

Research Paper

COLLECTIVE RICE PRODUCTION IN FINCA BERMUDEZ:

Institutional Performance and Evolution
in the Dominican Agrarian Reform Sector

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Introduction

The collective farm model established by the Dominican agrarian reform is currently undergoing a series of transformations. In some areas of the country, where collective farms (or colectivos) have never operated profitably, there is pressure for reform as the collective model of production effectively collapses. In other areas, where colectivos have generally been profitable (producing relatively high incomes for collective farm members), the model is also under attack, and has on some farms been replaced de facto with a form of individualized production termed the asociativo model. The rice-growing regions of the Río Yaque del Norte irrigation zone are the prime areas where this latter sort of transformation has occurred.

This paper devotes itself to analysis of the collective farm model, aiming to discover problems and weaknesses of the model which motivate its transformation. Based on the experience of an individual colectivo, Finca Bermúdez, the pages which follow detail the functioning of a collective rice farm (which is still producing collectively), locating organizational problems within the collective production process and the colectivo's adaptation to them. The paper also tries to identify residual problems in the collective farm model. This paper forms part of a larger study of the autonomous transformation of the Dominican agrarian reform. Other parts of the larger study examine in detail the post-colectivo associative model and the evolution of smallholder agriculture to forms of cooperatively integrated production.

This study of the Dominican colectivo is divided into four sections. The first develops, from a theoretical perspective, the problems of effectively organizing resource allocation and use for collective production. The analysis in this section both provides a language for discussing the particular case under study and facilitates extension of lessons from this case to others. The second section locates Bermúdez within the universe of the Dominican reform and provides a description of the farm and the rationale for its selection as the case study. Section III of this paper discusses the case study proper, presenting both the abstract legal form of the colectivo and its implementation and evolution in Finca Bermúdez. The basic theme of this section is that Finca Bermúdez has developed a rather successful form of participatory self-management, modifying the original colectivo model to conform with scale diseconomies in the collective rice production process. Section IV, the fourth and final section, attempts to evaluate the stability of the modified collective model

currently in effect on Finca Bermúdez. Remaining problems, their apparent severity, and forces favoring further transformation of the colectivo are presented.

I. ISSUES IN THE COLLECTIVE MODEL

The challenge of organizing collective or cooperative activity is, on one hand, that the scale of operations requires joint action beyond the scope of individuals or single households, while, on the other, that joint activity is vulnerable to "free-rider" activities of members who take advantage of the benefits without full contribution of their own efforts.

One way of avoiding free-rider problems is to divide asentamientos into individual parcelas that produce and sell independently and whose holders are individually responsible for their own incomes. This of course ends collective activity and forgoes the economies of scale achievable by collective action. The desire of parceleros (as beneficiaries of the Dominican reform call themselves) to transform collective asentamientos into associative ones is a partial move in the direction of avoiding free-rider problems. However, the associative form still requires some collective action, and the issue of controlling the free-rider remains even if diminished.

Any form of organizing joint production relies on some combination of supervision and incentives to control and coordinate the effort of individual workers. A private firm, employing labor on a wage basis, relies primarily on supervision. Supervision, however, is not a simple matter. What concerns the supervisor is not just the presence of the worker and the observation that the worker is working (hours put in) but the rate and quality of work done (effort). The latter are not easily observable by the supervisor.

In general, supervision over wage labor (without any special incentives for workers) is most satisfactory where:

- 1) effort is easily observable;
- 2) labor is unskilled, acquisition of skills by previous experience is not important (thus no investment by the firm in training workers), substitutes are easily available; and
- 3) the authority of management to hire and fire workers is unlimited.

Where these conditions are not present, the firm has an incentive to retain workers. In such cases personnel management becomes important, with the firm interested in worker selection, training, evaluation, merit pay, and promotion, as well as in dealing with worker complaints and attempting to increase work satisfaction. Merit pay and promotion provide an incentive for greater effort as a quid pro quo for higher pay and promotion. Recognition for good work and enhancement of work satisfaction provide incentives for worker self-realization in better work, even if effort is costly to observe and supervision is weak.

The contrast between supervisory and personnel management devices can be summarized as follows. While supervision attempts to compel better work,

personnel policies attempt to increase worker incentive to "volunteer" better work.¹ Depending on circumstances, some mix of both kinds of management devices is used, with the ultimate sanction being the right of private management to dismiss workers.

Where the condition of easy observability of effort is not met, the firm can attempt to increase incentives to workers by payment on a piece-rate basis. Piece-rates decrease the tasks of supervision but do not eliminate them. Supervisors need no longer be concerned with the rate of work, but they do need to watch the quality of work. From the worker's point of view, piece-work brings uncertainties of earnings due to factors beyond the worker's control: shortages of raw materials, intermediate products or energy breakdowns in machinery, poor coordination between branches of production, as well as random differences in how productive one's work is from time to time. The greater such uncertainties, the more inclined workers are to demand that a portion of the payment be a fixed minimum, while only the remainder depend on the rate of output. However, such a modification of payment decreases the incentive effect of piece-rates. In addition, piece-work may create morale problems by enhancing competition between workers, and creating the fear that the most productive workers will make it possible for management to reduce piece-rates. While such "divide-and-rule" tactics may work to the short-run advantage of management, in the long run lack of cooperation between workers, antipathy to the firm, and even sabotage may offset whatever benefits piece-rates bring about.

Beyond the choice of worker-control devices, there are two additional institutional elements which affect the organization and productivity of work: the need for and the authority of management, and the nature of property rights in the enterprise.

The organization of workers into a production enterprise requires coordination of activities and clear decision-making about what needs to be done. It is the responsibility of management to provide supplies and machinery, assign workers to tasks, coordinate between workers performing tasks (division of labor), select properly trained people (or train them) for each task, etc. Also, clear decisions need to be made about what to produce, in what quantity, by what technology, with what date of completion, etc. All these decisions have to be implemented. In a private firm, the responsibility for making and implementing decisions is legally and unambiguously placed with the owners. They also enjoy unambiguous authority to hire and dismiss workers as needed to organize work effectively.

In the private firm, the structure of property rights gives the owner not only the power but also the incentive for efficient organization of work. Private property rights in a firm are rights to the residual income which remains

1. Volunteer is used here to denote a lack of supervisory compulsion, not altruistic behavior. Volunteered, better work is exchanged for the quid pro quo of expected promotion and higher income later in return for more productive work now, or recognition for good work and self-satisfaction from work as reward for better performance.)

after all costs, including wages, have been covered. Inefficiencies in the organization of work reduce residual income and make the assets of the firm, its working organization, and its access to markets an attractive buy to outsiders able to increase efficiency. Therefore, poor performance generates an incentive for the transfer of the firm to more efficient management or a dissolution of the firm and the release of workers and other resources to be absorbed in other, more efficient firms elsewhere in the economy.

The issues above are presented not because an asentamiento needs to be made similar to a private firm, but because the challenges of joint activity can be derived more clearly from a description of a private firm. From the above, the following principles of joint activity emerge:

- 1) Joint activity needs coordination and decision-making.
- 2) The authority to make and implement decisions needs to be clear.
- 3) The implementation of decisions needs to overcome free-rider tendencies of individuals through a combination of:
 - a. supervising workers,
 - b. providing workers with individual incentives for greater effort, and
 - c. increasing the voluntary commitment of workers to joint effort (voluntary does not mean altruistic).

All of the above needs are present in collective or associative enterprises. Realizing them may be more complicated than in the private firm, however.

In the Dominican colectivo, authority to make management decisions is ultimately derived from the consent of the parcelero members in votes of the general assembly. In relation to management, parceleros are both superior policymakers and subordinate workers. This double relation generates a challenge for collective enterprises to achieve clear authority for management decisions, and at the same time to maintain real, rather than only formal, participation of members in policymaking. Real participation in turn requires understanding of the issues facing management and of the rationale for the decisions that management has made. Simultaneously maintaining authority and real participation can clearly be difficult.

The private firm does not have this double relation between management and workers. The single relation of superior management and subordinate workers is clear and ultimately rests on management's unquestioned right to dismiss workers. Management in a collective does not have this given right. Instead, it must generate this "right" from member support of management and from management behavior which reassures members that good decisions are being made. This requires an effort to inform members about issues and reasons for decisions. Shared information can be a basis for both trust in management and a workable labor-management relation.

Without such a relation, management in a collective is not likely to be effective. Passive membership may give management a free hand, but a passive membership is not likely to work hard, and managers are not likely to have

sanctions as powerful as those of managers in private enterprise to compel greater effort. Distrustful membership ties the hands of management excessively and is not likely to result in good decision-making. With either relation, alienation of members results in an "us-versus-them" attitude to managers.

The problem of ambiguous authority in the collective can cripple the implementation of worker-control devices, including supervision and individual incentives useful for overcoming free-rider tendencies. As in private firms, the collective can rely on voluntary work commitment, as well as supervisory and incentive devices. Voluntary commitment to greater effort depends on member conviction that joint effort produces results superior to individual effort, and that the rewards to the individual member make worthwhile his own commitment to participate generously with his own effort. The nature of such commitment in a collective differs somewhat from that in private enterprise, as will be discussed below.

Despite the similarities of joint enterprises, whether collective or private, there is a difference in dominant interpersonal relations between enterprise types. To discuss this issue we will rely on the concepts used to distinguish patron-client from contractual, market relations. The former relations are multi-stranded, while the latter are single-stranded. The simplest kinds of single-stranded relations are those between a buyer and a seller meeting in a store or an open market. The only connection between them is the purchase and sale of a commodity, possibly never to be repeated again. There is no need to know anything else about each other except that the price of the product is not such as to make it advisable to deal with a different party.

The opposite extreme to a single-stranded market relation is a patron-client relation, such as that between a landowner and a campesino who obtains a parcel of land in exchange for some kind of payment in labor or services. In addition to the specific exchange of land for labor, the relation includes less specified, but expected calls to be made on the opposite party in case of need. The campesino may need patron assistance for extra help in event of sickness or poor yields, intercession with authorities to get children in school, or resolution of a dispute with police (what James Scott calls survival insurance). The patron expects the client to help out with seasonal work when needed, to run errands, to turn out to vote the way the patron indicates, and otherwise to support patron interests. A multi-stranded relation goes even further between immediate family members with the presumption that help will be available from other family members almost without limit within the availability of family resources.

Market relations or relations within a private firm are dominated by a single strand: an exchange of goods or services for price or a wage. But insofar as they are continuous or repeated, other elements (strands) may become important: the possibility of promotion or good treatment of workers is exchanged for greater effort, or a better deal is offered to assure continuous buying from the seller offering the deal. In various forms, favors are exchanged in addition to the basic transaction. In market transactions, however, the presumption is that the relations can be discontinued easily and there are no legal or social barriers to discontinuation. On the other hand, in multi-stranded relations, the presumption is that the relation will continue. Lapses

in performance are deviations from expected behavior and are socially sanctioned.

Multi-stranded relations are exchanges with a quid pro quo, but the benefits to each party do not occur simultaneously. They are not, however, long-term, or insurance, contracts. While they serve somewhat similar functions, they rely on different processes of implementation than contracts do. For example, the patron-client relation is an exchange of packages of goods and services provided by each party. But while a contract might have provided for an exchange of similar packages, it would have done so by specifying the content of each package and either the time of delivery (long-term contract) or the circumstances under which a service would be provided (insurance). In contrast, a multi-stranded, patron-client relation places the parties on call to each other and is open-ended in time and in the extent of services which may be requested. It is not, however, fully open-ended. There are some socially sanctioned criteria of what are reasonable limits to the services that one party can expect from the other. As is the case with friends who help each other with their work, "exchange" occurs on the expectation of a roughly similar return favor. Without an acceptable quid pro quo, one party is exploiting the friendship for its own benefit and this may bring the relation to an end.

Personnel management in private enterprise could be viewed as a case of multi-stranded relations. Improving conditions of work, recognition for good work, merit pay, and promotion attempt to create either a reward of self-satisfaction for greater effort or expectations that the enterprise will in the future reward better performance in the present. The criteria of better performance are open-ended rather than specifically defined, and the rewards are expectations rather than contracts. As in friendship, expectations can be disappointed, the relations need continuous reinforcement, and failure to meet expectations can result in termination of employment or deterioration of the general relation between employees and the enterprise.

The management of the internal workings of the asentamiento--i.e., deciding what work needs to be done and controlling labor discipline--depends in part on the emergence of adequate authority and on the ability of that authority to decide and control. It is here that the major difference between private and collective enterprise appears. In private enterprise, the authority is given, and, in controlling work discipline, the managers can rely on supervision or individual incentives, utilizing only single-stranded relations. Even, if as is usually the case, various personnel policies are used to encourage effort indirectly, the authority of management to design or change these policies is clear. Where the multiple strands of personnel management do not work out with specific individuals, private management maintains the right to terminate the relation.

The authority in collective production does not predate the supervision of labor. An effective and fair utilization of parcelero labor by the leaders reinforces authority, as ineffective direction of labor diminishes authority and decreases the ability of leaders to get good performance from members. In that sense the emergence of authority depends on the formation of multi-stranded relations within the asentamiento. Supervision of labor is necessarily a multi-stranded relation in the collective. Thus the emergence of

authority, and of the work discipline dependent on it, is a relatively more difficult task in collective production. That difficulty can be expected to increase as more functions are carried out jointly.

In a collective enterprise multi-stranded relations involve contribution by members to the organizational activity (leadership, committee work, and some administrative work) and approximate rather than precise equity in the relation between contribution of effort and benefit share. A common characteristic of all multi-stranded relations in both private and collective firms is their open-endedness and only approximate equivalence of costs and benefits. They are matters of rough justice rather than precise justice. They are therefore different from the strict equivalence in market transactions, in which a calculative mentality operates to compare the price offered by the opposite party with available alternative opportunities. And because contribution and reward are often not simultaneous, there are ample opportunities for free-riding--but repeated free-riding destroys the relation.

These considerations raise the issue of what the mechanisms and conditions are for stability of a multi-stranded relation. In general terms, they seem to be:

- 1) The benefits of utilizing multi-stranded relations are superior to reliance on single-stranded transactions. They could be rewarding because of higher incomes or greater security of income, or because of the satisfaction derived from participation in joint activity versus isolation in individual activity. Of course, in all of these respects the circumstances could be such that single-stranded activities would be more beneficial.
- 2) The members must accept the distribution of costs and benefits among themselves as sufficiently fair (rough justice) that individuals do not feel the need to calculate precisely whether they are losing by participating in multi-stranded activity.
- 3) Sustained failure to satisfy expectations leads to festering questions and doubts, alienation of members, passivity, joining in free-riding, or withdrawal from the group, terminating in breakdown of the group.
- 4) Mechanisms to prevent such a negative outcome include:
 - a) frequent airing of doubts, questions, and complaints;
 - b) re-evaluation of benefits of relations or joint activity, including adjustment in procedures and functions;
 - c) legitimation of relations or joint activities by support of trusted leaders or persons of authority if successful activities are reinforced as a matter of socially approved tradition.

The points listed in part 4 above are cumulative and reinforcing. In the case of joint activities, frequent airing of small issues increases understanding of problems and reasons for decisions, prevents frustration, and encourages participation. If small problems are resolved as they arise, it is easier to

concentrate on major issues as they arise and to make appropriate adjustments. And if the organization deals successfully with minor problems and major adjustments, then there is greater trust which gives the leadership greater autonomy to deal with smaller day-to-day issues without petty demands for explanations and review decisions in general meetings. On the other hand, the achievement by leaders of such autonomy carries the danger that members will become passive and ill-informed, which may make it difficult for the organization to face major new issues. In other words, success creates the dangers of taking joint activity for granted. To avoid this, lines of communication between the organization and its members must be kept open, even if need and interest in communication may be limited much of the time.

By way of summary, the following options seem to be available to direct and coordinate joint production:

- 1) If enforcement of work discipline is relatively easy and labor is unskilled and easily replaceable, then single-stranded relations with strict supervision can be used.
- 2) If enforcement of work discipline is more difficult, but the other conditions are similar to those above, then individual incentives may be used--provided, of course, that the nature of work is such that individual incentives can be designed (some form of piece-work). This also requires only single-stranded relations.
- 3) If some of the above conditions do not obtain, then some forms of multi-stranded relations need to be utilized.

The above options are, of course, not exclusive alternatives and can be combined. As emphasized throughout the discussion, successful implementation of any of these options in a collective firm requires special attention to a wide diffusion of information and participation.

II. INTRODUCTION TO FINCA BERMUDEZ AND COLLECTIVE RICE PRODUCTION IN THE REFORM SECTOR

The collective rice farm Bermúdez is located in the northwestern Province of Valverde, in the irrigation district of Río Yaque del Norte. This farm of approximately 257 hectares was selected for in-depth study of a collective rice farm. Interviews were conducted during July 1983 with members of Finca Bermúdez as well as with staff of the Instituto Agrario Dominicano (IAD) responsible for various aspects of Bermúdez's functioning. Interviews with farm members included both individual and small group discussions, as well as attendance at the regular meetings of the farm's general assembly. IAD informants included the regional collective farm supervisor of the Mao-Esperanza zone in which Finca Bermúdez is located, as well as the administrative and social affairs officers specifically assigned to Bermúdez. Efforts were made to corroborate information from one source with that from another. But there undoubtedly remain aspects of Bermúdez which we have misunderstood or about which we have failed to obtain complete information. This caveat applies particularly to

farmer income-producing activity outside collective production itself. Nonetheless, we are confident that we have obtained a sufficiently accurate portrait of Finca Bermúdez to permit discussion of the issues of interest.

Bermúdez began collective production as an agrarian reform asentamiento in 1974. It was founded as part of a second phase of agrarian reform initiated by the Dominican government in 1972. Prior to that time, the reform had affected some 71,000 hectares, assigning family-sized parcels to individual reform beneficiaries. In 1972, legislation was passed which required rice farm owners who had benefited from a state-financed irrigation project to sell holdings in excess of 31.4 hectares to the government. A second law, with higher ceilings, was applied to nonrice-producing latifundia. Land acquired under these laws was turned over to IAD for distribution as collective farms. In a speech before the national legislature, then-President Balaguer noted that these additional reform efforts were required by increasing political unrest in the countryside (Rodríguez-Núñez 1980:49). Indeed, prior to the reform land invasions had occurred in some of the rice areas, although members of Bermúdez report no such activity in their vicinity.

Between 1972 and 1977, 100 collective asentamientos were formed, primarily in the irrigation districts of Yuna-Camú and Yaque del Norte. Average size of these asentamientos was 36 members and 105 hectares. The rule of thumb followed by IAD in making land assignments was that there should be approximately 50 tareas of land (16 tareas = 1 hectare) for each individual assigned to the farm. Bermúdez, with 88 members and 4,108 tareas (257 hectares) of land, is quite a bit larger than most asentamientos formed in this period and, in fact, is the largest of the 18 collective rice farms in the Mao-Esperanza zone.

Selection of Bermúdez for in-depth analysis was based on two criteria. The first was that the selected farm function more or less as a collective--that is, that work be performed collectively rather than by individuals on parcelized subdivisions of collective land. As many collective farms have recently moved to some form of individual parcelization, this first criterion proved rather demanding. The second criterion was that the farm be "well run." The logic behind this was that a well-run colectivo would be more informative about organizational possibilities and limits than would a badly run farm. Problems in a well-run collective farm presumably apply a fortiori to badly run collectives. On the other hand, organizational devices which enhance performance in the well-run collective offer lessons of potential usefulness to other collectives. Consultation with the Mao-Esperanza office of IAD produced the selection of Finca Bermúdez as a well-run, collectively worked colectivo. The IAD representatives noted that Bermúdez had never shown a loss in its 9-1/2 years of operation.

The figures in table 1 give a somewhat more precise idea about the relative productivity of Bermúdez compared to the 17 other collective (or nominally collective) rice-producing farms in the Mao-Esperanza area. As can be seen, Bermúdez's production per tarea (measured in current RD\$) is generally above average. Since 1974 (the year in which Bermúdez began functioning as a colectivo), Bermúdez has been above average every year except 1977. The farm average productivity differential has been 6.6 percent over the eight years.

Table 1
Comparison of Annual Value of Rice Produced per Tarea
on Finca Bermúdez and the Mao-Esperanza Colectivos
(current RD\$)

Year	Finca Bermúdez	Average Productivity of Other Mao-Esperanza Colectivos ^a	Difference Between Bermúdez and Any Farm Productivity
1974	90.1	95.5	-5.7
1975	128.3	111.6	15.0
1976	124.6	116.6	6.9
1977	123.3	131.4	-5.9
1978	131.6	125.7	7.8
1979	135.6	125.7	7.9
1980	153.6	142.7	7.6
1981	162.1	153.6	5.5
1982	177.2	163.7	8.2

SOURCE: IAD Records.

^a There are 17 other colectivos in the Mao-Esperanza zone. The number of farms for which data were available in any year varied between 7 and 17.

Bermúdez has also been relatively well run in the sense that it has experienced less divisiveness than its neighboring farms. As selection of agrarian reform beneficiaries was sometimes based on political criteria, farms occasionally found themselves stocked with members who both lacked farm experience and were from distant parts of the country. Their inexperience, together with their external orientation, sometimes created significant problems. IAD informants noted that Bermúdez lacked a location which made it attractive to "political beneficiaries," and that it was assigned to a group composed largely of local agricultural workers. This factor is said to have contributed to the relative internal stability and group cohesiveness on Bermúdez.

A problem which has affected Bermúdez over the last few years has been the gradual loss of productive land because of poor drainage. A state-financed project is currently under way to correct this problem. Meanwhile, Bermúdez's

official land stock has dropped to 3,400 cultivable tareas of land (down from 4,108) for the years 1982 and 1983. Farm members report that their actual cultivable area is in fact below 3,400 tareas, further diminishing their income-earning possibilities.²

The figures in table 2 give an idea of per member labor requirements for rice production on Bermúdez. The figures reported there have been derived from existing microeconomic studies of rice production. All are based on in-depth surveys of the Spring 1981 rice crop. Assuming a ratio of 50 tareas per beneficiary, table 2 indicates that current agricultural practice requires between 33 and 80 days of work from each farm member over the 5 to 6 months of the spring crop season. As the figures indicate, both total labor input per 50 tareas and the share of that labor supplied by the beneficiary vary widely between institutional forms. Because of its technological level and organizational form, labor requirements on Bermúdez might be expected to conform to

Table 2
Labor Day Requirements For 50 Tareas of Spring Rice Production
under Different Modes of Production
(1 day = 8 hours)

Institutional Form	Beneficiary	Days Worked by Family Members	Hired Labor	Total
Smallholder beneficiary	32.8	12.7	164.7	199.2
Parcelized colectivo (asociativo)	42.2	20.3	38.8	101.3
Colectivo	79.7	0.0	20.15	99.9
Average	51.6	11.0	74.6	133.5

SOURCE: Elaborated from data reported in Melo López and Rosario Acevedo 1982, and Nuñez Jiménez and Méndez 1981.

2. IAD records only report gross farm size rather than cultivable area. Official yield figures are thus based downward. The farms themselves have little incentive to correct the overstatement of farm size as their lines of credit are based on official per-tarea calculations. The net result is that there is no central record of actual cultivable area. The effect of such errors on the figures in table 1 is indeterminate, depending on whether the proportion of Bermúdez devoted to roads, canals, and the like is above or below average.

that indicated for collective farms. But even with a labor input of 80 days per member, there is obviously a lot of slack time over the production cycle available to members for managerial and other activities.

In addition to the spring crop season (which runs from approximately January through June), there is a second rice season which begins in July and has a late fall harvest. There are two major agricultural options for second season (or "winter") rice. The first is to repeat the entire spring season production process, beginning with land preparation, seeding, etc. The second option, called retoño, involves leaving the rice stalks in place from the first harvest to sprout again and produce a second crop. In addition to the saving of land preparation and planting expenses, a retoño crop requires less fertilization and water.

Table 3 gives some basic data on seasonal production and retoño characteristics of the chief varieties sown on Bermúdez. As can be seen, yields are lower in the second (or winter) season. The traditional variety mingolo produces a good retoño, yielding up to 75 percent of spring season production. The variety tanioka is higher-yielding, but does not give a good retoño in the

Table 3
Technical and Economic Characteristics of
Mingola and Tanioka Rice Varieties

	MINGOLO		TANIOKA	
	Spring Planting	Retoño	Spring Planting	Winter Planting
Total cost (\$RD/tarea)	80.73	47.17	88.20	88.20
Intermediate input costs (\$RD/tarea)	24.30	13.29	31.47	31.47
Expected normal yield (kilo/tarea)	316.9	240.6	380.3	316.9
Total cost per kilo of rice	0.255	0.196	0.232	0.278
Intermediate input cost per kilo of rice	0.077	0.055	0.083	0.099

SOURCE: Production costs figures are based on those used by the Banco Agrícola in 1983 to calculate working capital needs. Reported figures are total costs (including the imputed value of the farmer's own labor), not just those costs financed by the bank. Mingolo yield figures are from Cuevas-Perez and Nuñez-Jiménez (1981). The tanioka yields are based on estimates of the relation between mingolo and tanioka yields from Franz Doorman (personal communication).

Mao-Esperanza zone. Bermúdez plants the traditional mingolo on land where it expects to do a retoño, and otherwise plants two seasons of tanioka. As will be discussed later, a major allocational decision for the farm is the choice between mingolo and tanioka varieties. Farm members sometimes favor mingolo for economic reasons (arguing that its lower yields are offset by lower costs), while IAD often pushes tanioka toward its goal of increasing national rice production. The figures in table 3 yield almost identical profits per tarea when output is valued at the 1983 price of about \$RD.34 per kilo.

As a final introduction to the case study of Finca Bermúdez, table 4 presents some statistics on the changing economic environment faced by Bermúdez since 1974. As can be seen, the rice price paid to the producer has risen 22 percent since 1977, while an index of intermediate input prices has risen 40 percent. Consumer prices over this period have risen 100 percent. These changing relative prices suggest that, other things being equal, rice production has become less profitable over the years since Bermúdez began working as a collective farm. Capallan and Reynoso's (1982) study of the impact of

Table 4
External Economic Conditions

Year	Producer Price of Rice		Intermediate Input Price Index		Terms of Trade	Consumer Price Index	
	\$RD	% change	1976=100	% change		1978=100	1974=100
1974	22.95	-	-	-	-	100.0	-
1975	25.11	9.4	-	-	-	114.5	14.5
1976	24.60	-2.0	-	-	-	123.5	7.8
1977	26.70	8.5	-	-	-	139.3	12.8
1978	27.38	2.5	1.00	-	1.00	149.2	7.1
1979	24.05	-12.2	1.04	4.0	0.84	162.9	9.2
1980	28.00	16.0	1.08	3.8	0.94	190.2	16.8
1981	28.50	1.8	1.22	13.0	0.85	204.5	7.5
1982	30.25	6.1	1.29	5.7	0.85	220.3	7.7
1983	33.50	10.7	1.40	8.5	0.87	-	-

SOURCE: Rice-prices data are from government statistics for price paid to farmers. The intermediate input price index is based on seed, fertilizer, and pesticide used by the Banco Agrícola to calculate working capital needs. The terms-of-trade index relates rice prices to intermediate input prices. The consumer price index is from official government sources.

government price policy on rice production and consumption estimates that relatively low producer rice prices (compared to the world level) have diminished production levels. For collective producers, the potential impact of relatively low output prices includes not only the supply response discussed by Capallan and Reynoso, but also the diminution of returns to collective labor and destruction of the somewhat fragile devices of successful collective management. The impact of changing external conditions on the effectiveness of collective management and production will be discussed in section III. One very clear lesson from the Soviet experience with collective agriculture is that it is almost impossible to obtain collective work attendance and effort if the returns to collective work are minimal, regardless of the severity of disciplinary and legal sanctions.

III. ORGANIZATION AND EVOLUTION OF COLLECTIVE RICE PRODUCTION ON FINCA BERMUDEZ

Agrarian reform *colectivos* in the Dominican Republic are under the legal domain of a set of laws and regulations which mandate a simple structure of collective production and remuneration. As mentioned earlier, many *colectivos* have de facto made major changes in that structure and, strictly speaking, are operating illegally. Finca Bermúdez, however, still maintains an organizational structure that is within the confines of the law. Nonetheless, within those limits, Bermúdez has over time introduced organizational changes designed to improve collective production. This section first reviews the basic legal structure of the collective *asentamiento* and then traces its relatively successful implementation and adaptation in the case of Finca Bermúdez.

A. Legal Structure of the Colectivo

Perhaps the most striking feature of the Dominican collective farm model is the prominence it gives to IAD. As mentioned in section II, expropriated rice lands pass to IAD for the selection and assignment of beneficiaries. IAD is also legally given a prominent role in the actual administration of the farm. The basic enabling legislation (Ley 391, promulgated Sept. 1972) states that beneficiaries work "under the direction and administration of IAD." IAD's power and responsibility are embodied in each farm's administrative council. The council is the legal representative of the *colectivo*, empowered to make contracts, impose disciplinary sanctions, etc. The administrative council is composed of three members: an IAD administrator assigned to the *colectivo* (and who presides over the council), an appointed representative of the executive branch of the national government, and an elected representative of the beneficiaries.

Given this preponderance of nonfarm members in its executive body, the *colectivo* cannot be strictly labeled a self-managed enterprise. Yet the *colectivo* model does contain elements of self-management. The structure of the *colectivo* model can perhaps be best clarified by reviewing the specific division of rights and powers between the beneficiaries and IAD.

The administrative council has the power to recommend to IAD the removal of farm members who fail to fulfill the responsibilities of a reform beneficiario as outlined in the original agrarian reform legislation (Ley 5879 of

April 1962) or who otherwise disrupt the harmony and progress of the farm as determined by the administrative council. The power to revoke a reform beneficiary's rights in the colectivo belongs legally to IAD, as prescribed in the original agrarian reform legislation. According to the law of colectivos, IAD is required to consult (in the form of a vote) the members about revoking a beneficiary's rights. However, the final decision remains IAD's.

This control of IAD over farm membership gives some idea of the effective property right held by colectivo beneficiaries. That right is essentially one of conditional access to collective work (with the rights to collective income discussed below), with specific prohibition against capitalization of that "collective usufruct" right (Ley 391 and Ley 145, of November 1974, which strengthen the prohibition). The beneficiary does possess a right of heritability. In the event of the beneficiary's death, IAD is required to offer the beneficiary's rights to his descendants. In the event that the beneficiary has no descendants, or that they do not want the beneficiary's rights, IAD has the power to assign those rights to a new individual in accordance with IAD's desires and criteria. IAD's unilateral legal power to select beneficiaries also applies in the case where a beneficiary's rights are revoked.

In addition to being liable to IAD's administration, and to disciplinary sanctions which the administrative council might see fit to impose, the beneficiary is also liable to the council's power to replace him with a "substitute" should he prove himself "morally" or physically unfit for collective rice production. Substitution is a less drastic step than revocation, but it involves a loss of income (to pay the substitute), as is discussed below.

This specific constellation of rights, duties, and liabilities of the colectivo beneficiary has caused some to characterize beneficiaries as nothing more than employees on a state farm. Whatever the merits of that characterization, it is incorrect in terms of the beneficiary's position as claimant on residual income produced by the colectivo. The original colectivo legislation simply stipulates that residual income be distributed "equitably" among farm members. As implemented by IAD, this has meant a division of residual income to members according to days worked by each. Residual income is divided by total days worked by farm members, establishing the value of a work-day. Multiplying this value times days worked by a beneficiary establishes his share of residual income.

Payment of residual income shares is handled by the Banco Agrícola. Farm rice sales pass through the government marketing and price control agency (INESPRE), which then remits gross income to the bank. After deducting the amount of outstanding working capital and payments for any long-term loans, the Banco Agrícola apportions out net income to individual beneficiaries using the formula indicated above.³

This payment system requires some accounting of days worked (or days not worked). This function was initially assigned to the "capataz del campo," an

3. This system guarantees the very high loan repayment rate (90 percent) which collective rice farms have achieved.

IAD employee who serves as the IAD administrator's day-to-day representative on the farm. This accounting system and its associated system of financial penalties for days not worked establish incentives for labor supply. In addition to the aforementioned power of the administrative council to impose disciplinary sanctions, the only other provision in the colectivo model for work incentives or discipline is the requirement that the beneficiaries elect (in accordance with IAD) a "capable, hardworking and honest" fellow member for the task of insuring that everyone works hard in all stages of colectivo operations. In this sense, while establishing a relatively simple structure, the enabling legislation and regulations of the colectivo model did not propose a multifaceted supervisory or incentive structure which could be differentially implemented at different stages of the production process (e.g., use of piece-rates [paid, perhaps, in work points] when individual labor inputs are hard to measure and individual outputs are easy to measure, and use of time-rates with supervision when individual outputs are hard to measure). Instead it established a uniform time-rate system, which is subject to free-rider problems to the extent that supervision is inadequate to measure work attendance or work effort.

Hierarchically beneath the administrative council, and charged with implementing specific areas' colectivo policy, are six committees composed of colectivo members. The committees are Social Affairs, Purchasing, Production, Credit, Marketing, and Discipline. Throughout the production process, these committees are supposed to oversee day-to-day operations within their line of responsibility. The marketing committee is charged with selling the farm's produce, the credit committee with making necessary bank applications and withdrawals, etc. In all these areas, the precise responsibility of the committee versus the responsibility of the administrative council and the IAD administrator does not appear to be legally well-defined. But practically, given the relatively small size of the farms and the assignment of each individual IAD administrator to 5-10 different farms, the committees exercise a significant degree of day-to-day responsibility. At this level, the colectivo model contains significant features of self-management.

Because of this lack of significant on-farm, nonmember administrative structure, the Dominican colectivos are distinct from, for example, the collective farms established by the Peruvian agrarian reform. In Peru, the larger size of the reform farms justified an on-farm professional administrative structure. At its worst in Peru, this arrangement led to both a crippling of effective participatory self-management, and a crippling of professional managerial initiative as managers served at the (sometimes whimsical) discretion of the general assembly. We will later study in detail the effective disposition of managerial responsibility on the Dominican Finca Bermúdez, and relations between managers and members.

In addition to rights of income and work, the Dominican colectivo model also established an informal insurance system. The system offers three types of insurance: family income and subsistence insurance, old age insurance, and disability insurance. Subsistence insurance results from the provision in the colectivo's working capital loan of a daily subsistence payment to each beneficiary. Subsistence is paid every 15 days (currently at a rate of RD\$3 a day, or RD\$45 every 15 days) over any cropping period financed by the Banco

Agrícola. In the event that residual income is insufficient to cover these advance subsistence payments, the individual has at least been guaranteed a return of RD\$3 a day for collective work. (Subsistence payments not repaid out of residual income become the collective debt of the enterprise to the bank and are liable to repayment.) Distribution rules in the colectivo system create a second form of income insurance. Because individuals share in the production of the entire extension of the farm, they are not individually subject to the risk of a "microcrop failure" on any particular 50 tareas of land. In this sense, individuals receive a form of crop insurance not available to the small farmer. By avoiding the individual debt that a microcrop failure would bring to the small farmer, the colectivo member also enjoys a greater security of tenure.

Disability and old age insurance come from the substitute system on the colectivo. Individuals unable for reasons of health or old age to work are permitted to keep their rights. They must, however, pay a substitute to do their work. The specific form of this payment in the case of Bermúdez will be discussed below. But, in general, the substitute system guarantees income for the old and the infirm.

As with most insurance, that provided by the colectivo is subject to "moral hazard"--i.e., subject to the risk that the provision of insurance will negatively affect incentives and individual behavior. In the colectivo system, disability insurance, for example, may increase the probability that an individual will become sick (through excessive drinking, for example), or will say that he or she is sick. Insurance against microcrop failure also insures the individual against "micro-effort" failure if informational and supervisory devices are weak or costly enough that those providing minimal work effort are not detected and penalized. This trade-off between risk-sharing insurance and incentives will be discussed in greater detail later.

In summary, the Dominican colectivo model granted limited property rights to the individual beneficiary, legally allocating substantial power, rights, and responsibility to IAD. At the same time, the assignment of each IAD administrator to many farms ipso facto guaranteed that much day-to-day management and supervision would have to come from the beneficiaries themselves. Together with the relatively uncomplicated and vulnerable (to free-riding and moral hazard) supervisory structure which was created, this de facto self-management necessitated that some further transformation (or degeneration) of the collective farm was necessary. We turn now to consider how Finca Bermúdez has dealt with these contingencies and created a relatively successful system of collective production.

B. Implementation and Adaptation of the Colectivo Model on Finca Bermúdez

Using information derived from the case study interviews, this subsection explains how the colectivo model has been implemented in Bermúdez, stressing modifications which have been made to the basic model. It also attempts to identify continuing organizational problem areas. Part 1 outlines resource allocation decision-making on Bermúdez and highlights external relations of the farm with both IAD and other agencies. It is argued in this part that some of Bermúdez's relative success is based on its rather high degree of member

Table 5
Economic Performance on Finca Bermúdez: 1974-1984

Year	Season	Cultivated Land (tareas)		Production		Gross Residual Income (\$RD)	Use of Approved Credit (%)	Per Member Income from Collective Work real ^a		
		mingolo	tanioka	fanegas (100 k)	value (\$RD)			seasonal	annual	annual
1974	spring	-	-	10,978	246,001	166,088	-	1,887		
	winter	-	-	5,153	124,225	52,950	-	601	2,489	2,489
1975	spring	-	-	12,970	346,997	214,409	-	2,436		
	winter	-	-	6,790	175,059	98,771	-	1,122	3,559	3,109
1976	spring	-	-	14,171	351,983	216,151	-	2,456		
	winter	-	-	6,394	159,846	102,417	-	1,167	3,620	2,924
1977	spring	-	-	14,652	387,731	254,556	-	2,893		
	winter	-	-	4,750	116,943	72,934	-	829	3,722	2,671.7
1978	spring	1,785	2,232	11,390	287,554	156,955	-	1,785		
	winter	1,785	2,323	10,544	253,064	149,157	80	1,699	3,478	2,331
1979 ^b	spring	0	4,108	11,000	274,845	113,125	80	1,286		
	winter	1,000	3,108	9,546	244,327	126,905	71	1,442	2,728	1,674
1980	spring	1,000	3,108	12,669	367,199	216,026	86	2,455		
	winter	1,000	3,108	7,787	220,639	131,761	58	1,497	3,952	2,078

[continued]

[Table 5, Economic Performance, cont.]

Year	Season	Cultivated Land (tareas)		Production		Gross Residual Income (\$RD)	Use of Approved Credit (%)	Per Member Income from Collective Work		
		mingolo	tanioka	fanegas (100 k)	value (\$RD)			seasonal	annual	real ^a annual
1981	spring	2,108	2,000	12,481	352,623	178,523	61	2,029		
	winter	2,108	2,000	6,219	187,004	109,338	36	1,243	3,271	1,600
1982 ^c	spring	2,300	1,000	11,910	431,780	249,075	69	2,830		
	winter	2,300	1,000	7,484	217,322	177,532	49	4,847	2,200	
1983 ^d	spring A	700	1,000	-	-	-	-	-		
	B	1,700	0	-	-	-	-	-		
	winter A	700	1,000	-	-	-	-	-		
	B	1,700	0	-	-	-	-	-		
1984	spring A	0	1,700	-	-	-	-	-		
	B	0	1,700	-	-	-	-	-		
	winter A	0	1,700	-	-	-	-	-		
	B	0	1,700	-	-	-	-	-		

NOTES: a Real annual income is derived by deflating nominal income with the official consumer price index given in table 4.

b Hurricane David diminished crop production in 1979.

c The decline in land stock is the result of drainage problems.

d Beginning with 1983, Bermúdez split into parts (A and B) of equal size.

- Indicates data not available.

participation and on the respect shown by local IAD functionaries toward self-management and its rigors.

Part 2 discusses resource utilization, or internal management, on Bermúdez. The basic structure of discipline and incentives specified by the colectivo model has apparently proved inadequate, motivating further organizational modifications. Part 3 presents some issues in the family economic strategies of beneficiaries, specifically discussing income and insurance aspects. Finally, part 4 discusses recently implemented organizational changes in Bermúdez in terms of their impact on managerial information and costs and on worker incentives.

1) Resource Allocation and Management of External Relations on Finca Bermúdez

A December meeting of the general assembly of all colectivo members officially establishes the coming year's production plan on Finca Bermúdez. As mentioned in section II, a major decision made at this time is the choice between varieties--specifically the allocation of land between the higher yielding variety tanioka and the local variety mingolo, which can be left after the first harvest to yield a good retoño (ratoon) crop in the winter season. The figures presented in table 5 show the evolution of Bermúdez's cropping pattern from 1974 through 1984. Some idea of the way cropping decisions are actually made can be learned from the fact that by the July 1983 interview period, the 1984 cropping pattern had already been selected.

The plan to cultivate only tanioka in 1984 (see table 5) was reported independently by a number of Bermúdez colectivo members. The reason given for this departure from the recent pattern of an approximately 2:1 ratio of mingolo to tanioka was the "degeneration" of the mingolo variety. The spring 1983 harvest was particularly plagued by lodging of the tall-stalked mingolo variety. When this happens, mechanical harvesting becomes difficult and some manual harvesting is needed. In addition, the quality (and price) of the rice grains deteriorates.

Besides the explanation of varietal degeneration for the decision to alter cropping patterns, there is an institutional explanation (related to recent changes in work organization) which is to be discussed below in part 4. In terms of collective farm management, an interesting aspect of this decision to change varieties is the degree to which all farm members seemed to be informed. Report of the new cropping pattern came not only from the colectivo leadership, but also from members without any special standing in the colectivo. This dispersion of information, and the fact that a decision has effectively been made months in advance of the official annual plan assembly meeting, indicates substantial informal discussion among members about collective plans and problems. While it was not possible to observe what consensus-building process had been in action, Bermúdez apparently enjoys a high degree of participation. Other studies of collective production have noted the importance of informal participation and discussion for the maintenance of what we have called "strands" of social obligation. The economically successful Hutterite communes and Israeli kibbutzim both foster informal discussion and participation. These items seem to be a necessary prelude to effective formal participatory decision-making.

Without them, members tend to be overwhelmed by the logic of "technical necessity" presented in formal meetings. Without effective understanding and participation, member alienation and degeneration of collective bonds are a danger.

The effectiveness of member participation in Bermúdez is further enhanced by the particular relationship currently enjoyed with local IAD representatives. In private conversation, the IAD officials indicated some skepticism about the quality of (self-) management on the colectivos and expressed some unhappiness about the beneficiaries' apparent preference to do retoños rather than second plantings. (The local IAD office currently works under a national rice plan designed to achieve self-sufficiency in rice. Their annual operating plan requires them to obtain an average annual yield of about 350 kilos of paddy rice per tarea of agrarian reform rice land.) Yet despite the IAD officials' disagreement with farm members' allocational preferences and their sense of their (IAD's) superior technical knowledge, they are not willing or able to impose their preferred cropping mix on the farm. In the regular general assembly meeting which we attended (where IAD officials were present as a matter of course), the IAD officials seemed to treat the beneficiaries, and the process of member participation, with respect. We were told that annual production plan meetings can be stormy, and that in some cases the IAD farm administrator attends with "reinforcements" to keep from being overwhelmed by strongly argued beneficiary preferences. Nonetheless, farm members told us privately that "we [the beneficiaries] always win" the annual land allocation battle with IAD. If anything, the farmers seemed to treat IAD's participation with a certain amount of disdain--as if it were something that had to be put up with and overcome. Regardless of the literal truth of the beneficiaries' view of the process, it does indicate a very real sense of worker self-management over a decision which is important for both the national and members' economies.

It is the process of participation, rather than some abstract allocation of decision-making power between members and outside technical personnel, that counts most for the success of collective production. It probably makes little difference that the IAD officials view Bermúdez's 1984 crop plan as an indication that they (IAD) have finally won, while the beneficiaries make no mention of IAD's perspective in their discussion of the same plan. From the beneficiaries' point of view, it is their decision and their plan. They, not IAD, determine cropping patterns. In the eyes of the beneficiaries, IAD's real usefulness in the resource allocation process is as a broker with other external agencies. (Part 2 will discuss IAD's role in the realm of internal worker discipline and management.) IAD, for example, helps the farm in its dealings with the Banco Agrícola. The credit office in IAD also maintains the accounting for credit disbursement and use. Because of some minor discrepancies between the IAD accounts and the bank's records, there was some general assembly discussion of the need for Bermúdez to keep its own set of books. However, at the present moment, the likelihood of independent accounting on the farm seems unlikely.

The current level of participatory self-management on Bermúdez has apparently not existed since the foundation of the colectivo in 1974. The first IAD administrator of the farm is remembered as being both dishonest and something of a bully. Colectivo members tell of the administrator taking fertilizer from

the farm for his own use and making beneficiaries cut down trees for him. Members were bullied with the threat that they would be "canceled" (i.e., have their rights revoked and kicked off the farm) if they did not do as the administrator wished. When a commission from the capital came to Bermúdez, only a few farm members were given permission (by the administrator) to talk, and they were told what to say.

Bermúdez members report an improvement in their level of participation and control starting around 1978. They attribute the change in part to the assignment of a "social promoter" (an IAD position) to the farm. The promoter is credited with informing them of their legal rights vis-à-vis capricious dismissal by IAD administrators. The year 1978 also saw the election of the Partido Revolucionario Dominicana (PRD) at the national level. PRD election rhetoric included the promise of greater participation to reform beneficiaries. In fact, the PRD victory over Belaguer has led to a general opening up of Dominican society in a number of areas. It seems likely that national policy changes had some positive impact on participation on Bermúdez, although one farm member specifically denied that the PRD had anything to do with the improved situation.

Among the members of Bermúdez, there is a definite group of leaders. Of the twelve individuals currently holding the top positions within the colectivo committee structure, eight held important posts in 1978-79. All of the very top leadership from 1978-79 currently occupy top positions--the only exceptions being those who have either died or otherwise left the colectivo. IAD officials unanimously agreed that there is one individual who is the leader at Finca Bermúdez. Unlike some of the leaders in Rincon-La Vega, who seem like somewhat flashy políticos (perhaps seasoned by their years spent advocating the "asociativo" model before the government), the Bermúdez leader is a relatively quiet, unassuming man. At the same time, he reveals in conversation detailed knowledge of what is happening on the farm, and IAD reports that he has the confidence and trust of the Bermúdez beneficiaries. The presence of such a natural leader is credited by local IAD officials as explaining Bermúdez's success as a colectivo. As mentioned in section II above, Bermúdez's experience in this respect contrasts with other local farms which have suffered from internal divisiveness and a lack of leadership.

The role of the trusted leader, who can speak with authority and mediate disputes, seems to be an important one in the successful cooperative. Bennett (1967) describes the religious elder in Hutterite communes as playing the role of trusted leader and thereby contributing significantly to commune success. In the Hutterite communes, the elder/leader derives his authority from his religious position. In that sense, the Hutterites have an extant social structure which can "manufacture" leaders, or at least create obedience and loyalty to the person occupying the leadership position.

Unfortunately, a secular agrarian reform colectivo, which is not built on an existing community structure, does not necessarily enjoy such "naturally" produced leadership. Nor does it have "natural" devices for creating strands of obedience and loyalty. Given these relative organizational weaknesses of the secular Dominican colectivos, it is important to ask whether a collective can function effectively without the guidance of a natural leader and the

strands of obedience which he or she generates. Perhaps well-instituted democratic processes can substitute for natural leaders or contribute to their creation. In any event, we cannot answer the general question here. We can only report that Finca Bermúdez enjoys the services of a natural leader and that he apparently contributes to that farm's success.

A final area of resource allocation, in which the interplay between external technical personnel, colectivo leaders, and individual beneficiaries is potentially important, is long-run investment decision-making. The Banco Agrícola of the Dominican Republic facilitates collective investment by extending loans for 100 percent of machinery costs. These loans are paid back over time, with the appropriate deductions made directly from gross collective income prior to remission of residual income to the farm. Because this procedure does not require a down payment (and hence any decision to sacrifice a large portion of current income for future returns), it avoids many of the "classical" problems of self-financed collective investment discussed by Vanek (1975). It also removes from the farm the necessity of haggling over the yearly contribution to a collective investment fund. Instead, the farm decides to buy machinery and the bank begins automatically to deduct payment only after returns from using the machinery have begun flowing in.

In the case of Finca Bermúdez, no particularly interesting information was obtained about the decision-making which underlay their recent tractor purchases. Perhaps the lack of anything notable indicates the degree to which the Banco Agrícola loan process has simplified matters.

The picture which emerges of the management resource allocation and external relations on Finca Bermúdez is one of a basically self-managed process. Participation and knowledge on the part of individual members seem high, although there is an identifiable leadership cadre. The current self-managed environment has only developed in the last six of the colectivo's ten years of operation. Initially, IAD played a dominant (and domineering) role in the operation of the firm, but now it is much more of a technical consultant and provider of services whose efficient scale exceeds that of Bermúdez (e.g., services such as accounting and pressuring of other government agencies). As one Bermúdez beneficiary put it, "They [IAD] do the office work, but we [of Finca Bermúdez] are the criollos who are responsible."

2) Internal Management and Organization of the Work Process

The chichigüao is a bird which descends in great flocks onto newly sown rice fields. It is also the name applied by the local community to colectivo members of Finca Bermúdez. Work in Finca Bermúdez has traditionally been performed by large groups of workers who descend onto the rice fields en masse, like chichigüaos.⁴ The aim of this section is to describe the forms of incentives and supervision which have been used with some apparent success to manage the collective work process.

4. At the present moment, mid-1983, this form of organizing work is in the process of change, as will be discussed below. This part of the report will only discuss the more traditional work patterns.

Manual operations on Bermúdez are divided between those performed collectively by the beneficiaries themselves and those performed by hired labor. Hired labor is used mainly for transplanting and for some manual weeding. Payment for both of these operations is made in the form of piece-rates (in 1983, RD\$10/tarea for transplanting and RD\$5.50/tarea for weeding). Specific colectivo members are assigned the task of checking the quality of work done by hired labor. In the transplanting operation we observed, the assigned supervisor was very active, moving throughout the field, making sure that plants were not wasted and that plant density was correct.

When transplanting quality is low (as happened when we were conducting an interview), the offending transplanter is paid for work completed and immediately dismissed. Bermúdez members report that they frequently fire piece-rate laborers for low-quality work. In an earlier conversation, we had been told that because they had themselves worked piece-rate before the agrarian reform, colectivo members were aware of all the tricks for subverting a piece-rate system and were therefore effective managers of hired labor.

Some piece-rate work is actually done by colectivo members (anxious for extra earnings) in afternoons after they finish their share of the day's collective work. In such cases, members are paid exactly like outside hired labor. Apparently this is not too common a practice, although much of the piece-work is performed by family members, as is discussed below in part 3.

In Finca Bermúdez the actual assignment of collective work tasks is handled by the Production Committee. There exists a definite division of labor, with certain people considered to be specialists in particular tasks. For example, we were given information on the following day's work assignment for the 44 beneficiaries who work the section of Finca Bermúdez called "Bermúdez-A." Three individuals were to work that day as irrigators (a specialized task for which the three are judged to be qualified); two were scheduled to go to the Banco Agrícola to straighten out a discrepancy in the farm's account; four were designated to supervise transplanting by hired labor; one person was scheduled to work in the storeroom where seed, fertilizer, etc., are kept; one was to plow fields with the tractor; twenty-eight were to work at leveling the fields in preparation for transplanting; and five people were officially registered as sick and unable to work in the flooded fields. In addition to the skill divisions indicated by these assignments, there are also individuals specially designated for the manual application of fertilizers, seeding, etc., when these tasks need to be done.

Management of the actual quantity and quality of individual participation in collective work proceeds in stages. The first stage is referred to as "passing the list." "The list" is a notebook with each beneficiary's name and a place for entering his or her presence or absence from each day's work. The notebook is maintained by a member of the production committee called the listero. It is the listero's responsibility each morning to note who is at work, who has an excused absence, and who is simply absent from collective work. The penalty for an unexcused absence is loss of the day's subsistence payment plus loss of a day's share of residual income. The total monetary loss is variable, but tends to be around RD\$12. The amount would actually be greater if compensation were calculated on a denominator of work-days (i.e., 5-1/2 days

per week), rather than total days (7 per week). As it is, no one ever loses credit for Sundays and other holidays.

While changing denominators would marginally increase the cost of a day's absence, the major problem with the listero system is the determination of excused (paid) absences versus unexcused absences. The actual decision to apply monetary sanctions to absences is made in the regular general assembly meetings conducted every 15 days. Colectivo members consistently complained about individuals claiming to be sick when in fact they are not (or when their illness is induced by rum consumption the night before). When asked why not simply dock everyone's pay who is absent, regardless of excuse, beneficiaries replied that such a scheme would be "inhumane." They clearly appreciate the health insurance aspects of the system, but at the same time complain of what we have termed the moral hazard problem (see p. 17 above).

The difficulties in implementing the listero system are really two. The first is an informational problem, and the second is a lack of institutionalized authority. The information problem is simply that of determining whether an individual is really sick. Bermúdez members joke about dragging laggard members out of their houses to see a doctor. More seriously, they also related the case of an individual who they thought was faking an illness. After they dragged him out to work, his health deteriorated and he died five days later. Clearly informational costs can be significant.

The bigger problem, however, seems to be one of a lack of institutionalized, depersonalized authority. Bermúdez members all live in a single government housing project and seem to know each other's affairs in detail. While this eases information costs, it makes imposition of sanctions difficult. Numerous individuals complained of the difficulty of voting to sanction their friends and neighbors. Because the sanctions are not automatic (largely because of the necessity of judging the validity of a beneficiary's excuse), they are not treated at an arm's length to neutral enforcement of rules. Instead, colectivo members worry about hard feelings, retaliation, and the negative impact of income loss on the beneficiary's wife and children.

The frequency with which sanctions are applied can be obtained from the end-of-season records of residual income shares and subsistence payments. Unfortunately, we were only able to find records for the Spring 1977 and Winter 1978 seasons. Table 6 summarizes the days credited to beneficiaries for

Table 6
Days Worked, Finca Bermúdez

Season	Mean	Standard Deviation	Maximum	Minimum	Mode
Spring 1977	206.9	1.64	208	194.5	207.5 (n = 57)
Winter 1978	104.8	0.50	105	102	105 (n = 73)

those two seasons. As can be seen, there is very little deviation (the coefficient of variation equals 8 percent and 4.7 percent for the two seasons, respectively). Either the system works very well (preventing unexcused absences) or enforcement is a genuine problem.

In case of serious failure by an individual to work, IAD serves a very useful function as an outside, impersonal "heavy." When a beneficiary's absences are serious enough to warrant canceling his rights, IAD is notified (sometimes informally). IAD then becomes responsible for initiating action, although the general assembly still must give an advisory vote. In one recent case on Bermúdez, a beneficiary's rights were canceled because of excessive drinking and absence from work. The colectivo, however, managed to soften the impact of the cancellation on the beneficiary's family by requesting that IAD pass the drunkard's rights to his wife. While IAD has no legal obligation to do so, they followed the recommendation. The wife is now the official beneficiary, and she hires a "substitute" to do her share of the work. Colectivo members seem to think that this was a good solution to the problem. Incidentally, they also considered it quite normal that IAD would do what they recommended in terms of membership determination. As mentioned earlier, the effective level of self-management on Bermúdez is quite high.

This role of IAD as an outside, neutral enforcer is obviously quite important. The same circuitous channels of informally notifying IAD to initiate action are used in cases of member dishonesty which warrants cancellation. However, in the case of minor infractions, such as missing an occasional day of work, IAD is of little help. Largely motivated by problems of controlling this sort of "small-scale free-riding," Bermúdez divided itself into two equal-sized farms of 44 members at the end of the 1982 crop year. Members claim that it is much easier to organize a collective work group of 44 individuals (or, more accurately, 28 field levelers) than a group of 88 (56) individuals. Both halves of Bermúdez report that the Spring 1983 crop season went more smoothly because of the division into smaller farms.

This change of group size can be looked at as having two effects. First, it diminishes scale diseconomies in getting a work group together. People spend less time waiting for everyone to show up before starting work. Second, it cuts in half the returns to "free-riding." In a group of 88, an individual who feigns illness bears only 1/88 of the cost (since the cost of the diminished output is shared equally), while privately appropriating all the benefits. With group size cut in half, the individual bears 1/44 of the cost. While this is an improvement, there is still a healthy incentive to free-ride under the new structure. In fact, as is discussed in part 4, the Bermúdez colectivos are currently further extending this small-group logic to take further advantage of managerial scale diseconomies and incentive effects.

Getting individuals out into the field is only part of the internal work management problem. Once they are there, effective production requires that they work with some intensity, care, and intelligence. We will refer to these nontime components of the labor input as "effort." By refusing to supply effort, an individual can free-ride on the group in the same way he might by refusing to show up for work. Effort inputs and the quality of work also need to be coordinated and controlled if production is to be effective.

The discussion in section I referred to strands of obligation which might be conceived as internally compelling the individual to work hard to maintain the group. Such internalized attitudes probably carry some weight on Bermúdez, given that the high level of self-management and participation seems to have created a cohesive group. But, Finca Bermúdez certainly does not exclusively rely on such devices to coordinate effort and control free-riding. Actual field work (e.g., weeding or leveling fields) is carried out in work teams of five or six people. Observation of some teams suggests that there is a certain amount of group spirit in the teams. When asked how the team reacts to a member who is doing a sloppy job, Bermúdez beneficiaries said that they call it to his attention. To the extent that such peer group presence is effectively applied, this common interest (and "interestedness" which is promoted by participation of the beneficiaries) in the collective output solves a major managerial problem. Many manual tasks in agriculture are extremely hard or costly to supervise, either directly (by observing labor inputs) or indirectly (by measuring individual outputs). The spatial dispersion of agricultural activity and the interaction of human with stochastic biological processes contribute to the costs of agricultural supervision. To use Brewster's (1950) term, it is the lack of a repetitive "machine process" in agriculture which makes it difficult to use techniques of industrial labor supervision in management. However, to the extent that every man is supervisor of the fellow working next to him, information and enforcement costs are cut dramatically. While it is hard to measure the effectiveness of this peer supervision, it is informative to note that there were no general complaints about low work effort.

A second device employed by Finca Bermúdez to assure work effort and quality is Production Committee review of work completed. We had difficulty determining the exact operation of this review process, suggesting that it probably is an informal process. In any event, members of the Production Committee do keep an eye on how the fields look. When asked what is done when sloppy work is found, farm members replied that the offending parties are simply told to "do it over again." It seemed obvious to them that this is what is to be done in such situations. As Bermúdez's "natural leader" heads the Production Committee, the obviousness of that response may be a reflection of the leader's stature and authority.

In summary, to the degree that Bermúdez is operating effectively, as it seems to be doing, internal management of labor must be relatively effective. Colectivo members do complain about faked absences from work, but, on the other hand, they do not seem willing to give up their "health insurance" for improved incentives. The data on unexcused absences show very little application of the available monetary sanction, implying either a very effective or an ineffective system. Given that there is a certain amount of (nonpeak season) surplus labor built into the system (see table 2), a few absences outside peak season probably do not matter. We failed to find any information on the seasonal distribution of absences and of sanctions. If sanctions are more readily applied to important work-days missed, then there would be a device to charge the free-rider something like the marginal costs of his behavior. However, no specific mention of such an adjustment was found.

Once labor is in the field, supervision seems to revolve around the two poles of participatory interestedness of members and effective leadership.

These are the same factors identified as contributing to effective management of resource allocation. The model behind Finca Bermúdez's relative success now seems clear. After a brief discussion of family economic strategy below, we will consider remaining weaknesses in that model and current efforts in Bermúdez to modify it further.

3) Family Economic Strategy in Finca Bermúdez

This section examines the colectivo system on Finca Bermúdez from the point of view of the beneficiary. It tries to show the opportunities available to the beneficiary, and how those opportunities fit into family life-cycle economic strategies. Examining the colectivo model from this point of view should identify perceived deficiencies in the model and thus help clarify reasons behind pressures for reform of the model. The colectivo model is first reviewed in terms of its place in long-term family economic strategy. Short-term economic opportunities for the family within the colectivo are then discussed. While we were able to obtain a credible overall picture of family economic strategy within Finca Bermúdez, it should be noted by way of introduction that specific details were hard to obtain because of the sensitivity, and sometimes the quasi-illegality, of private income-earning activities by beneficiaries.

In terms of life-cycle economic strategy, a key component of beneficiary rights is their inheritability. As noted earlier, IAD is legally bound to offer a beneficiary's rights to family members upon the beneficiary's death. The family security offered by this provision is not complete, however, as the beneficiary's (and the family's) rights can be revoked by IAD for violation of land use and labor supply norms. This conditionality of beneficiary rights is a source of frequent complaint among campesinos, but, in the case of Bermúdez, this insecurity of tenure is tempered by the practice of requesting that IAD assign a canceled beneficiary's rights to a family member.

Despite the conditionality, and hence legal insecurity, of property rights in the colectivo, other features of the colectivo system increase the economic security of those rights relative to those enjoyed by an individual farmer with 50 tareas under fee-simple ownership. Risk-sharing features of the colectivo effectively increase the security of family rights. As noted in section III.A above, collective income-sharing and debt assumption shield the individual from microcrop failures (resulting from either external events or individual negligence). Without this collective feature, the family would be much more likely to lose even fee-simple rights for debt repayment. Seen from this point of view, the colectivo offers the family quite a valuable asset--albeit one over which beneficiaries would clearly prefer to exercise unconditional ownership if the insurance features could be maintained.

In addition to providing an inheritance upon the beneficiary's death, the "substitute system" within the colectivos provides a way to pass employment and income rights to family members prior to the beneficiary's death. When a beneficiary becomes unable to complete his share of collective work effectively (either in his own judgment or in that of the general assembly), his work obligations are assigned to a substitute. In Bermúdez, the substitute is typically a grown son. Income is divided between the beneficiary and the substitute. The norm on Bermúdez is that subsistence payments are split 55 percent to the

beneficiary and 45 percent to the substitute, while residual income is divided 65 percent to 35 percent. If the substitute is a son living at home, the actual division presumably matters little from the point of view of family welfare. Sons as substitutes also do not present any special beneficiary-substitute management problems.

The colectivo system thus provides the extended family with insured long-term access to employment and income. Over the life-cycle of an individual beneficiary it provides income and employment during working years and a post-retirement property income. A key limitation on family use of land reform assets is the prohibition against capitalization and sale of their property rights. In this sense the Dominican colectivo is a distinctly noncapitalist form of property creating a "feudalistic" immobility which ties the family to a particular piece of land. Of course, this attenuation of the property rights in the colectivo is not without its logic. What might happen should it be eliminated, and rights be made marketable, is discussed below.

In addition to this long-run relationship of colectivo property rights to family economy, the immediate opportunities and limits to family economic activity presented by the colectivo can be examined. Besides the obvious provision of job and insured income rights to beneficiaries, the colectivo can be discussed in terms of immediate family labor utilization and the ability to separate property income from beneficiary labor-supply requirements.

A frequently voiced complaint of colectivo members on Finca Bermúdez and elsewhere is the inability to utilize family labor on the colectivo effectively. The major barrier to family labor use is not a legal prohibition against the practice. Rather, colectivo members complain that under current income-sharing rules there is no way appropriately to account for and remunerate unequal family contributions to net farm profits. Since colectivo exploitation of one's own family is deemed inappropriate (and perhaps unprofitable if family members have high enough opportunity costs of their time), the practice on Bermúdez and elsewhere has been to forego use of unremunerated family labor.

Another view of the family labor problem was provided by the IAD supervisor in Mao-Esperanza. He produced a ream of forms which had been prepared to allow residual income division to reflect differential family labor inputs. According to this informant, the colectivos showed no interest in this modification of accounting practices which would have resolved their major objection to family labor use. His interpretation was that reform beneficiaries were "holding out" for a more thorough transformation of the colectivo which would grant them more individualistic property rights (i.e., the "asociativo" model). Maintaining the complaint that the colectivo prevented use of family labor was seen as being politically useful for the beneficiary. To substantiate his perspective, the IAD supervisor pointed to a much greater willingness on the part of beneficiaries to experiment with new forms of internal discipline on asociativo farms than on colectivos. Whatever the merit of this particular interpretation, it is worth remembering that the beneficiaries are involved (quite actively and self-consciously in some places) in a political strategy to transform property rights. The existence of such a political strategy obviously complicates the researcher's task. Beneficiaries have an interest in overstating problems with the colectivo which are politically salable (e.g.,

ineffective resource use), and understating politically ineffective complaints (e.g., inability to capitalize property rights). In the final section of this paper we will be returning to this issue of identifying the real failings and motivations for change of the colectivo model.

Despite the apparent accounting problems, family labor does find some paid employment on Finca Bermúdez. We were told that many of the hired transplanters are family members. In fact, as one Bermúdez member put it, "We have to hire outsiders during peak periods because there are not enough family members." No precise data were obtained on the actual quantity and value of family wage labor.

It is probably worth emphasizing that use of unpaid family labor can be economically quite distinct from use of paid labor (family or otherwise). As noted by Marglin (1976) and others, the wage system itself is an institutional barrier to the use of low productivity labor. The colectivo cannot pay a relatively high wage for low productivity family labor without transferring income from other beneficiaries to that particular family. Yet, if those marginal inputs are used (without a wage payment), more is produced allowing some incremental increase in income for everyone. On a family farm, where there is no need to pay a wage to family members, those incremental labor inputs are likely to be used (if they have insignificant opportunity costs), and total production and income are likely to be higher, other things equal. But on the colectivos, where a wage system is in effect, there is this potentially significant institutional barrier to use of low productivity family labor. For this reason, the family labor problem is significant for both the family and for the national economy. Less certain is whether that problem is rooted in a true institutional rigidity of the colectivo system, or whether it is part of political gamesmanship.

A final element of apparently great significance for immediate family economic opportunities in Bermúdez is the ability of healthy working-age beneficiaries to obtain substitutes. As discussed earlier, the substitute system is designed as a form of health and old-age insurance. While Bermúdez members were reluctant to talk in specifics, apparently 29 out of the 44 beneficiaries on the Bermúdez-A division have substitutes. In a brief conversation with the listero, about a third of the 28 could be accounted for as beneficiaries who were disabled, old, or widowed (who had inherited their husband's rights). IAD sources said that the farm had about 16 "official" substitutes. This information would suggest that there are between 12 and 21 beneficiaries who physically could work, but choose not to. In apparently all these cases, sons are used as substitutes, and thus the family unit suffers no income loss from use of a substitute. The collective apparently does not suffer either from extensive substituting. In another context, Bermúdez members noted that the farm maintains tight control over substitute quality, requiring replacement of any slack substitute workers with more suitable substitutes. There were in fact no complaints about the quality of substitutes, and one individual specifically said it was not a problem.

With perhaps nearly half of the able-bodied beneficiaries not working in the fields, the obvious question is what do they do. Persistent small group questioning on this issue finally produced an old, retired member who chided

the others for refusing to say anything on the subject. Unfortunately, as he was stating that some beneficiaries hold outside positions, the conversation was interrupted by the appearance of a larger group. While no further information was obtained, it seems logical to assume that when a beneficiary has better, alternative employment opportunities than his son, a substitution is made.

One could argue that this flexible use of the substitute enhances social efficiency. But a major social cost could occur if the substitutes were inferior workers, or if substitution created divisions within the colectivo which proved destructive of unity and efficient management. This latter possibility is a real danger of government policy which tries to squeeze a cooperative agricultural sector with unfavorable price movements. Diminishing the real returns to collective work is likely not only to diminish labor supply in the usual sense, but also to destroy confidence in collective effort and to disrupt the relatively fragile devices of collective management.

Because of this substitution pattern on Bermúdez, colectivo rights are much more flexible than they first appear. If the beneficiary's opportunity costs are high enough (and he lacks a low-opportunity-cost son), then presumably it is also common practice to hire an outside substitute. In this way, the colectivo income attributable to returns to land can be separated from labor supply and income. This separable remuneration of factors of production diminishes substantially the "feudalistic" characteristic of colectivo property rights. Prohibitions on capitalization still remain, however. No information was obtained on whether those prohibitions can be circumvented.

One possible explanation for the current high rate of substitution on Bermúdez is a decline in the rate of return to collective activity. The macro-economic statistics in table 4 show that colectivo members have been facing deteriorating terms of trade. The real per-member collective-income figures in table 5 show a downward trend, with real income having peaked in 1975. Assuming that this trend represents declining potential earnable income (as well as declining earned income), it represents an increasing incentive to search for off-farm work.⁵ To the extent that off-farm opportunities are available, or that beneficiaries have achieved a level of private accumulation to make them available, the substitution pattern may be explicable as a price response phenomenon. Unfortunately, no information was obtained on the evolution of substitution since the colectivo's founding.

5. The collective income figures in table 5 may not give an accurate account of member earnings from collective work. Conceivably, members could use working capital funds (in excess of those earmarked for subsistence payments) to pay themselves. If this were done, the table 5 figures would under-report member income. As mentioned earlier in the text, some members do apparently work as wage labor on the colectivo from time to time. However, that did not seem to be a common practice. The table 5 figures on percentage of collective credit actually disbursed suggest that members are not drawing heavily on credit as a source of unreported income. If they were, it would be expected that more than 50%-80% of Bermúdez's line of credit would be utilized.

This review of family economy clearly shows that property rights in Finca Bermúdez are a valuable, relatively secure, but flexible asset. In the final part of this section on collective practice on Finca Bermúdez, we review two recent modifications of the colectivo model.

4) Recent Organizational Changes on Finca Bermúdez: Sharpening Work Incentives and Managerial Information and Authority

Beginning with the spring 1983 season, Bermúdez began functioning as two smaller farms, Bermúdez-A and Bermúdez-B, of 44 people and approximately 106 hectares each. As discussed earlier, colectivo members appear satisfied that this division has helped reduce certain scale diseconomies in management and internal organization. At this writing (mid-1983), the logic behind the formation of two Bermúdez farms is being further extended to the formation of grupitos (little groups) within each farm. This evolution can be examined as a further effort to adjust organizationally to the location of scale economies and diseconomies within the rice production process.

Both Bermúdez farms have divided their workforce into grupitos. The bases for the grupitos are the separate rice fields as defined by irrigation infrastructure. A particular grupito is assigned to each separate field. As the fields are irregularly sized, the grupitos vary in size to maintain an approximately equal man-land ratio in each field. Bermúdez-A has 11 fields, with grupitos ranging in size from 1 to 7 beneficiaries. Bermúdez-B is divided into 10 fields with from 2 to 7 members assigned to each. The basic idea of the grupito system is to make each grupito responsible for organizing and carrying out certain activities in its field. Implementation of the system is being carried out in stages. In the first stage, the grupitos are used simply to improve information and informal managerial control, without any change in payment rules and incentives. In the second stage, the grupitos are imagined as separate accounting units, sharpening financial incentives for individual labor inputs.

Assignment of individuals to specific grupitos was carried out by the general assemblies of both farms. When asked how it was done, the reply was simply that everyone chose to work with others "according to their likes." Specific questions about the difficulty of coordinating collectively the likes and dislikes of 44 people got no stories of any problems. Apparently assignments must have been fairly well worked out informally ahead of time or significant centralized leadership used to make the divisions.

Bermúdez-B actually began producing with the grupito structure for the Winter 1983 rice crop. (Bermúdez-A will begin using their grupitos during Spring 1984.) Resource allocation, external relations and contracting (including credit management), plowing and harvesting are still organized at farm level. Manual tasks performed by the beneficiaries, such as leveling fields, weeding, and irrigation, are carried out autonomously by each grupito in its field.

None of these tasks delegated to the grupitos requires internal management and coordination on a scale larger than the grupito itself. Rather than letting the organization of all parts of the production process be dictated by the

large scale needed for easy management of mechanized and resource allocation tasks, grupitos allow for organizational specialization. With grupitos, the work group is shrunk to the minimum size consistent with the one scale-sensitive aspect of the manual production activities: water control.⁶

This organizational change has several effects. First, it partially disrupts the centralized division of labor traditionally used on Finca Bermúdez. Each grupito decides on specific task assignments. Second, it simplifies the daily process by which the "chichiguas" (see p. 23) descend on the fields.

Bermúdez-B members seemed convinced that grupitos had made it much easier to get collective work teams together and out into the fields. Informal group management is understandably much easier with smaller groups. Three people waiting on a fourth can easily all go together to check up on the missing individual. Forty people waiting on four more find it difficult to go informally and get the laggards out of bed and into the fields. The grupito system thus dispenses with the centralized information collection and formalized management controls needed in the large group situation. As the grupitos organize those stages of production for which there is no scale economy larger than the group size, it seems like an intelligent conservation of managerial effort and organization. Smaller groups may also contribute to improved group spirit and loyalty, creating those cooperative multi-stranded relationships which enhance work effort and performance.

The shift to grupitos has apparently had an impact on the land use plans of both Bermúdez farms. As noted earlier, both Bermúdez-A and Bermúdez-B plan to plant only tanioka in 1984, with no retoño crops. Technical reasons were those most commonly given for this shift in cropping patterns. But there is also an institutional reason. With grupitos, those individuals lucky enough to be in a field designated for a spring planting and a winter retoño would be required to do much less work than individuals in fields allocated to two consecutive tanioka plantings. By shifting all fields to two plantings, the problem of that potential inequity is avoided. When asked about this sort of problem, one member of Bermúdez-A said that indeed it was a reason that Bermúdez-B had chosen to shift to all fields to tanioka for the 1984 seasons.

One further stage in the evolution of grupitos is envisioned on Finca Bermúdez. It is hoped to establish separate accounting of grupito input expenditures and output production, and then to pay residual income shares based on grupito performance. Bermúdez-B plans to begin such a method in Spring 1984, while Bermúdez-A has yet to determine if and when they will begin with this revised payment scheme.

6. It is fundamental to remember at this stage that in manual agricultural processes there are no real economies of scale in the internal management of labor effort and quality. Unlike an industrial process which may be able to increase effort and production by bringing the "putter-outers" inside under one roof and one supervisor, spatially dispersed, biologically dependent, agricultural tasks show no such managerial scale sensitivity.

In terms of the "free-rider" logic discussed earlier, income determination based on the production of smaller groups diminishes incentives to slack off. In a grupito of four beneficiaries, an individual bears one-fourth of the total cost of feigned-excuse absences or of slack effort. Currently, that individual bears only 1/44 of the cost. Before this year, he bore only 1/88 of the cost. Payment along grupito lines thus sharpens "piece-rate-like" incentives for individual effort supply. Together with the avoidance of unnecessarily large-scale manual work management, this aspect of the grupito system apparently portends improved internal work organization and production.

All is not quite as straightforwardly beneficial as it might seem, however. Linking income determination to the production of an ever-smaller group and an ever-smaller piece of land destroys the implicit insurance against microcrop failures enjoyed by colectivo members. In an effort to surmount the moral hazard problem of that insurance by sharpening individual incentives, grupitos diminish risk-sharing and insurance. There are two major impacts of this change.

First, increasing piece-rate incentives, and thereby increasing the fluctuations of income, creates a countervailing incentive for less labor inputs by risk-averse individuals. The returns to labor effort may still have the same (or higher) expected value as before, but if that expected income is seen as highly variable and risky, the individual may prefer to invest his time and effort elsewhere. To the extent that microcrop variance is high and individuals are risk averse, "solving" the free-riding problem may have little positive effect on production effort.

A second impact of the shift to grupito-based income determination stems from problems created by grupito economic losses. Who bears the debt if a grupito fails to cover costs for reasons of either crop or effort failure? If the colectivo assumes the debt as a group, with repayment borne by everyone's future profit shares, all sorts of incentives are created for grupitos to show book losses, to avoid official marketing channels, and to create general financial chaos. If the grupito alone bears the loss, then the question arises about what happens if the debt is (or becomes) large. Is the grupito's land seized, or the income from it? If so, security of tenure is diminished, creating possible problems of class stratification within the colectivo. Any of these problems, which create divisions within the colectivo, could negatively affect the functioning of those stages of production still executed at farm level.

Solving the problem presented by this interplay between insurance and incentives is one of the great challenges facing the Dominican reform colectivos. In some ways grupitos may be a better solution than complete individualization of the manual aspects of production. For one thing, grupitos do maintain some risk-sharing and insurance aspects. For another, grupitos are still a collective form of production, maintaining the legitimacy of collective activity per se. Establishing complete individualization as a first principle promises greater stratification and may tend to delegitimize collective processes and control. Even the individualized beneficiary on the asociativo model is very dependent on collective organization, coordination, and control of some activities. Three hectares of rice simply do not comprise a large enough unit to

permit completely independent planning, contracting, and production at the current level of technology employed. Some attention needs to be given to potential problems of stratification and group cohesiveness as the Dominican reform model evolves.

Eastern Europe and China provide examples of intermediate forms of collectivized/individualized production. Perhaps the basic principle which requires attention (besides stressing the legitimacy of collective activity and control),⁷ is dividing income by a mixed system. Both Hungary and China have systems in which part of the individual's income is determined by overall group productivity and part by his individual (or small-group) performance. For example, a small work team is awarded so many work-day points for executing all manual tasks in a particular field. The value of those points is determined according to total farm production, more or less like the traditional Dominican colectivo model. In addition, the individual receives some portion of the value of his individual (or small-group) production. This latter share can be determined either as a percentage or as the total amount above some minimum production level.⁸ In the East European and Chinese systems, percentages and levels can be adjusted so that expected income is the same as under a modified grupito or asociativo system. But the distribution of risk would be different, and there would be a greater sense of maintaining the collective structure as there is still a direct income link to collective performance.

These comments on the evolution of the grupito system are meant only to flag potential problems in the Dominican reform sector as it undergoes decentralized transformation. Section IV now turns to summarize and examine the dynamics of the colectivo system in more detail.

IV. FINCA BERMUDEZ: LESSONS FOR AGRARIAN REFORM FARM ORGANIZATION

On Finca Bermúdez the dynamic of decollectivization has been set in motion. The shift to small group (grupito) production described in the preceding section has already dramatically altered internal work organization and incentives. However, the grupito system stops short of the individualized production of the asociativo described above in the introduction. Whether or not Bermúdez continues its evolution toward the asociativo model depends not only on the incentive-insurance and scale trade-offs discussed earlier, but also on

7. Advocates of the asociativo model in particular tend to couch their arguments in terms of getting away from the "communistic" colectivo system. While perhaps politically useful to speak in such terms, the tendency to portray collective activity per se as a terrific infringement on individual liberty and rights is possibly dangerous.

8. The difference between a fixed percentage and a minimum level may be significant for marginal labor incentives. For an example of this, see the economic debate on share cropping versus fixed rent tenure.

broader political and economic factors.⁹ Abstracting from these latter factors, and hence from the issue of how Finca Bermúdez actually will evolve, this section focuses on the narrowed set of microeconomic factors which determine the desirability of decollectivization. It is hoped that the case of Finca Bermúdez provides lessons useful for general questions about agrarian reform farm organization.

Three general issues are involved in making decisions about the appropriateness of the asociativo versus the colectivo model. These are:

- 1) the importance of scale-sensitive tasks and the subsequent requirements for joint action;
- 2) the severity of labor discipline (moral hazard) problems which appear in joint action;
- 3) asentamientos, as other economic enterprises, require good management, which includes the ability to make good decisions and the authority to implement them. In cooperative production, this is difficult to achieve. The previous history of an asentamiento, its past attainment of good management, and efforts made by IAD to foster and reinforce good management are a third factor which determines the appropriate organizational model.

Such functions as good management of improved technology are likely to be scale-sensitive, difficult for individual campesinos, and easier for representatives of a group or for officials of IAD. But attitudes and abilities change over time. In our interviews we heard from members of Finca Bermúdez that initially they needed the supervision of the IAD manager (though in this particular case he also exploited them for his individual benefit). Over time, however, their leaders have taken over from IAD most of the production decision-making and the supervision of work, and in the last year of the study they are shifting many of these management functions to small grupitos. The institutional forms of IAD asentamientos need the flexibility to accommodate such changes in the managerial competence of the asentamientos and of their individual members.

Labor discipline in a cooperative enterprise requires continuous effort to maintain good performance. It depends on many things, as described in preceding sections, but in part the need for it changes over time. Since income is a function of the effort of members as well as good management, initially income depends on inexperienced members being managed by experienced managers and being subject to the discipline imposed by these managers; however, as members become better able to assume many management functions by themselves, the effort to impose discipline may become greater and can be increasingly avoided

9. For example, the degree to which reform beneficiaries perceive that the asociativo model will increase the marketability and value of their property rights and the degree to which the political system permits individuals to capture increases in their property value will also influence the degree of decollectivization.

by doing away with supervision and with members doing the work individually rather than collectively.

Another reason for this shift is that if the members experience problems of poor labor discipline in collective work, then even dedicated workers may become demoralized and less inclined to contribute faithfully to collective activity. At that point the appropriate choices are either measures to increase the authority of asentamiento leadership or a shift towards more individual responsibility for work.

In this connection it is important to recognize differences between members in their attitudes toward collective work. In public meetings and in our interviews the leaders and probably a majority of the members spoke out strongly in favor of a more individual organization of work in the form of grupitos or maybe a transition to the full asociativo model. However, more quietly, some members used the interviews to express questions and worries about the asociativo model, particularly about the responsibility for credit repayment.

Good managerial decisions and managerial authority are crucial for good labor discipline, high productivity and income. But such conditions are not achieved automatically even when the income of individual members depends on good management of activities that are difficult to perform individually. In asentamientos that have good management, effort is needed to maintain it. In asentamientos that do not have it, factionalism and strife may be so divisive that finding alternatives to the need for asentamiento-wide management for many activities may be necessary, or other drastic action may be required. Again differences between individual members need to be recognized. It would be useful to have alternatives for the less cooperative members which might permit a more cooperative attitude and better management among the remainder.

The way to accommodate these changes over time and between members would be to allow asentamientos to shift from colectivo to asociativo or in the reverse direction. But it would be useful if individuals could also shift from one model to another. For example, a two-thirds vote, or a simple majority in two or three years in a row, could be required to change an asentamiento from one model to another. But an individual who did not want to remain with his asentamiento when it voted to change the model could be given an option to join another farm operating under the model that he preferred. Or, conversely, a member who wanted to change the model when his group refused to do so could also exercise the option of joining another group. In some cases the asentamiento might be large enough so that subdivision could be permitted with each part using a different model. Also, the option of joining another group could be open for other reasons than change of model.

It would probably not be easy for members to join other groups, since this involves not only joining the desired institutional model, but also changing housing, friends, schools for children, and other community ties. All these factors would be considered before members made their decisions. But the option to have that choice might be an important feature of flexibility and a safety valve which helps members decide whether they want after all to make the best of their current membership or to transfer to another asentamiento with all the adjustments which that requires.

If such flexibility were allowed, it would be important for IAD to retain the right that the total number of members be maintained. Otherwise there would be an incentive to let the number of members decrease in order to increase average incomes.

But once such flexibility is contemplated, the colectivo and asociativo models need not be the only alternatives. A fuller range of alternatives might include the following:

- 1) IAD or a specialized management company might temporarily take over an asentamiento supervising the members and paying them wages (this has been used in the Venezuelan land reform);
- 2) colectivo model with various modifications:
 - a) colectivo hires an outside manager on terms decided by the colectivo;
 - b) standard model colectivo;
 - c) colectivo with work supervision by grupitos;
 - d) colectivo with work supervised by grupitos, and income and credit repayment by grupitos;
- 3) asociativo model with various arrangements for which work is to be done collectively and individually; following the style of the Chinese responsibility system, income payments could also be a mix of average farm-wide earnings and individual production;
- 4) individual farming with land owned by the campesino might be permitted; however, such owners would be required to repay IAD the value of the land.

The temporary takeover by outside management might be a useful device for an asentamiento with low incomes and divisive factionalism. Wage payments would provide members with higher incomes, while it would be up to management to show that better management, better labor discipline, and better relations with each other are capable of producing better results. While the system is maintained members would be subject to the imposed discipline. They, however, would have the option to vote to end outside management in favor of the colectivo or asociativo model, or they could individually move to other asentamientos or leave the reform system.

The opportunity to purchase land and farm individually might also be a useful safety valve. Clearly some members are in favor of owning land, while some IAD officials are very suspicious that even the change to the asociativo is an attempt to do away completely with cooperative features of the reform and to capitalize on the gains available from owning and maybe selling the land. The reform sector might benefit if the most ambitious and most efficient were allowed to leave cooperative models and farm on their own provided they were required to pay IAD the value of the land. The requirement for payment should be such that IAD could buy land for the reform sector equivalent to the amount lost by the sales. Landownership would include the right to resell, though

this should be limited until the full price was paid up, or if the full price was not paid up sales might only be permitted to other land reform beneficiaries.

In conclusion, the most important thing is not to have fixed answers to these issues but to be sensitive to changes and flexible in accommodating differences. Each one of the three general issues is apt to change over time; also differences between asentamientos and individual members need to be taken into account.

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