57; these two regions account for 23.6% of national CARP coverage. Overall, it would seem that land reform has managed to redistribute land only in places where it was relatively better distributed in the first place (World Bank, 1999).

Meanwhile, Table 2 details CARP accomplishment in beneficiary development. Credit provision (mostly channeled through the Land Bank) to ARBs reaches a sizeable number of farmers, while total releases average nearly 7 billion pesos annually in nominal terms. Infrastructure provision is unimpressive, while no quantifiable benefits from farmer training are available. Finally, it is unclear whether CARP made a substantial difference in the *quantity* of services being delivered (given that these services are standard fare of government development programs), or in the targeting of these services (i.e. specifically towards new land awardees).⁶

Implementation of the CARP is financed by a special fund,⁷ whose breakdown is shown in Table 3. These are again nominal figures spanning a 12-year interval. Total cost averages less than 5 billion pesos a year, which is only one-fifth of average public agriculture and natural resource expenditures per annum from 1989-1998 (based on data from David and Inocencio, 2000). Landowner compensation takes up less than a third of total cost, which is expected given the low rates of accomplishment in distributing private

lands. Nearly a quarter of administrative cost is taken up by personnel services, in contrast to the 12% allocation for infrastructure, a highly capital-intensive activity. The administrative demands of the Program under the overall fiscal bind can explain this seemingly lopsided allocation.

3.3. Field evidence on CARP implementation

Here we go beyond the official statistics, which present accomplishments on a highly aggregated basis, to findings on the progress of CARP implementation at the farm level. First we identify and briefly describe several "major data sets" specifically designed for CARP evaluation. We rely heavily (though not exclusively) on these data sets as the main vehicle for agrarian reform impact assessment.

The major data sets

Except for the panel study conducted by the World Bank (Deininger, et. al., 1999), which is based on village surveys, the major data sets emanate from following nationwide surveys:

1. The Benchmark Survey (covering crop year 1989-1990)
2. The ARB Performance Monitoring and Evaluation System (PMES)
 - Phase 2 (crop year 1994-1995)
 - Phase 3 (crop year 1996-1997)
3. The Benchmark Survey of ARCs (crop year 1993-1994)
4. MODE Impact of Agrarian Reform Survey (crop year 1996-1997)

Except for the fourth, which was undertaken by a nongovernment organization (MODE Inc.), these surveys were commissioned by the DAR to the Institute of Agrarian and

Rurban Studies (IARDS), formerly the Institute of Agrarian Studies (IASt), at the University of the Philippines at Los Baños. These surveys have all different sampling frames (and even PMES 3 differs from PMES 2); the closest we can get to a time series is the Benchmark Survey -MODE Survey comparison, although even here significant noncomparabilities should be noted. Further details regarding these data sets are available in the Annex.

Accomplishment of agrarian reform based on the nationwide studies

The PMES Surveys describe the average ARB as similar to the typical farmer. The head of the household is usually male, married, with 3-4 children, is in his 50s, and has received little more than primary education. The other surveys with a broader class of respondents do not deviate much from this characterization. The portrait of the beneficiary as a smallholder is justified: according to the PMES 2, average farm size of the ARB is only 2.41 ha. The MODE Survey estimates average farm size at 2.6 ha. Similarly, the 1991 Census of Agriculture and Fisheries estimates the average farm size in the country at 2.2 ha.

Table 4 shows the distribution of farmers by type of tenure. Sharecropping, an illegal arrangement, accounted for a quarter of the sample in the 1989 Benchmark. The MODE survey shows that, despite six years of CARP implementation, practically the same proportion (25%) of farmers remain share tenants. Likewise, there is no recorded increase in the proportion of owner-cultivators.

Meanwhile, the PMES Surveys, along with the ARC Survey, report a low incidence of sharecropping among ARBs. All of the surveys though report higher proportions of amortizing owners compared to the Benchmark 1990 figure. The MODE

Survey however shows only a minimal change in the number of owners. The MODE Report further states that only 8.2% of owner-cultivators claim to have received their land from the CARP; instead, 58% inherited their land, while 32% purchased it outright.

We note that the rice and corn are the major crops raised by ARBs (57%, according to the PMES 3). All the respondents in the ARC survey planted rice and corn, while rice is planted by over 60 % of respondents in the Benchmark and MODE surveys. The bulk of the reported accomplishments for rice and corn farmers may actually be due to the implementation of PD 27, even prior to CARP.

The data in Table 5 regarding support services is not very encouraging. Even among the ARBs, as reported in the PMES, a substantial minority (33%) does not recall receiving assistance from any government agency or unit. Naturally, in the surveys which includes non-ARBs, the proportions receiving assistance are much lower than those reported in the PMES. The PMES 3 Survey is more upbeat: 63% of ARBs recall receiving government assistance. In this survey, assistance is classified by activity, namely: training (39%), fertilizer dispersal (9%), animal dispersal (7%), seed dispersal (11%), infrastructure (27%), technology transfer (31%), postharvest facilities (4%), marketing assistance (1%), and crop insurance (2%).

Agrarian reform accomplishment based on the panel study

The panel study observes that, consistent with the findings of the nationwide surveys, a decade of CARP implementation has failed to eliminate altogether share tenancy even in rice farms. Only 12 % of the sample in 1985 are share tenants, which was the result of aggressive implementation of PD 27 prior to CARP; in 1988 share tenants still account for 8% of the sample.

A more alarming trend is the simultaneous increase, not only of ownership, but also of landlessness in the surveyed villages. Owners comprised a quarter of the sample in 1985, 38% in 1998; meanwhile, an additional five percent of the sample became landless. This is probably an underestimate given the possibility of out-migration.

Movement up the "agricultural ladder" seemed to have been slowed down during the CARP period. This may not have been due only to the increasing share of owner-cultivators (i.e. more and more families reaching the top of the ladder), but perhaps also because of increasing landlessness (more and more families failing to get on the first rung). Former share tenants and landless workers comprised 82% of the new owners in 1988 (compared to 1972), but accounted for only 20% of the new owners in 1998 (compared to 1985). A probit estimation confirms the observation. The evidence suggests the PD 27 had been targeted to the poor, but targeting of the CARP was not motivated by poverty alleviation. Apparently the DAR focused on completing the unfinished business of the pre-CARP reform, by granting land ownership to leaseholders and awardees of the Certificate of Land Transfer under PD 27.

We may add here that the success of the PD 27 program, in contrast to the laggard CARP, has been largely attributed to the coincident onset of the Green Revolution (Otsuka, 1991). Effectively, PD 27 maintained the land incomes and values of the landowners at the pre-reform levels, defusing their opposition; leaseholders and land awardees meanwhile received the income gains from the introduction of modern varieties. There is evidence to suggest that payments of leaseholders are only half that of share tenants precisely because of these lease controls (Otsuka, Cordova, and David, 1992).

3.4. Hypotheses regarding impacts of reform

We have noted earlier the hypothesis that asset inequality is negatively related to future growth, hence measures intended to reduce inequality, such as agrarian reform, may promote later growth. For the Philippines however, no study has yet been conducted to regarding the link between asset inequality and growth. Balisacan (1999) investigates the link between initial landholding inequality and subsequent regional poverty, and finds a strong positive relationship. Quite possibly the causation runs from equality to growth to poverty reduction, although further study is needed to finalize this claim.

A possible pathway for the growth effect is that wealth equality promotes local consumption linkages and consequently the expansion of rural industries. The inequality-rural industry link for the Philippines is explored by only one study (Ranis, Stewart, and Reyes, 1989), but even this one fails to assemble evidence from village data. Hence the inequality-rural industry link remains an unsubstantiated though interesting conjecture. We therefore focus on the more specific hypotheses regarding CARP impacts.

Expected CARP impacts

According to our framework, the land distribution component of the Program may enhance economic efficiency. In the case of public land transfer, and perhaps even for government-owned lands, beneficiaries may in most instances be the current occupants. Hence the transfer essentially formalizes land rights, thus establishing tenurial security. Given that the bulk of CARP accomplishment in LAD fall under this category, (63 %, excluding forestry areas which account for another 16%), we may expect this to be currently the major source of CARP redistribution benefits. However, we note first that no studies have been conducted on awardees of government and public property

regarding the productivity impacts of tenure formalization under CARP. Hence we focus on the impacts of CARP on private non-government lands.

Credit services in support of CARP also serves a function in overcoming market failures. Meanwhile, infrastructure, technical assistance, and even community organizing may be understood in terms of provision of public or quasi-public goods, which markets are ill-equipped to supply. These complementary services are perhaps essential to breaking the dynamic trend towards inequitable land distribution and its attendant efficiency losses.

On the other hand, the Program is not an unalloyed measure to enhance efficiency. Some of its features introduce distortions in agrarian markets. Tenancy regulation induces owner cultivation with hired labor, which as we have seen may be less efficient. On the other hand, the permitted tenancy contract, which is leasehold, expose the tenant to more risk. Moreover the regulation of land markets further suppresses the development of the markets for land rights. Even as the Program aims at expanding an ownership base, access to land for non-owners is restricted.

These regulations can further fragment the fragile credit market. In the informal sector, the shift to owner-cultivation and leasehold may sever landlord-tenant ties characterized by interlinked credit and cost-sharing. Restrictions in land access may also constrain the credit ties with other lenders (i.e. traders, input dealers, etc.) who typically practice informal collateralization of the farmer's share in the produce.

In the formal sector, lenders such as banks may experience a dramatic climb in the transaction cost of agricultural lending, as a burgeoning mass of owner-cultivators apply for small loans. In addition, and perhaps most importantly, landowners may find

themselves rationed even more severely in the credit market, as the collateral value of their land vanishes in the face of restrictions on land transactions.

The protracted and unpredictable implementation of the Program is another source of distortion. Even as CARP extends land rights to occupants of government and public lands, it on the other hand undermines private land rights in the interim. Incentives to invest in land improvements may therefore be weakened. Moreover, given that only agricultural lands are covered, a common criticism of the Program (aired especially by vocal farmer groups) is the failure to address evasive land conversion.

We summarize the foregoing by stating the following hypotheses:

1. *Credit, investment, and CARP beneficiaries.* Land awardees obtain more credit and accumulate more assets than in the absence of the Program.
2. *Land access and CARP.* The Program restricts access to land, thereby suppressing upward mobility of the rural poor.
3. *Credit, investment, and landowners*
 - 4.1. The Program reduces landowner's investments in land improvements.
 - 4.2. The Program reduces aggregate investments due to the diminished collateral value of agricultural land, and to scale diseconomies in smallholder lending.
4. *Land use and CARP.* The Program introduces inefficient land use practices due to uncertain acquisition and regulation of land markets.

Our next task is to verify whether the literature contains empirical substantiation of these conjectures. First we consider findings concerning landowners (hypotheses 3 and

4), for which the evidence is sparse, and findings concerning actual or potential beneficiaries (hypotheses 1 and 2) for which we may draw from the major data sets.

3.5. CARP impacts on landowners and land use

The incentive effects of CARP on land investment are uncertain. A survey of the Management Association of the Philippines in 1990 found that over 60% of 39 respondents (farming over 72,000 ha) either reduced their investments or shelved expansion plans (Llanto and Estanislao, 1993). Even granting that this survey is credible, the only other evidence remains anecdotal. Meanwhile, the erosion in the collateral status of land has been looked into by Llanto and Dingcong (1994). They gather data on borrowings by landowners and agrarian reform beneficiaries. Using logit regression, they determine that the probability of being rationed does not depend on the size of agricultural land, which suggests that such property has lost its collateral value. However the magnitude of the implied credit reduction is unclear.

Clarete (1992, as cited in Llanto and Estanislao, 1993) has attempted to quantify the welfare losses arising from the loss of collateral value of land, using Computable General Equilibrium (CGE) methods. He estimates the productivity of farming and other primary sectors to fall by 4.7% and 3.7% respectively as a result of this effect. The annual decline comes to around two billion pesos a year. These magnitudes, as with any simulation results (however well done), can only be indicative.

Some evidence on rising transaction cost has been gathered by Casuga (1994). Based on her sample of 64 formal sector creditors, she measures the transaction cost in 1986 (before CARP) as 4 centavos per peso loan for rural banks. Three years later, (after

one year of CARP implementation), the transaction cost grew to 9 cents per peso. However, she rightly cautions against attributing this increase to the Program.

Likewise, little can be said about the actual land use distortions inadvertently imposed by CARP. Land conversion, a hotly disputed issue in land use, does not appear to reach alarming proportions; approved conversions totaled only 1.2% of DAR coverage by 1997, and only 1.3% of total rice areas. Even taking into account illegal conversions, such behavior cannot on the whole be seen as endangering CARP objectives. Nevertheless, the future potential for expanded land conversion is a cause of concern, as 88% of municipalities lack a land use plan (Gordoncillo et. al., 1998).

To summarize, there is mild confirmation of hypotheses 3 and 4, but we have no hard evidence regarding the seriousness of the hypothesized welfare losses. We now see whether a greater quantity and better quality of data is available regarding other aspects of CARP impacts.

3.6. CARP impacts on actual and potential beneficiaries

In the case of CARP impacts on actual and potential beneficiaries, we examine issues of credit, capital accumulation, and land access. As a preliminary, we review data on productivity and incomes.

Production and earnings

Yield comparisons by crop are presented in Table 5. The ARBs produced approximately the same yields as the average farmer. The only serious divergence is the estimate for rice yield from the MODE Survey. Smaller surveys also suggest that yields of CARP-affected farmers are similar to national yields, e.g. Geron (1994). We

intentionally avoid drawing implications on productivity trends from these figures, given the multiplicity of factors affecting yields.

Table 6 presents the magnitude and sources of income. Poverty incidence of families among ARBs is over 60%. According to the MODE Survey, 70% of respondents were poor, based on a slightly higher poverty line than that used in the PMES. Note though that, except for the PMES 3, computation of sample poverty used total household incomes, hence requiring the imputation of a family poverty line (unadjusted for household size). These figures are much higher than official figures on rural poverty of households (44.4% in 1997). The appropriate comparison though is with poverty in agricultural households, for which no figures are available in 1997, though previous studies suggest that agricultural poverty is higher than rural poverty.⁸

Income from farming accounts for less than half of total household income; on this, all three surveys conducted in the mid-1990s agree. Meanwhile off-farm incomes accounts for only 5-10% of household income; this leaves nonfarm incomes, which accounts for a large share in earnings. The surveys covering 1996 show that over half of family income is nonfarm. In the ARC Benchmark Survey, nonfarm incomes were apparently the source of inequalities, due to OCW remittances; in the PMES 2 however, the distribution of the share of nonfarm income in total income did not vary much across income deciles (Bravo and Pantoja, 1999).

We note however that household incomes figures may not be fully comparable across surveys. Consider net farm income per ha. (gross of rent): in the MODE Survey to be 17,942 pesos for rice, 6,892 pesos for corn, and 3,830 pesos for coconut. Contrast this with the corresponding PMES 3 estimates: 35,718 pesos, 12,801 pesos, and 2,508 pesos.

The divergences are perhaps too large to be accounted for simply by the profit edge of ARBs.

Credit

According to the MODE survey, 47% of respondents are dissaving. The PMES 3 reports that 54% of ARB respondents borrowed, similar to the 56% among the respondents in the MODE Survey. According to the latter, a greater proportion of ARBs and leaseholders are borrowers, compared to other respondents. Table 7 details the sources of credit. The PMES Surveys seem to show a large increase in credit access; this is due to the unusually low proportion of respondents (30%) who claimed to have borrowed in 1994.

Borrowing from formal sources appears quite limited. Instead, respondents who borrowed relied mostly on informal credit. Contrary to popular impression, moneylenders are not the main source of informal credit - the surveys show an important role played by credit from buyers (MODE) and suppliers (PMES 3). The former is probably an interlinked scheme, while the latter are probably trade credits from fertilizer, pesticide, and seed dealers. Collateral was demanded by informal lenders from only a few of the borrowers (27%, according to the MODE Survey).

The PMES surveys contain data on ARB amortization compliance. A little more than a tenth of ARBs were irregularly paying amortization in 1994; by 1996, this proportion reached one-fifth. While the survey rules out ARB default on a massive scale, no information is available regarding the severity of the default threat among the irregular payers. Nor have any studies been conducted as to the measures taken by the Land Bank

to deal with these cases, particularly with ARBs who have ceased repayment (7 % in 1994).

To summarize, the data allows us to say that agrarian reform beneficiaries are not less productive than average small farmer, and are even poorer (but not much poorer) than the typical agriculture-dependent household. There is a significant dependence on nonagricultural earnings, and there are indications that this dependence is growing. Many of them borrow, but mostly from the informal sector, where fixed asset collateral is seldom required. Note that the agrarian reform regulations preclude land collateralization even of full-fledged owners-beneficiaries, for at least ten years upon award. Nor can government credit be expected to substantially offset this, given weak availment rates of cooperative credit, which is the main channel of this credit support.

The major question of course is whether CARP or agrarian reform in general resulted in favorable trends in productivity and income. The question cannot be answered using the available nationwide studies. First is the issue of causation, which is most effectively addressed by regression analysis⁹, is not conducted by the nationwide studies. The second issue is more basic and has been mentioned earlier: the sampling frames differ across surveys, making intertemporal comparison difficult if not impossible.¹⁰

Capital accumulation

The panel study yield productivity and income trends that suggest improving agrarian circumstances of households in the course of agrarian reform implementation. Average household incomes in real terms rose by 46% between survey rounds; by 1998, average household expenditure was above the World Bank poverty line. There is

however no trend towards greater diversity of income sources, as agriculture continues to provide the bulk of household earnings.

Multivariate analysis is employed by this study to isolate the contribution of agrarian reform to these trends. The method consists of regressing (in differenced form) an outcome variable against household attributes, time trend, and a reform beneficiary dummy. The study found that *agrarian reform beneficiaries were able to educate their children more and accumulate more assets*. That is, agrarian reform increased investments in human and other capital. The magnitude of the welfare gains is significant by any standard, as land reform beneficiaries earn 30% more than the national per capita income.

The explanation given in the study for these wealth effects relies on the idea that an asset transfer lifts the growth trajectory by encouraging investments and easing credit constraints. The study however gives no direct evidence regarding credit impacts of agrarian reform. A more straightforward explanation rests on the abovementioned wealth transfer successfully accomplished by land reform under PD 27; even for leaseholders, an income transfer was introduced through rent ceilings.

Land access

Once more the nationwide studies are largely silent about land access. Meanwhile village surveys over the last two decades have strengthened the conviction that agrarian reform does restrict access to land. The evidence could be as straightforward as tenant eviction: A survey of five villages in Central Luzon and Panay conducted in 1986 (Otsuka, 1991) reports that one-fifth to one-half of tenants were evicted.

The emergence of permanent labor contracts is persuasive circumstantial evidence regarding the decline of land access opportunities. A new kind of labor contract in Central Luzon, called the *kasugpong*, is probably substituting for the prohibited tenancy contracts (Hayami and Otsuka, 1993). The proportion of permanent laborers in landless workers in some Central Luzon villages has increased from virtually zero, to around 30% by the 1980s, after two decades of PD 27 implementation. Under this permanent labor contract, a worker receives a fixed amount of paddy rice, or a small proportion of harvest, in exchange for services throughout the cropping season. However, by the fixed nature of the payment to these workers, labor requires constant supervision and is prone to shirking. In the Central Luzon farms, the residual profit from *kasugpong* farms is around a quarter below those of family-operated farms.

More direct evidence on the reform-land access link is given by the panel study. A nonparametric regression finds that ownership of land is strongly related with size of landholding, whereas under a healthy rental market no such relationship should be found. A parametric regression confirms that area cultivated is strongly affected by size of owned land. The welfare impact of restricted access could be substantial: the consumption of the landless who later successfully gained land access was 30% greater than those who failed.

On the whole, the negative impact may well have exceeded the benefits of agrarian reform. Prohibitions on share tenancy as well as rent controls denies ascent of the "agricultural ladder" to the landless. Adverse equity and efficiency consequences are expected to the extent that poverty is concentrated in this sector, as is the finding of income studies (Balisacan, 1993; David and Otsuka, 1994).

3.7. Implications for policy

If indeed the hypotheses mentioned earlier hold for the Philippines, then the policy prescriptions for changing course in agrarian reform become clear. The experience of World Bank-supported land reform programs may be used to enumerate a set of broadly stated best practices (Deininger and Binswanger, 1999). The World Bank policy agenda proposed in the mid-1970s rested on the desirability of owner-operation, of active land markets, and of an egalitarian asset distribution. The merit of the agenda has been largely confirmed over a quarter of a century, while hindsight adds a few observations. One is that land transfers should be accompanied by broader efforts to improve related markets and infrastructure. Another is that the reform process should take into account the considerable potential of markets for land rentals and sales in promoting land access and egalitarian land distribution.

Restrictions on tenancy and land markets must therefore be lifted (Otsuka, 1999). Another recommendation is to shift away from the crude coercion of land distribution, towards the more subtle coercion of land taxes. Progressive taxes on land, and taxes on idle land, are highly favored as relatively efficient instruments for indirect land redistribution (Hayami, Quisumbing, and Adriano, 1991). Revenue possibilities from progressive land taxes are respectable, as the CGE simulations of Habito (1989) has shown.

The administrative demands of levying such taxes are however daunting, particularly at the national level. First, landowners would be likely to misdeclare land ownership and quality. Second, land taxes encounter considerable opposition from landed

interests, particularly when they see it as an pure tax burden, whereas the constituency for such taxes are diffuse (Skinner, 1993).

An emerging consensus on land reform is to back up tax instruments with "negotiated" solutions, to be implemented in a decentralized fashion with reliance on beneficiary participation (Deininger, 1999). This format goes beyond the "voluntary" component now prevailing in the CARP. Deininger et. al. (1999) suggests that the opposition may be mitigated by credibly tying revisions in the tax regime with the lifting of restrictions on land markets, and even of ownership ceilings. While other recommendations fall short of calling for a repeal of retention limits (e.g. Hayami, Quisumbing, and Adriano), there is a broad consensus among economic analysts regarding the foregoing features of land reform reform.

3.8. Summary and research issues

Our summary recapitulates the discussion on the general link between equity and growth in the Philippines, as well as the impacts of agrarian reform on landowner investment as well as intended beneficiaries.

First, *the positive relationship between land ownership equality and future growth is yet to be convincingly demonstrated for the Philippine case.* We do however know that asset equality is positively related to future poverty reduction. Because of this and other considerations, we have good reasons to expect the posited relationship to hold. The requisite test is not too demanding; one needs to conduct analysis, perhaps on a regional level, comparing area growth rates with some measure of initial asset inequality. The available measure pertains to operational landholdings (available from the Census of Agriculture and Fisheries).

A more demanding but still feasible exercise may be to use as a measure the inequality of land ownership. It is possible to work on the existing DAR and Land Registration Authority records to assemble a database on recent land ownership patterns by region,¹¹ and compare this with subsequent growth rates. In this vein, much work still needs to be done on the relationship between income inequality, local linkages, and the growth of rural-based industries. Data from ARCs can help frame this particular thrust.

Second, *evidence concerning foregone landowner investment due to agrarian reform remains little more than anecdotal*. We therefore recommend intensive data gathering - from landowners, banks, and other financial intermediaries - to quantify the investment losses attributed to agrarian reform. Preliminary efforts based on rapid appraisal methods will be a good start.

Third, *the contribution of agrarian reform to incomes and assets of beneficiaries of private land redistribution established by village surveys await nationwide generalization*. Data gathering should focus not merely on ARBs but rather on representative sample of the rural population; data should focus on production, income, credit, assets, and education. If possible, the impacts from various agrarian reform interventions should be isolated. Moreover, nationwide surveys of rural households should be undertaken repeatedly and consistently. The past decade has seen several lost opportunities for a time series comparison to track trends for beneficiaries and non-beneficiaries.

Fourth, *the implications of land market regulation on land access, equity, and poverty should be quantified at the national level*. The findings on land access trends based on village studies also require generalization to the national level, more so since

outmigration may conceal the magnitude of rental market suppression. Hence in the preceding recommendation, the envisioned nationwide studies must be representative enough to include a sufficient proportion and number of the landless. The existing nationwide surveys nevertheless can be mined for further information, if not about trends, at least about the link between land access and ownership. Moreover, a well-rounded analysis require analysis of agrarian contracts, that may arise to circumvent the land market restrictions. Research should proceed beyond some well-researched villages and provinces onto other informal rural markets all over the country.

Fifth, *practically no work has been done regarding the productivity and welfare impacts of providing tenurial security to occupants of government and public lands.* This gaping chasm in agrarian reform research is striking, given the concentration of land distribution accomplishment in these types of land. Research specifically intended at quantifying only CARP impacts, as distinct from the cumulative effects of land programs undertaken in the country, should probably take this issue as a starting point.

Sixth, *policy research may begin to seriously investigate tax-oriented, and otherwise noncoercive schemes for agrarian reform.* Admittedly, we are still waiting for evidence on the effects of land market restrictions to reach a critical mass. Nevertheless, the implementation roadblocks encountered so far already calls into question the intent to "finish the unfinished business of agrarian reform." Rather, innovative approaches to rural land markets should increasingly draw attention from policy analysts and policymakers.

4. PROPERTY RIGHTS REFORMS IN FISHERY AND FORESTRY

We now turn to other important property rights reforms in the natural resources sector. We discuss first the evaluation framework, in terms of the economic analysis of extractive activity, and the institutional responses to deal with resource degradation. We then review programs and studies on property rights arrangements in this sector.

4.1. Framework

There are three reasons why the *status quo* in fishery and forestry exploitation tends to excessive extraction. The first two are static allocation problems, while the third refers to dynamic tradeoffs between current and future uses of a resource. The following incorporates standard textbook treatment of these issues (e.g. Johansen and Lofgren, 1985).

Open access

Fishery and forestry resources are regarded as **common pool resources** (CPRs), where the resource is subject to multiple use, difficulty in exclusion, and rivalry in the extracted resource, *i.e.* fish catch or logs (Ostrom, Gardner, and Walker, 1994). The problem of the "commons" (actually an open access problem) was pointed out in a seminal paper by Hardin (1968). Consider a resource stock which yields a homogenous harvest to users upon application of effort. Suppose the cost of each unit of effort as well as the price of the harvest be constant. The set of users is the industry, and industry effort is subject to diminishing marginal product; in the region of diminishing returns at the margin, average product exceeds marginal product and is falling.

Open access implies free entry, hence equilibrium is reached when the marginal user earns zero profit. This implies equality between average product and marginal cost of effort. The optimum though is at the point at which marginal product equals marginal cost. The equilibrium effort implies over-harvesting of the resource. A user is unable to take into account the external effect of her own effort on the harvest of others.

Off-site services

Natural resources such as forests provide a wide range of environmental services (watershed maintenance, erosion control, wildlife preservation, etc.). When forests are felled, the loss of these services involves a cost above that of the extractive activity itself (e.g. timber cutting and hauling). The extraction cost and off-site cost together constitute the social cost. The private sector firm will extract timber until the marginal cost of extraction equals the unit value of the timber. The social optimum though involves equality of the unit value of the timber with the marginal social cost, hence the private firm's equilibrium involves excessive extraction. For example, downstream siltation of lakes and reservoirs imposes costs that are not taken into consideration by the logging company, hence too little forest cover is maintained.

Intergenerational concerns

The foregoing refer to externalities imposed by a user on other current users. There is a different type of externality imputed to future users. This brings to the fore the idea of *sustainability*. Consider once again a given resource which yields a homogenous harvest. To isolate the intergenerational aspect of the exploitation problem, we consider the case of a privately-owned resource, where extraction involves no off-site costs.

Let the discount rate be r . Various stock levels of the resource are possible, ranging from the minimum threshold, to the maximum carrying capacity. Below the threshold, the population declines to zero; beyond the carrying capacity, the stock will also tend to decline. In between the threshold and the carrying capacity, the stock grows. The growth rate at first increases with the stock level, then decreases to zero towards the carrying capacity.

At equilibrium, the harvest equals the growth rate, hence the resource stock remains constant. The equilibrium stock is that level at which the (positive) *change* in growth rate equals the discount rate. Hence if the discount rate *increases*, the equilibrium stock falls (in order to realize greater changes in the growth rate). It is quite possible for the discount rate to be sufficiently high, such that the short-term equilibrium stock is set below the threshold level - implying complete extraction of the resource in the long run.

The problem with the equilibrium solution is that the value of the resource, as well as the discount rate, is set only by the current generation. Compared to valuation that represents future generations of users, the harvest price may be too low, or the discount rate too high. The problem is starkly put when long run equilibrium entails extinction of a species. The future generations may desire some positive population of the species, but its irreversible elimination precludes this option.

Regimes for reducing exploitation

Regulation and taxation instruments. To correct these externalities, the State faces the challenge of a cost-effective means of limiting extraction effort. The most direct method is administrative regulation. However the geographic sprawl of the CPRs as well as transportation costs have in many countries rendered this instrument largely

ineffective (Hyde et. al., 1996). Another means is to impose harvest fees, or taxes. If set at the right rates, theoretically taxes and fees can lead to a complete internalization of costs, though the implementation costs may be high or prohibitive.

Private (individual) land rights. A recent alternative policy is the promotion of property regimes in CPRs. One option is to confer land rights to individuals. Such an option is feasible for forestland, where numerous titling or other tenure programs have been undertaken in developing countries. It should be noted that, even in theory, privatization can be effective only against the open access problem; it cannot be regarded as a means to adequately account for off-site costs sustainability concerns.

In practice, establishing private property arrangements must contend with the costs of enforcement. The evolutionary theory predicts that, where benefits of internalization exceed costs, private property rights will evolve; the absence of such arrangements is *prima facie* evidence that private property arrangements are too costly. Forest products are low value but also have low marginal extraction cost, whereas the cost of limiting access even for a private landholder is typically large (Hyde et. al., 1996).

Tenurial programs are often coupled with agroforestry projects - in the framework of the evolutionary theory, this is to raise "the benefits of internalization." Internalization of costs can be facilitated by extension efforts and subsidies packaged into conservation programs. Clearly, tenurial security is a prerequisite to successful internalization, which a titling program presumably provides. Predictably, successful examples of such projects suggest that profitability is a critical element, while quicker gestation projects are favored by farmers. Tenurial security promotes investment and innovation. Interestingly, the greatest threat to security comes from government

regulation (Current et. al.,1995), i.e. the threat of imposing logging restrictions can effectively nullify tenurial arrangements and reduce the incentive to protect the property right.

A drawback to these efforts even if private property rights can be effectively enforced, is the that land titling programs, or even the expectation of such programs, may actually *hasten* deforestation. The perverse possibility arises because occupancy is usually the criterion for obtaining a title, hence providing an incentive for clearing activity (Angelsen, 1999).

Common property. The third option is for CPR management is the promotion of common (in contrast to private) property arrangements. The durability of common property arrangements, some of them rooted in ancient tradition, has motivated numerous attempts to analyze the effectiveness of common property arrangements in resource management. At the simplest level, communal arrangements realize scale economies in protection activities; in terms of production, however, individual rights are typically bestowed on the basis of land clearing and occupancy. Hence customary tenure is not exactly inimical to commercial activities such as agroforestry (Otsuka 1998). Collective production is *not* a common feature of communal arrangements, contrary to popular belief; rather, such arrangements provide public goods, enhance equity, undertake risk-reduction, or help break seasonal labor bottlenecks (Deininger and Feder, 1998).

Factors conducive for a group to govern its members effectively have been compiled in a famous list by Ostrom (1994), which is based on a wide range of case studies. These factors are:

exclusion of nonmembers from the resource

appropriateness to local conditions

membership participation in rule setting

accountability in monitoring

application of graduated sanctions

presence of low-cost conflict resolution mechanisms

recognition by the formal authority

nesting of cooperative groups in large organizations.

Meanwhile a formal approach typically employs game theory. Common property arrangements are interpreted as a cooperative equilibrium achieved by the players. The more appealing models employ repeated interaction, where the central idea is that exclusion from future benefits is the disincentive to noncooperative behavior. For cooperative equilibrium to be possible, the player must perceive the number of repetitions to be indefinite, retaliation from other members credible, and the future sufficiently important (Seabright, 1993). Unfortunately, as expressed in the "Folk Theorem", cooperative behavior is not the only possible equilibrium; nor is it clear that a cooperative equilibrium is robust to environmental and group change.

One extension of the theory of cooperation is to examine the role of history in the evolution of social *norms*. Sethi and Samanathan (1996) model the development of social norms as the evolution of strategies in terms of "replicator dynamics". Strategies are increasingly adopted when their payoffs yield more than the average payoffs. They find that norms of restraint and punishment can be stable, even against the entry of narrowly self-interested players.

Another extension recognizes that communal arrangements need not fit into a cooperative/noncooperative dichotomy; rather, a wide range of success in various aspects of resource management are possible. McCarthy, de Janvry, and Sadoulet (1998) regard cooperation as a matter of degree, and subject to variable costs. Their model providing a flexible framework for identifying factors that raise or reduce the equilibrium degree of cooperation.

4.2. Programs and reforms in the forestry and fishery sectors

The DENR takes the lead role in the administration of programs and implementation of policies for the natural resource sector. For forestry, extraction is regulated under Timber Licensing Agreements. The agency is also implementing several programs to address forest denudation as well as the upland poverty. We have already encountered tenure programs in forest land under CARP, referred to as the *Integrated Social Forestry* Program. Beneficiaries of this program are issued Certificates of Stewardship to provide them security of tenure. The Certificates are nontransferrable. Oversight of the projects has been mostly devolved to the LGUs since 1991.

The *Community Forestry Program* meanwhile assigns forest protection and management to organized communities. The privilege to use and sell forest products is formalized in a 25-year Community Forest Management Agreement. By 1997, there were 66 such Agreements, covering 173,298 ha. Other community-based programs are the Forest Land Management Program (covering reforested areas) and the Regional Resources Management Program.

For fisheries, legislation has been consolidated in the Philippine Fisheries Code of 1998. The other important laws are the Local Government Code (LGC) of 1991, and the

Agriculture and Fisheries Modernization Act (AFMA) of 1997. The LGC defined the scope of municipal fisheries to cover waters up to 15 kilometers from the coast. Boats above 3 tons (which are classified as commercial vessels) are not allowed to fish in these areas. It also expanded the authority of LGUs in administering these areas. The municipal authority was empowered to enforce fishery laws, license municipal fishers, grant privileges to organized fishers in constructing immobile gears, and otherwise regulate local waters. Meanwhile commercial waters remain the responsibility of the national government, specifically the Bureau of Fisheries and Aquatic Resources.

The Fisheries Code, as well as the AFMA, made explicit the principle of *sustainable development* in the management of agricultural and fishery resource (Israel and Roque, 1999). For commercial waters, licensing and fishing permits are supposed to reflect resource rents as well as regulate harvests to the level of the Maximum Sustainable Yield. The Code also enumerated various sanctions on illegal fishing gear, exploitation of sensitive resources, catch limits, restricted fish species, and so forth.

4.3. Evaluation studies for the Philippines

Incentives and environmental degradation

Forest denudation in the country is typically associated with upland migration; estimates of upland population range from one-tenth to one-third of the total population. This suggests "push" factors, given declining person-land ratios and nonfarm employment opportunities in the lowlands (Cruz and Repetto, 1992). Upland dwellers, as well as coastal fishermen, comprise some of the poorest sectors in the country, with subsistence activities being the norm. Upland poverty itself is sometimes thought to be a

contributor to unsustainable land use practices; this notion is not however empirically substantiated, nor are there strong theoretical arguments in its favor. (Grepperud, 1997).

Coxhead and Rola (1998) find that "pull" factors in the form of price incentives are also important, particularly for the spread of erosive farming. Lack of access to credit constrains the adoption of conservation measures. Increasing access to credit has however an ambiguous impact on soil erosion, as land clearing is also positively related with credit access.

Meanwhile for fisheries, Israel (1997) found that virtually open access regime in commercial waters resulted in fishing effort far in excess of that required for Maximum Economic Yield, or for Maximum Sustainable Yield. In 1994, fishing effort should have been reduced by about 12% to attain the maximum sustainable yield, whereas to attain the maximum economic yield, the effort should be reduced by nearly half (45%).

Environmental taxes and subsidies

The consensus among environmental observers is that extraction charges are too low, given the rents earned. In the case of forestry, an early calculation (de los Angeles, 1989) found that charges extract less than a tenth of resource rent. For fisheries large resource rents are likewise being earned; the fees moreover had not been adjusted since the early 1980s (Israel and Roque, 1998). However fee increases may meet strong political opposition; Elazegui and Paunlagui (1999) cite an example of a municipality which could not raise fees due to vehement local objections.

Government programs to promote sustainable technology do promote adoption of conservation measures. Adoptions rates among cooperators in the Central Visayas Regional Project is found to be higher than for noncooperators. Moreover, the degree of

participation is positively related with the adoption choice. Incomes of cooperators are also shown to be higher than incomes of noncooperators, and to have increased faster over the eight years of program implementation (Francisco, 1994).

Tenurial security and property rights

De los Angeles (1994) claims that the link between upland conservation and property rights is "no longer debatable". She cites studies which found that the extent and pace of adoption of conservation measures differ between CSC holders and non-CSC holders. Coxhead and Rola (1998) confirm that less secure tenure in the uplands is associated with the adoption of erosive farming.

As mentioned earlier, tenurial security may be undermined by government regulation. The threat of imposing a total log ban casts a veil of uncertainty over upland property rights arrangements. Most likely, given the enforcement costs, elimination of formal rights will lead to informal encroachment. The *de facto* open access state may therefore reassert itself. Extreme logging restrictions may therefore unintentionally promote forest destruction (de los Angeles and Oliva, 1996).

Promotion of community-based management

The building of community organizations for forest management is confirmed to be an important factor in the adoption of agroforestry schemes (Francisco, 1994). The promotion of *co-management* (where the State retains ownership of the resource but users also undertake resourcement management) in fisheries is currently an active research area of the International Center for Living Aquatic Resources Management (ICLARM). Among the Asian countries considered (Philippines, Vietnam, Thailand, Malaysia,

Indonesia, and Bangladesh), the Philippines was singled out as having identified as having the most experience with community-based management of coastal resources, as well as the strongest set of supporting policies and laws.

These studies evaluated the ingredients identified by Ostrom (1990, 1994). As listed in Pomeroy, Katon and Harkes (1999), these are: 1. clearly defined boundaries; 2. clearly defined membership; 3. group cohesion; 4. existing organization; 5. positive net benefits from the member's viewpoint; 6. participation by those affected; 7. enforcement of management rules; 8. legal rights to organize; 9. community level cooperation and leadership; 11. decentralization and delegation of authority; and 12. coordination between government and community. Ingredients of "high importance" are numbers 1, 2, 5, 6,7, and 9. To illustrate: in San Salvador and in Malalison Island in the Philippines, the marine sanctuary was clearly demarcated with buoys. All members of the fisher organization were involved in making and changing the rules. NGOs tend to devote much time and effort in educating fishers about the benefits and costs of co-management. Co-management was more successful in communities where fishers had positive attitudes toward collective action, and where a strong local leadership was present.

Quantification of the benefits and costs of co-management are however sparse. Katon et. al. (1997) analyzed beneficiary perception of quality of life improvements in Cogtong Bay, Central Visayas. Co-management in this area began in 1989, when the national and municipal government, together with local fishers, established a regime of coastal resource management with the active participation of fisher associations. Co-management project was found to be successful in promoting positive and statistically significant changes in its performance indicators, except for the household income

indicator. Not surprisingly, the most significant changes were observed for indicators related to "empowerment".

As for the cost side, a study by Abdullah et. al. (1997) attempted to measure the transaction costs of a fishery co-management project. This study categorized transaction cost into *information, collective decision-making, and operational costs*. They arrive at the following figures (in pesos)

	Years 1-2	Years 3-4	Years 5-8
Co-management	1,547,272	1,113,250	1,200,200
Centralized management	446,895	467,542	2,830,847

The figures on centralized management are derived from key informant interviews and other studies. The total cost of centralized management is slightly lower than that of co-management (3.86 M pesos versus 3,74 M. pesos). However, the bulk of the transaction cost of co-management take the form of initial start-up costs. It may be conjectured that co-management more than compensates these initial costs by requiring lower outlays in later years. Enforcement costs may be later on lower, as community members are more likely to comply with rules formed under participation, than with rules that are externally imposed.

4.4. Research issues

The research issues for CPRs can be divided into three broad categories, namely: the link between property rights and environmental degradation; the transaction costs of establishing property rights; and the appropriate set of instruments, in combination with the property rights regime, for managing CPRs.

The link between conservation practices and tenurial security is well established. What is unclear is whether the promotion of formal individual rights, under conventional programs, contribute significantly to the control of environmental degradation. Of special concern is whether perverse incentives for land clearing and migration might be created by tenure programs.

Except for a few studies on fishery co-management, there are no estimates available regarding the benefits as well as costs of establishing property rights regimes. More work needs to be done in this area, especially in terms of evaluating and comparing alternative regimes. Emphasis should be both on generating concrete figures over time for particular cases, in order to obtain an idea about orders of magnitude, as well as how costs over time relate to the specific social and physical environment of the locality. An interesting hypothesis to guide research is that community-based management involves large initial investment but low recurring costs, compared to centralized management.

Finally, research should also examine further the appropriate combination of other interventions with the promotion of property rights. Consider pricing issues: a standard critique is that fees collected for logging concessions and commercial fishing licenses are too low to capture resource rents. The appropriate level and structure of fees, as well the system of fee setting, is yet to be specified. Further studies will be required to inform the appropriate *level* of fees and *process* of adjustment.

Increasing the role of markets in the tenure and access instruments is a controversial and poorly researched issue. As the Fisheries Code includes a very limited provision on market-based instruments, analysis of policies in this direction will be a valuable input to future legislation.

The devolution of oversight over the ISF Program as well as of municipal waters presents another important issue. While most observers approve of the general intent of the Local Government Code, research on the benefits of the changing of hands on uplands and coastal resource management is yet to be rigorously studied. As most recommendations center on improving the capacity of local governments to undertake the environmental protection, specific capacity-building proposals should be the output of research on governance.

5. CONCLUSION

The agriculture and natural resource sectors in the Philippines have undergone extensive property rights reforms, particularly from the late 1980s. Recent literature on property rights is replete with hypothesis, based on empirical evidence across countries and over time, regarding both favorable and unfavorable efficiency impacts of such reforms. Hypotheses on equity and sustainability are also covered under a dynamic definition of efficiency and the hypothesized links between efficiency and equity.

Unfortunately in the case of Philippine agriculture, much of these hypotheses remain to be convincingly established. Findings of past studies are mostly based on case studies, where applicability over the entire scope of reform is inconclusive. Greater effort should be directed to achieving wider generality. The nationwide studies for agrarian reform do not permit time-series comparisons. Nor do they address large swathes of reform coverage, such as occupants of public and government lands. Though opportunities have clearly been missed, there remains a rich potential for research as impacts are hypothesized to be observable in the long term. The very slowness of reform

implementation permits extended comparisons between beneficiaries and nonbeneficiaries, which is essential for any statistical analysis of causation.

While the literature has indeed burgeoned over time, the absence of concerted, systematic research aimed at gathering evidence, tracking changes over time, and testing hypothesis arising from a coherent framework is regrettable but not irreparable. By paying heed to what is known and not known about the impacts of property rights reform, hopefully this gap will be bridged by research work within this decade.

ENDNOTES

¹ The term is appropriated from incomplete contracts literature; see Grossman and Hart (1986), and Hart and Moore (1990).

² These are of course the two fundamental welfare theorems.

³ In a rural setting, linkages are conceptualized in a Keynesian type framework, and are quantified by computing localized multipliers. This approach however lacks microfoundations (as does the macromodel from which it derives) and its appropriateness for modeling *development* per se is suspect. See Briones (2000).

⁴ The equity-growth view is not without its detractors. In a recent article, Li and Zhou (1998) argue that, if public consumption goods are financed by a growth-reducing tax, then majority voting leads to a distortionary regime when inequality is low. A regression of GDP growth on past values of the Gini coefficient confirms the hypothesis.

⁵ Generous repayment terms are built into the CARL itself: "Should the scheduled annual payments after the fifth year exceed ten percent (10) of the annual gross production and the failure to produce accordingly is not due to the beneficiary's fault, the LBP may reduce the interest rate or reduce the principal obligation to make the payment affordable." (Chapter 7, Sect. 26).

⁶ At least for DAR-led programs, emphasis would have been towards ARCs, though at the household level many non-ARBs may have benefited from CARP support services.

⁷ Referred to as the Agrarian Reform Fund, this fund was created by Executive Order incorporated into the CARL, which designates the following as the fund sources: proceeds of privatization, recovery of ill-gotten wealth, disposition of government property abroad, foreign funds specially designated for the CARP, and government funds not otherwise appropriated.

⁸ If we extrapolate Balisacan's (1997) calculations to estimate the divergence between national poverty and poverty among agricultural-dependent households, we arrive at a closer figure (58.5%).

⁹ Of course, regression analysis does not establish causation per se, but can substantiate the magnitude of an assumed causation. Justification of the assumed causation requires appeal to principles or evidence other than the regression analysis itself.

¹⁰ An example of a pitfall in the use of these surveys can be is the report of Garilao (1998), which alleges that ARB income increased, by comparing average income of farmers from the Benchmark Survey (P 47,884) and that of the ARBs from the PMES 2 Survey (P 56,646). The comparison is obviously faulty given that only nominal incomes have been measured, and that any number of other factors may have led to an income change. In addition, it is difficult to compare households composed of affected farmers in a broad sense (Benchmark Survey) with agrarian reform beneficiaries in the narrow sense (PMES Survey).

¹¹ Communication with the DAR Management Information Service.

ANNEX

The Survey Frames of the Major Data Sets

The Benchmark Survey, covering crop year 1989-1990, was aimed at providing a basis of comparison for evaluating the progress of agrarian reform at the farm and household level. Over 8,000 households were drawn from 400 barangays out of 41 provinces having the highest proportions of lands subject to CARP. Sample selection was also stratified by ecological zone (*i.e.* upland, lowland, and coastal zones).

The Benchmark Survey of ARCs, like the Benchmark Survey, included both ARBs and non-ARBs among the respondents. Data pertains to crop year 1993-1994. This Survey covers 61 ARCs, with 3,656 respondents (approximately 60 each). Within each ARC, barangays are stratified by ecological zone when possible; furthermore, selection of ARBs and non-beneficiaries was done by proportional sampling.

The MODE Impact of Agrarian Reform survey (henceforth the MODE survey) consisted of interviews of a subset of respondents (around 1,500 in all) from the Benchmark survey. Its sampling design hewed closely to that of the Benchmark Survey. Unfortunately, the survey instrument diverged greatly from that used in the Benchmark survey, hence the usefulness of the MODE survey for longitudinal comparison is limited (personal communication with Prudencio Gordoncillo).

The sample design of PMES is also based on the Benchmark Survey, but its coverage is limited to ARBs under DAR jurisdiction. Phase 2 was a “pilot test” of the PMES in the form of a nationwide survey of 3,411 ARB respondents from 20 provinces. Selection of provinces applied island group stratification (Luzon, Visayas, and Mindanao) and size stratification (large and small provinces).

Meanwhile Phase 3 is yet to be finalized, although summary findings are available. This survey is distinguished by its validity for regional analysis, as well as inclusion of ARCs as a distinct domain. ARBs are first stratified in terms of residence or non-residence in an ARC. The selection of ARC barangays from each included province was based on categories of LAD accomplishment. For non-ARC residents, selection from each included province was based on a subset of municipalities, followed by a subset of barangays, and finally a subset of ARBs in the barangay.

Finally, the longitudinal study of Deininger et. al. (1999) utilized villages that had surveyed by the International Rice Research Institute as well as the International Food Policy Research Institute in 1985, 1989, and 1998. The 1989 survey was able to collect information on inheritances, assets, and the history of land transactions. Five villages were covered, two in Central Luzon and three in Panay island. In each area, the sample included one village with irrigated rice land and a favorable agroclimatic environment, as well as one village with rainfed production combined with supplemental irrigation. The fifth village (in Panay) has an unfavorable upland environment.

TABLES

**Table 1a. Accomplishments of land acquisition and distribution, by land type:
1972-December 1999**

Land type	Scope (Percentage of total)	Distributed (Percentage of scope)
Private land		
Tenanted rice and corn (P.D. 27)	7	87
Voluntary sale or transfer	8	100*
Compulsory acquisition	19	10
By size category (as of 1996)		
5 - 24 ha.	6	16
24 - 50 ha.	4	2
over 50 ha.	9	3
Total	37	53
Government-owned and public land		
Under DAR jurisdiction**	16	100*
Public alienable and disposable land	31	46
Integrated Social Forestry Areas	16	90
Total	63	73
Total lands (8,061,764 ha.)	100	65

* Actual distribution in excess of coverage

** Includes land owned by government financial institutions, KKK lands, settlements, and landed estates

SOURCE: PARC Secretariat

**Table 1b. Accomplishments of land acquisition and distribution, by region:
1972-December 1999**

Region	Percentage of total scope	Percentage distributed
Western Mindanao	4.4	103
Northern Mindanao	4.2	97
Cagayan Valley	7.0	95
CAR	1.8	89
CARAGA	4.7	85
Southern Mindanao	6.7	85
Central Luzon	9.2	84
Ilocos Region	3.3	80
Eastern Visayas	9.6	68
Central Mindanao	13.3	66
Southern Tagalog	9.0	63
Central Visayas	3.9	53
Western Visayas	13.0	45
Bicol Region	10.6	42
Total lands (8,061,764 ha.)	100	65

SOURCE: PARC Secretariat

Table 2. Accomplishments of CARP support services: 1987-July 1999

Support service component	Amount
Credit	
Loans released (P million)	82,290.5
Number of small farmers benefited	6,153,380
Infrastructure	
Completed roads (km)	5,639
Communal irrigation service (area, ha.)	67,380
Extension	
Number of farmers trained	2,767,348
Number of farmers provided technical assistance	1,739,457

SOURCE: PARC Secretariat

Table 3. Administrative costs of implementing CARP: 1987-1999

Item	Amount (P million)	Percentage of total
Landowner compensation	15,685	28.4
Other activities	5,690.7	10.3
Credit (LBP)	2,768	5.0
Infrastructure	6,707.1	12.1
Extension	2,056.9	3.7
Others	3,583.1	6.4
Personnel services	13,465.5	24.4
Other items	5,362.2	9.7
Total	55,318.5	100.0

SOURCE: PARC Secretariat

Table 4. Distribution of respondents' parcels by tenure by survey, in percent

	Benchmark 1989	ARC 1993	MODE 1995	PMES 1994	PMES 1996
Share tenant	25	9	26	3	7
Leaseholder	19	8	15	10	9
Owner	6	29	11	18	10
Owner-cultivator (awaiting certificate)	35	32	34.5	23	33
Landless worker	6	-	5.7	-	-
Others	8	22	14	38	35
Total	100	100	100	100	100

Table 4. Distribution of respondents by availment of support services by survey, in percent (Multiple responses)

Availment	PMES 1994	ARC 1993	MODE 1996
With assistance	67	42	-
Source of assistance			
DA	67	24.9	41.6
DAR	33	49.0	28.3
DENR	-	0.8	9.5
DPWH	31	0.3	-

Table 5. Crop yields of respondents by type of crop by survey, in tons/ha:

Crop	National average		PMES 1994	PMES 1996	MODE 1996
	1994	1996			
Rice	2.9	2.8	2.9	2.7	3.7
Corn	1.8	1.5	1.6	1.7	1.7
Copra (annual)	1.2	1.3	1.2	1.4	-

Table 6. Income, poverty, and income sources of respondents by survey

	ARC 1993	MODE 1996	PMES 1994	PMES 1996
Average income (pesos)	51,939	-	47,884	54,631
Proportion below line(%)	54.5	71.7	~ 60	62.8
Sources of income (%)				
Farm	46.6	43.0	47.9	42.8
Off-farm	8.9	4.9	5.5	2.7
Nonfarm	44.5	52.3	46.6	54.5

Table 7. Borrowing sources of respondents as a percent of all respondents, by survey (multiple responses)

Source	PMES 1994	PMES 1996	MODE 1996
Formal sources	9.1	13.5	-
Cooperative	6.9	7.6	6.4
Other formal sources	2.2	5.9	3.4
Informal sources	21.5	40.5	-
Traders	6.7	13.5	21
Input dealers	2.5	15.7	1.1
Moneylenders	6.9	6.5	5.5
Relatives and friends	5.3	15.7	11.4
Others	0.0	2.7	6.7

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