

LTC Paper

**INFORMAL TENURE CONDITIONS IN
IRRIGATED SETTLEMENTS OF SRI LANKA:
A REVIEW OF EMPIRICAL RESEARCH EVIDENCE**

by

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TENURE
CENTER**

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on Social Structure, Rural Institutions,
Resource Use and Development

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All views, interpretations, recommendations, and conclusions expressed in this publication are those of the author and not necessarily those of the supporting or cooperating organizations.

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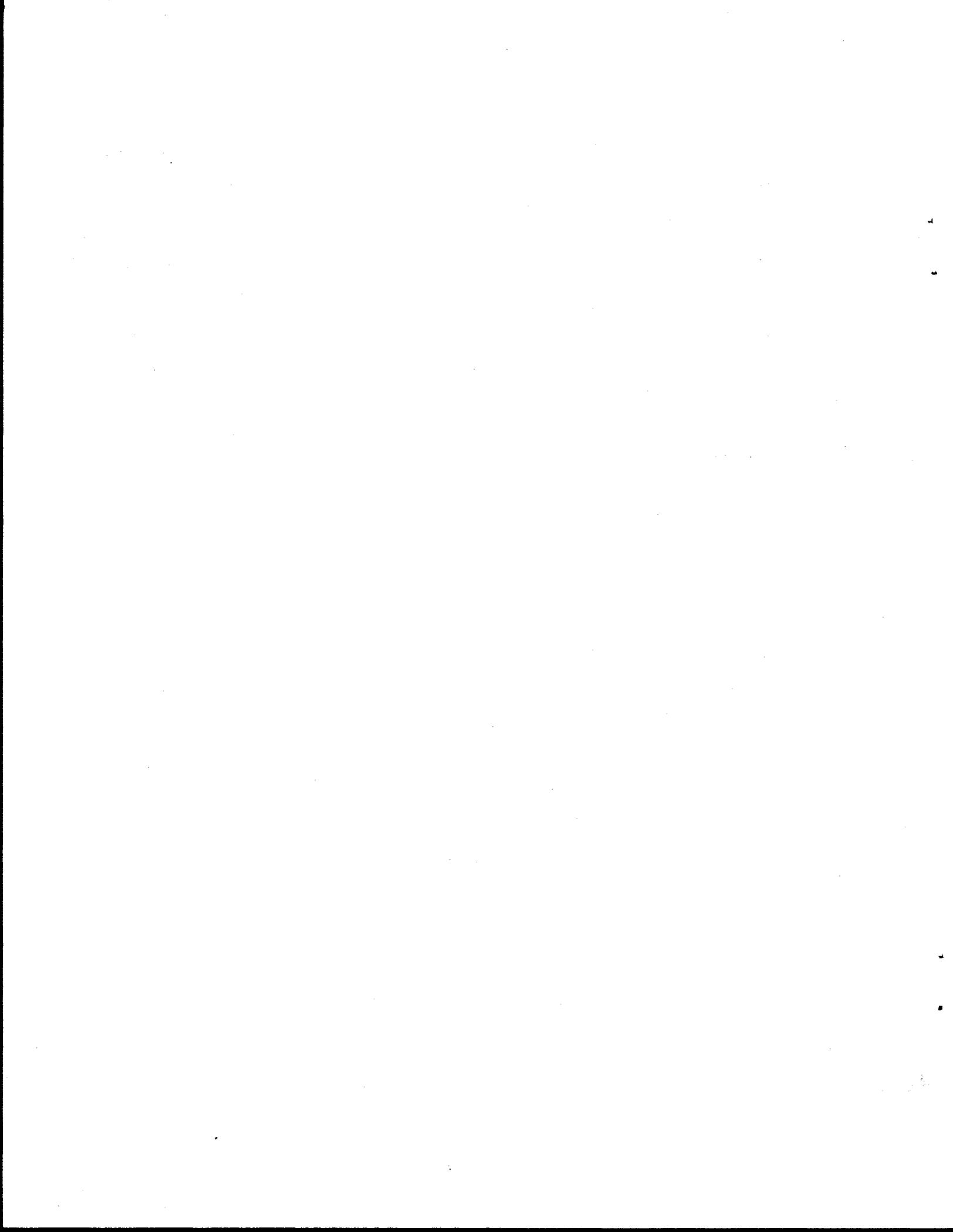
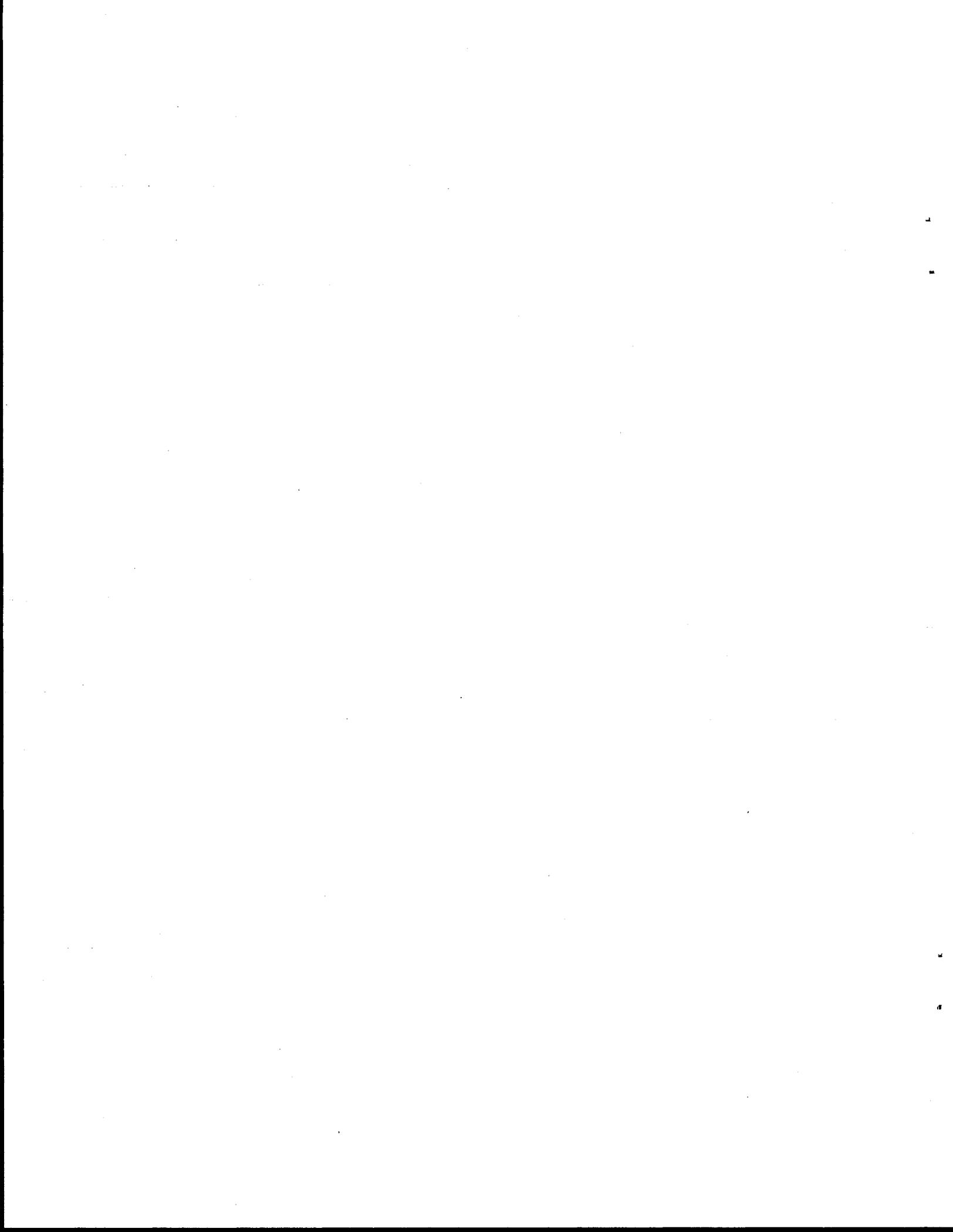


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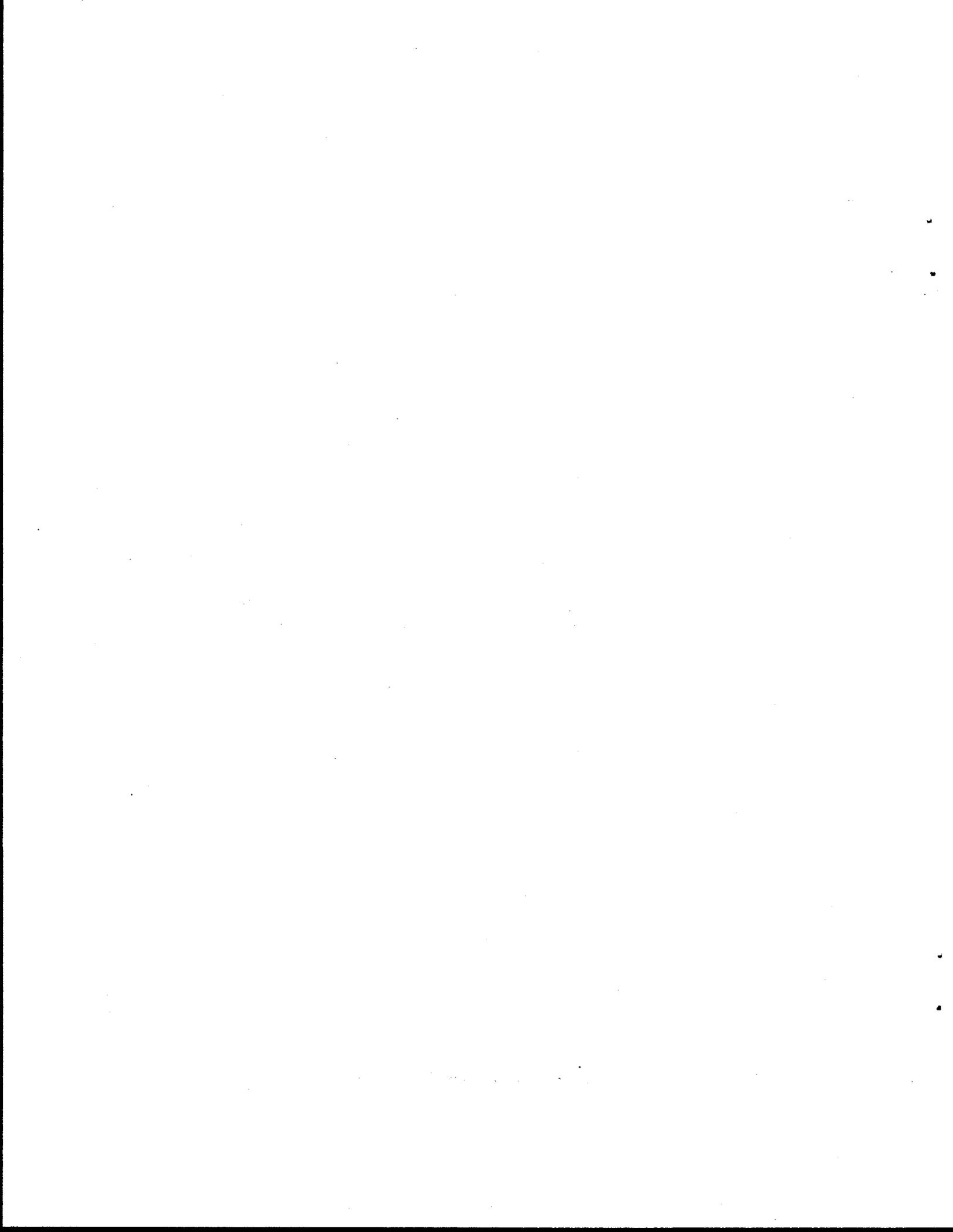


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LIST OF ACRONYMS

AMP	Accelerated Mahaweli Programme
ARTI	Agrarian Research and Training Institute
ARTEP	Asian Regional Team for Employment Promotion
AVP	average value product
HYV	high-yielding varieties
IMI	International Irrigation Management Institute
IMPSA	Irrigation Management Policy Support Activity
MPI	Ministry of Plan Implementation
NARESA	Natural Resources, Energy and Science Authority of Sri Lanka
OFC	other field crops
PMU	Planning and Monitoring Unit, Mahaweli Authority of Sri Lanka

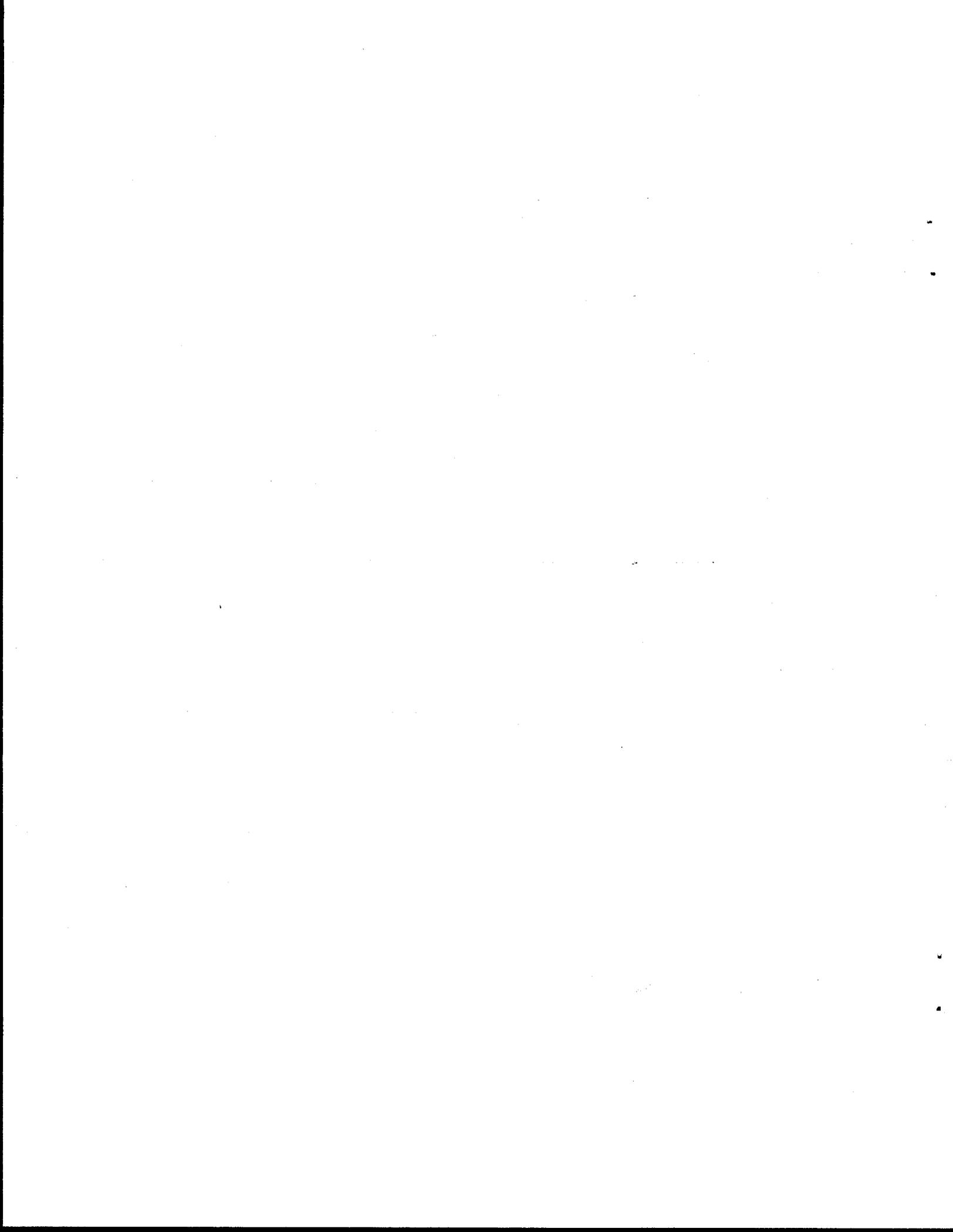


SUMMARY

This study, through a survey of existing literature, examines whether a legal strengthening of individual rights in irrigated settlement lands would lead to higher investment, better land management, greater output, and higher incomes. The empirical evidence presented does not show a clear relationship between a higher concentration of land rights and the anticipated benefits.

However, the presence of informal land-transaction processes reveals that spontaneous flexibilities have emerged within the agricultural land base of irrigated settlements. Such land-market adaptations yield positive dividends with respect to the creation of larger operational holdings with higher investment, greater use of technology, more commercialization of production, and increased displacement of inefficient cultivators. The study therefore argues that strengthening the bundle of rights held by users of settlement lands may result in further development of large operational holdings.

Granting of full ownership rights to users of cultivated lands must coincide with the promotion of other sectors of the economy so that the social costs of instituting freeholder tenure can be alleviated, at least over the medium term. This study recommends that simultaneous development of the support service of agriculture would assist in better realizing the benefits from the creation of freeholder tenure in settlement lands. The need for a national program of tenure research is also highlighted. Such a program could find conclusive responses to the many tenure-based questions and issues that emerge when creating a freehold tenure base in settlement projects.



INFORMAL TENURE CONDITIONS IN IRRIGATED SETTLEMENTS OF SRI LANKA: A REVIEW OF EMPIRICAL RESEARCH EVIDENCE

1. INTRODUCTION

Irrigated agriculture has been the principal beneficiary of public-sector investments in agriculture in Sri Lanka since independence. It accounted for about 40 percent of public-sector investment and about 90 percent of agricultural investment in the first half of the 1950s. By 1982, during the peak of investment activity in the Accelerated Mahaweli Programme (AMP), the share of irrigated agriculture in public-sector investment reached 42 percent while its proportion of investment in agriculture was approximately 84 percent. Since then, the subsector of irrigated agriculture has shifted into a "management phase," largely due to the rapid construction of major dams and channels in the Mahaweli, with its development works, including settlement, well on the way to completion. Thus, a recent Public Investment Plan (1991-1995) determines irrigated agriculture to be 9 percent of public-sector investment and 52 percent of investment in agriculture. Much of this investment is expected to be in the rehabilitation and management of existing irrigation works rather than in the creation of new ones.

Around 300,000 hectares (including the Mahaweli) have been provided with irrigation facilities under the major settlement projects and, from early 1930 to the end of May 1992, over 211,285 landless families colonized them. With the second and third generations already matured in the older settlement projects, the above numbers probably have increased by over 100,000 additional families. A total settler population of around 1.8 million probably occupies the major irrigated projects. All inhabitants are dependent in one way or another on the economy of the settled projects.

The expectation that irrigated-land settlement projects would induce a substantial contribution to domestic food supply—the reason, in fact, for the large investment extended for their creation—has been largely realized. Lands placed under irrigated settlement are among the prime agricultural expanses of the country. Between 1970 and 1977, paddy production in these projects grew at the rate of 4.1 percent per year. Between 1977 and 1982, this rate increased to 8.8 percent per year. The projects also accounted for about 65 percent of the annual national growth in paddy production between 1974 and 1982. Since 1977, these projects have added approximately 8,900 hectares each year to the total area of irrigated land in the country (MPI 1985, p. 69; 1984, p. 32). At present, about 45 percent of domestic

paddy production comes from irrigated-land settlements. Nearly 21 percent, in fact, came from a single project, the Mahaweli, in the 1990/91 agricultural year.

Irrigated settlement projects also make a substantial contribution to the national coffers in terms of foreign exchange savings in food and fuel imports. Savings have been considerable over the last several decades through the production of food crops and the generation of water power. Between 1983 and 1991, for example, foreign-exchange savings via Mahaweli rice production alone are estimated to be as high as 17.8 billion rupees. For the same period, the import-substitution value of chili production was close to 4.1 billion rupees. To the end of 1991, in addition, the cumulative value of hydroelectric power generated by the Mahaweli was about 18.6 billion rupees, with significant foreign exchange savings in oil and coal imports (PMU 1992). Despite intervening price inflation, the production of food and power also helps to keep wage and power costs competitive in all sectors of the economy. Hydroelectric power has a notable relative impact on the growth of industry, commerce, and services and on the quality of life.

Yet the projects themselves have not prospered. They are largely monocrop enterprises and there is little diversification. Attendant trade and commerce activities suffer from the seasonal effects of monocropping. Thus, avenues for investment, employment, and income generation in these projects appear to be static and constricted. Even the gigawatts of power produced by new projects such as Mahaweli are seldom used for the projects' own development.

A major portion of the surplus value of agriculture is siphoned out of the settlement projects by way of merchant capital investments and servicing institutions such as banks and cooperatives and is reinvested elsewhere. One estimate (Wanigaratne 1989, p. 37) places the lost value to be as high as 65 percent of the total crop production. At the same time, the unmarketed share of production, which dampens commerce and distorts the behavior of the market mechanism in the Mahaweli System H settlement, has been estimated at about 22 percent (Meemeduma 1992, p. 58).

With sluggish settler investment, little headway toward intensification and even less toward diversification, low and declining overall net returns from farming, and little or no accumulated savings among the majority of settlers, living conditions among occupants have remained relatively low and static over the years. Empirical studies reveal absolute and relative poverty conditions not only in the older projects but even in the new ventures such as the Mahaweli (see annex, p. 33). The studies show poverty-generating forces at work irrespective of the age of the project or of the intensity of state intervention in management.¹

1. With the exception of Mahaweli System H, where household surveys have shown a high incidence of absolute poverty (about 29% in 1984/85), poverty in new projects seems to be about 6% of total households. The incidence in older projects seems to be higher at around 35-40%. Similarly, income disparities seem to be larger in older projects (see annex). In new projects, the lowest 30% of the households generally received 13-15% of total income as opposed to 11% in older projects. In new projects, the highest 10% of the households received around 20-22% of total income, whereas in older projects, around 25-30%. [cont.]

Thus, far from being "a prosperous multitude" composed of the principal producers of food for the nation, settler farmers seem to be incapable of improving their lot through their main economic activity, food production (PMU 1991, pp. 34-36).

Many programs have been instituted by state agencies over the past several decades to counter deepening constraints in settlement projects, including: optimal crop combinations, mixed farming, contract farming, large commercial operations run by corporate interests and farmer groupings, agroindustries and nonagricultural enterprises run as micro-, small-, or medium-scale concerns, better administration of needed services and facilities, new biochemical and low-cost mechanical technologies, and training for farmers in new technologies. However, none of these strategies has yielded tangible economic transformations which could generate prosperity in these projects. Meanwhile, numerous research studies, administrative reports, and authoritative observations reveal that poverty-producing forces continue to enlarge when combined with generational pressure on the settlements' economies.

Therefore, a key issue confronting settlement policymakers at present is: What new strategies should be developed to remove or lessen the major constraints which currently obstruct diversification of the economic base of these settlements so that the projects can generate and sustain prosperity among the majority of their residents?

1.1 STUDY OBJECTIVE

The ultimate success of any new system developed in these settlement projects is invariably linked to the state of the resource base. That is, is the resource base positioned to promote such a strategy? This paper analyzes the land base, particularly its tenure, because land tenure figures prominently in most policy decisions and deliberations on irrigated settlement projects since the early 1920s.

From the inauguration of the land commission, it has been presumed by settlement planners that since land is the principal asset provided by the state to settlers—and is often their only asset besides labor—strengthening the security of tenure and a higher definition of individual rights in land will foster greater investment in land, better land management, and higher outputs. This, in turn, will promote higher returns and better living standards among those who receive settlement lands.

More recently legislation such as the "Swarnabhoomi" Land Grants Law prescribes further user rights over alienated state land, including the right to use land as collateral in institutional credit undertakings as well as a limited right to sell land to others who have the

In early years of settlement, income disparities are lessened by general uniformity of the economic status of persons selected for colonization, similar exposure to the rigors of resettlement and survival, and equal access to land, water, and services. As settlements grow older, economic disparities between those who have "succeeded" and others who have "failed" probably become more marked as the former settlers, through their entrepreneurial skills, gain greater access to credit, produce, land, labor, and administrative and political power brokers. One consequence is increasing bifurcation of the settler society into rich and poor groups.

capacity to use it in the best interests of themselves as well as of the state. New amendments to the land ordinance, which allow private individual and corporate commercial interests to gain access to irrigated agricultural land, are in the offing (Sri Lanka 1990, SECTION 10.21, p. 219; Wickramarachchi 1991). Such legislation is based on the notion that "freehold" tenure, or some closely associated concept, would promote better land use and result in greater productivity, efficiency, incomes, labor absorption, and technology use than temporary or perpetual leasehold tenure. It is also believed that freehold tenure, denoting a higher definition and conveyance of individual rights to settlers, would encourage greater investment in the land. At the same time, a relaxation of controls over the formation of a land market is expected to lead to better use of the prime agricultural lands of the country in compliance with long-term national interests.

There are very few studies on informal land transactions, informally derived tenure relations, and their interaction with land-management practices, input use, credit, productivity, and settler ability to invest in crop and enterprise diversification. Objective information on such relationships is not readily available. The available research findings, the Report of the Land Commission of 1987 notes, "have to be evaluated with some care" (Sri Lanka 1990, SEC. 10.21, p. 215).

While recognizing these data limitations, this paper attempts to explore the validity of the reasoning behind the above legislation within the context of land tenure as it has evolved in settlement projects. A second objective of the study is to identify data gaps in land tenure issues needing further research on settlement-based development.

2. ACCESS TO LAND IN IRRIGATED SETTLEMENT PROJECTS

2.1 LAND DEVELOPMENT ORDINANCE AND 99-YEAR LEASE

Since the early 1930s, an important economic rationale underlying the creation of irrigated settlement projects in the Dry Zone frontier regions of Sri Lanka has been the establishment of new institutional arrangements which would permit settlers to gain more secure access to future incomes while, at the same time, leading to higher agricultural productivity. At the core of the new institutional arrangement was a 99-year lease, which was to assure security of access in perpetuity to a holding of prime agricultural land.

The first land commission (1927-1929) provided the philosophical foundation for these objectives, made operative in Land Development Ordinance no. 18 of 1935. Specifically, the commission recommended that a form of protected tenure be instituted in case of state-land alienation, first, to prevent improvident land conveyances which could deprive settlers of continued access to their lands and, second, to preserve the integrity of the land asset as public property to be used in the future to further national interests.

The 1935 Land Development Ordinance restricted disposition of allotted land through lease, mortgage, or any other form of conveyance. A mortgage of land to a cooperative

society in which the alienee was a member was allowed, but seizure and foreclosure of alienated state land by court decree for nonredemption of debts was not. A unitary system of succession, which sought to prevent fragmentation of lands through the inheritance, was also decreed.

It was expected that the capacity of the recipient to better himself or herself would be enhanced through the legal and administrative assurance of security of tenure in land. The provision of land would lead to better access to other services, including credit, which in turn would improve the alienee's capacity to increase access to a range of opportunities for economic improvement.

The security of access to land, and via land to services, in perpetuity, meant the opportunities for economic betterment via initial access to the land resource would also be preserved in perpetuity. Consequently, the provision of land to the rural poor through the creation of irrigated-settlement projects provided an initial access route as well as continued security of such access to current and future income streams.

Not only did the ordinance ensure the alienee's right of land access, but it also ensured that this right as well as the physical integrity of the landholding in which it is exercised would remain secure for the use of future generations and national land-use priorities. The ordinance anticipated that with the passage of time new state land-use priorities would emerge. The ordinance thus allowed for a coupling of traditional objectives of redistribution of state land among the landless with a need to ensure its use in the best interests of it and the national economy and polity at large.

2.2 CONFLICT BETWEEN LEGAL AND INFORMAL TENURE

Access to land is more than a matter of legal confirmation of ownership/user rights to a plot of land. It is a complex issue historically, socioculturally, normatively, and attitudinally, involving the basic right of access to the land of a country or region as claimed by its citizenry—a birthright, so to speak. Therefore, legal rearrangement of the bundle of rights held to an extent of land by a body of users invariably becomes entangled with processes that are more central to the evolution of the larger society. Considered in this context, the legally imposed tenure systems in settlement projects seem to be artificial arrangements that can be sustained over time only through continual modification to suit the multidimensional changes that take place in the settler society.

As a settlement project matures, customary tenure relations systematically infiltrate the legally prescribed systems. This is due not only to settler responses to economic pressures arising from the production process but also to economic, social, and normative constraints coming from the enlarged family population that seeks accommodation through the landholding. Consequently, an amalgam of both customary and legally prescribed tenure systems emerges in settlement projects that is both dynamic and complex. In addition, this leads to negative effects such as separation of de jure users from de facto users through

informal land conveyances, land fragmentation, anomalies in the distribution of incomes from land, and so forth.

In irrigated settlements, the law that governs the lands (the 1935 Land Development Ordinance) prescribes a unitary use access and succession over alienated lands. The principle of equal division of property accepted by both common law and customary practices as a basic right of parcenary claimants in traditional village lands is not accepted by the Land Development Ordinance. Thus, the areas of conflict between the settlement law and customary practices pertaining to land transactions and other conveyance forms are more broad and marked in settlement lands.

In contrast, the areas of conflict are much fewer in traditional village lands where pre-existing customary practices that determine land access have been overlaid by common-law stipulations. Where these legal stipulations coincide with customary practices (as with the principle of equal division of property), the pre-existing customary land-allocation system that determines the distribution of the bundle of rights over land has remained relatively intact and in harmony with the common law.

It is thus a natural development that customary tenure relations in irrigated-settlement lands have gone underground to subvert legal rigidities imposed by the Land Development Ordinance. Informal and insecure though it may seem, these tenure relations in fact foster wider land access and greater land-market flexibilities in settlement lands.

If current tenure arrangements do not provide adequate impetus for settlers to improve their lives, then the question arises as to whether the same legal tenure arrangements actually serve as the major impediment in settler attempts to gain access to higher cash incomes. The report of the third land commission (Sri Lanka 1990, p. 213) and other recent opinion (Wickramarachchi 1991, p. 14) appear to support this thesis.

The nature of economic activities conducted on landholdings, returns received, and the level of household consumption costs and cash savings may well be more important considerations for the settler, as an investor, in determining economic improvement than tenure security. Yet from the viewpoint of utilization of a public resource, the relationship of settler economic activities with the legal tenure of settlements warrants a deeper investigation, particularly when viewed against the long-standing policy expectations of a prosperous settler multitude, a higher contribution to the domestic food supply through settler endeavors, and conservation of the land resources for future uses of the nation.

The issue of tenure security in settlement-based agricultural lands must also be viewed in terms of its importance with respect to both the current settler-farmer occupiers as well as current and future nonsettler investors. For the current settler-farmer users, the Land Development Ordinance and its subsequent amendments provide adequate legal safeguards against improvident alienation and land fragmentation to preserve both the integrity of the lands and the tenure rights of their legal users in perpetuity. For these settlers a basic

precondition of their tenure security is a highly restricted land market, which the land laws seek to create.

On the other hand, for both settler and nonsettler investors seeking land for productive investments, a basic precondition for security of their investments is higher land-market flexibility, which permits expanding accumulation and use of land, intensifying production and reallocating land among alternative economic uses. The necessary demand conditions for an active land market are present in the case of irrigated settlement lands. Yet legal tenure arrangements arising from a multitude of small, microholdings provided under various forms of permits (temporary and long-term leases and restricted grants) also tend to stifle optimization of the land resource among alternative economic uses.

To some extent, informal land transactions provide a way (however legally insecure) to attract investment that could foster such utilization. Yet the bulk of prevailing land transactions, particularly as settlements grow older, tend to be conducted on a subsistence ethic. Settler accommodation of family members, relatives, and others merely to assure maintenance of their subsistence probably optimizes "subsistence satisfaction" rather than cash profits or investment. Thus in the informal land market, too, a prevailing subsistence ethic dominates transactions and stifles the realization of an informally driven higher economic use of the land.

Considerations such as water-release schedules and technical services also force a uniformity in the cropping pattern in any given season, which may not be in the interest of "best use" of the land resource. Thus, even if land-market flexibilities may be fostered by giving further tenure rights to current users, the best use of land may not be realized where technical and management rigidities are imposed under "guided" irrigated settlement.

3. SELECTED TENURE ISSUES IN IRRIGATED-SETTLEMENT LANDS

Is there conclusive evidence that state provision of tenure security and holding-size integrity has assisted in ensuring the continuous improvement of living conditions, productivity, and access to future income among the large mass of settlers? Only a positive answer to this question could refute the contention of the third land commission that tenure impositions placed on settlers should be minimized "if a farming community is to be successful and sustainable" (Sri Lanka 1990, SEC. 10.33, p. 219). Available empirical evidence on the tenure base of irrigated-settlement lands is therefore examined below to respond to the question and to meet the challenge posed by the land commission.

3.1 TENURE EFFECTS ON PRODUCTIVITY

Empirical evidence suggests that tenure-form effects on land productivity are neutral. Studies conducted in both lowland and hill-country regions of the Wet Zone and in both small-village tank lands and productive irrigated settlements of the Dry Zone reveal that yields in leased, tenanted, and informally subdivided paddy lands are not significantly different from those

associated with lands cultivated by their owners. Wanigaratne (1986, p. 13) noted that in the Gal Oya project, the paddy yields reported for lands under spontaneous occupation, a tenure form of great uncertainty, closely paralleled those received from regular lowland holdings by the occupiers. Spontaneously occupied holdings received an average yield of 2.8 metric tons per hectare in Maha 1982/83 as opposed to 3.0 metric tons per hectare for regular allotments. In addition, Wanigaratne (1984, p. 240) found that yields obtained from informally subdivided paddy lands corresponded to those secured by unsubdivided lands in the Uggal Kaltota project, where subdivided holdings got an average yield of 3.7 metric tons per hectare as against 3.6 metric tons per hectare in unsubdivided holdings during Maha 1982/83. Available empirical evidence on paddy lands under single and joint ownership also does not reveal a clear relationship between tenure form and yields (see table 1).

In the absence of empirical justification of such a relationship, the often-quoted argument—that productivity is raised by legally defined land-tenure forms that strengthen individual ownership rights in land—appears untenable. Increased agricultural productivity seems to be more clearly identified with factors outside of changes in land tenure—water availability, edaphic conditions, and the use of fertilizers, high-quality seeds, or agrochemicals.

3.2 TENURE AND OPERATIONAL FRAGMENTATION OF LAND

3.2.1 DIFFERENTIATION OF OPERATIONAL HOLDING SIZES

Informal land-allocation processes both foster a proliferation of microholdings and facilitate consolidation of land in large holdings through land accumulation by a minority of settlers and other investors. The collection of holdings of more or less equal size characteristically available at the inception of a project becomes differentiated into a wide range of operational sizes as settlements mature.

A study of Gal Oya (Widanapathirana 1986) revealed that lowland holdings averaging 1.63 hectares were provided to settlers in the 1952/53 agricultural year. Within 27 years after receiving land (that is, by Maha 1979/80), the average size of lowland holding had declined to 0.82 hectares. In some of the head-end units, where water availability was high and land fragmentation through informal processes was concentrated, the decline in the operational holding size was as much as 45 percent (or 0.75 hectare on average). Therefore, the original occurrence of equal-sized holdings was found to have been replaced by a size distribution ranging from 0.20 hectare to 20.41 hectares. The differentiation of operational holding sizes was caused by a dual process of land fragmentation through informal allocation among family members, leases, mortgages, sales, and land accumulation by settler and nonsettler investors. The Agrarian Research and Training Institute (ARTI 1979, 1980) investigated five major irrigated projects, which had been in existence for 15–20 years at the time of study (Maha 1976/77). The study revealed that fewer than 30 percent of the settlers cultivated lowland holdings of sizes equal to or greater than what had originally been allocated (1.22 hectares). The remaining 70 percent or more operated holdings of sizes ranging from less than 0.41 hectare to about 1.22 hectares (see table 2).

TABLE 1 Paddy yields in lowland holdings by tenure form and informal land subdivision status^a

LOWLAND HOLDINGS	KANDY DISTRICT ^b (maha 71/72)	ANURADHAPURA DISTRICT ^c (maha 71/72)	RAIN-FED LANDS (yields mt/ha)		IRRIGATED SETTLEMENT LANDS (yields mt/ha)	
			Colombo District ^d (maha 71/72)	Beminiwatte APC area ^e (maha 73/74)	Uggal kaltota ^f (maha 82/83)	Gal oya ^g (maha 82/83)
1. Holdings under:						
a. Single owner cultivator	2.39	2.16	1.90	1.44	3.69	
b. Joint owner cultivator	n.r.	n.r.	n.r.	1.43	3.91	
c. Full tenant	2.57	1.81	n.r.	n.r.	n.r.	
d. Part tenant	2.85	1.95	1.90	1.83	n.r.	
e. Share tenant	n.r.	n.r.	n.r.	n.r.	3.22	
f. Cash lease tenant	n.r.	n.r.	n.r.	n.r.	3.86	
g. Spontaneous occupier/user	n.r.	2.17	n.r.	n.r.	n.r.	2.78
h. Regular settler occupier	n.a.	n.a.	n.a.	n.a.	3.72	2.98
2. Holdings affected by informal subdivisions of land/product	n.a.	n.a.	n.a.	n.a.	3.74	n.a.
3. Holdings not affected by informal subdivisions	n.a.	n.a.	n.a.	n.a.	3.65	n.a.

Abbreviations: n.r. = not reported; n.a. = not applicable

- a. Land-tenure data drawn from the different studies defy cross comparisons in view of different definitions that have been adopted. Some take on the distribution of the bundle of rights held in land to draw out aspects such as "single" and "joint" ownership. Others take on a share of the operated area to determine the difference between "owner-tenant" (over 50% owned) and "tenant-owner" (over 50% tenant operated). Tenant categories are further differentiated in studies by (part-time, full-time) involvement or by share of household income and by mode of rent payment (cash or produce). Some studies differentiate between legally introduced tenures and those informally derived to separate the landholdings on the mode of access to land.
- b. ARTI (1974b), table 6.1, p. 92.
- c. ARTI (1975a), table 6.11, p. 65.
- d. ARTI (1975b), section 5.11, p. 49.
- e. ARTI (1975c), table 6.1, p. 92.
- f. Wanigaratne (1984), table 6.6, p. 240.
- g. Widanapathirana (1984), p. 17.

TABLE 2 Percentage of households reporting cultivated lowland and extent of land per farm in selected irrigated settlement projects

Project	Reference period	Age of project (years)	Household sample size (n)	Average area of alienated lowland (ha)	Average area cultivated (ha)	Percent households reporting:					All holding sizes (%)	
						<0.41 ha	0.41-0.82 ha	0.82-1.22 ha	1.22-1.63 ha	≥1.63 ha		
Mahawilachchiya ¹	Maha 76/77	21	150	1.22	1.14	-	20.0	70.0	6.0	4.0	100	
Mahakandarawa ²	Maha 76/77	15	275	1.22	0.82	3.0	42.9	25.0	14.0	16.0	100	
Pavatkulan ³	Maha 77/78	20	160	1.22	1.14	4.0	2.0	89.0	5.0	-	100	
Padaviya ⁴	Maha 77/78	20	221	1.22	1.18	3.0	19.0	63.0	8.0	7.0	100	
Vavunikulam ⁵	Maha 77/78	9	312	1.22	1.02	6.0	28.0	64.0	2.0	-	100	
Dehiattawela ⁶	Maha 84/85	27	66	1.22	-	30.0	42.0	19.0	5.0	4.0	100	
Etimole ⁶	Maha 84/85	27	34	1.22	-	6.0	12.0	20.0	62.8	-	100	
Kotiyagala ⁶	Maha 84/85	28	20	1.22	-	-	5.0	-	95.0	-	100	
Kumbukkan Oya ⁶	Maha 84/85	28	43	1.22	-	7.0	25.0	20.9	13.9	32.6	100	
Mahaweli H system								<u>0.82-1.02 ha</u>	<u>1.02-1.22 ha</u>			
Midellewa ⁷	Maha 78/79	2	42	1.00	-	4.8	45.2	31.0	11.9	7.1	-	100
Thoranagama ⁸	Maha 78/79	2	40	1.00	-	12.5	22.5	12.4	37.5	7.5	7.5	100
Thoranagama ⁸	Maha 79/80	3	41	1.00	-	12.2	24.4	19.5	24.4	4.9	14.6	100
Aluthgama ⁹	Maha 81/82	5	65	1.00	-	3.6	3.6	1.8	52.7	18.2	20.0	100
H2, H3, H4 ¹⁰	Maha 83/84	7	120	1.00	-	2.0	8.0			14.0	19.0 ^b	100
Thoranagama ⁸	Maha 83/84	7	112	1.00	-	13.4	13.3	57.0 ^a	50.0	9.8	9.0	100
Thoranagama ⁸	Maha 85/86	9	118	1.00	-	27.1	8.5	4.5	33.9	8.5	15.2	100
								6.8				

- Source: 1. ARTI (1979a), table 3.5, p. 19.
 2. Ibid. (1979b), table 3.5, p. 21.
 3. Ibid. (1980a), table 3.8, p. 31.
 4. Ibid. (1980b), table 3.3, p. 21.
 5. Ibid. (1980c), table 3.6, p. 23.
 6. Talisman and Leonoff (1980), appendix 3.0.
 7. Siriwardena (1981), appendix F.
 8. Tilakasiri (1986), table 4, p. 17.
 9. Krimmel (1986), table 2, p. 16.
 10. Silva (1985), table 10.

- Notes: a. Up to 1 ha = 55%; 1-2.11 ha = 22%.
 b. Among holdings over 1.63 ha, 96% were ≥2 ha.

From an initial position of near equity, where all settler households in projects cited in table 2 received 1-1.2 hectares in lowland allotments, a process of holding size differentiation has apparently taken place. Around 80 percent of households of both old and new projects tended to cultivate holdings less than 1.22 hectares; 30 percent less than 0.8 hectare; and about 10 percent less than 0.41 hectare. At the other end of the scale, about 13 percent of the households cultivated lowland holdings equal to or more than 1.63 hectares, indicating that some operational consolidation of land in large holdings also took place.

In a study of the Uggal Kaltota project, Wanigaratne (1984, p. 139) recorded a decline in average holding size from an initial area of 1.22 hectares in 1964 to 0.41 hectare by Maha 1982/83, eighteen years later. The size distribution also broadened from 0.41 hectare to over 2 hectares within eighteen years. Similarly, in a study of Mahaweli System H, Silva (1985, table XV) showed that nearly 55 percent of households were cultivating lowland holdings of less than 1 hectare by Maha 1983/84, within nine years of the project's inception. Operational holding sizes ranged from greater than 2.5 hectare to less than 0.41 hectare. The breakup of the initial, more egalitarian holding-size distribution into one of more inequity is thus attributed largely to the presence of informal land transactions.

3.2.2 LIMITS TO OPERATIONAL FRAGMENTATION

Nevertheless, unlike what Geertz (1966) found in his study of agricultural involution in the *sawah* paddy lands of Java, there may not be continual fragmentation of land "into ever more minute pieces" in Sri Lankan irrigated paddy settlements. Wanigaratne (1984, p. 182), in his study of the Uggal Kaltota project, observed that settlers tended to limit user accommodation in their 1.2 hectare holdings. Nearly 65 percent of the 75 fragmented holdings examined in the study revealed a maximum user density of only 3-4 persons, including the settler. A land-share fragment of 0.3 hectare per user seemed to be the lowest size tolerated by settlers before suffering a drastic reduction in output shares received. The output per user tended to decline steeply (by as much as 55%) with more than 3 users per holding. The efficiency ratio² declined from 1.6 for single-user holdings to 1.3 for holdings which accommodated 3 users. The decline in the efficiency ratio provides indirect evidence of a decline in the marginal product per user with increasing accommodation of cultivators.

Studying tenure patterns and problems in major irrigated-settlement projects, Gunadasa (1981, p. 64) observed that despite fragmentation of land among successive generations, "subdivision does not fall below one to one and a half acres." This acreage also does not seem to lower land productivity. In this context, Leach (1968) observed:

There is no evidence at all that the inheritance system as such leads to excessive fragmentation. North Central Province villagers are sensible practical farmers; they are perfectly well aware of what is the minimum size of plot which, given the present cultivation techniques, it is practical to farm. They do not operate their inheritance rules in such a way as to make the whole system uneconomic (p. 143).

2. Efficiency ratio is computed as the value of output per value of aggregate input. This measures only the average performance per user on holdings of different user densities, or provides the average value product (AVP), but does not give a direct indication of marginal efficiency.

Limits to user influx on paddy lands therefore appear to be present not only within major irrigation projects installed by the state but also within village-based irrigation systems.

Tenure forms such as rotational tenure,³ evolving particularly in village-based paddy agriculture, also counter excessive fragmentation. Concerning rain-fed and minor-irrigation-fed village-based paddies, Obeysekera (1967, p. 206), Weerawardena and Kolonnage (1971, pp. 14-24), Ganewatte (1974), and Moore and Wickramasinghe (1978) demonstrated that land subdivision in the inheritance process did not inevitably lead to uneconomic fragmentation of land. Rotational tenure (that is, joint ownership with rotation of user rights) actually prevented the subdivision of land. Land productivity remained more or less the same for long periods of time, even though fragmentation of land shares increased with each succeeding generation.

Farmer (1960) and Obeysekera (1967), in documenting rain-fed and irrigation-fed village agriculture in Sri Lanka, and Geertz (1966), in studying the case of *sawah* paddy fields in Java, supported the view that fragmentation through subdivision of land rights may not necessarily result in a loss of production efficiency. Rather, in line with Colin Clark's (1967) thesis that population growth promotes higher agricultural productivity through technological change, a higher level of user accommodation through land fragmentation may in fact push "user-producers" toward productivity-enhancing technology. Application of such technology could sustain food needs in spite of reduced operational plot sizes.

Studies by Leach (1968), Gunadasa (1981), and Wanigaratne (1984) of irrigated paddy lands in villages and settlement projects reveal, nevertheless, that the practice of subdivision of land does not extend beyond a minimal operational size of holding. Obeysekera (1967) and

3. Rotational tenure appears in two basic forms: *tattumaruru*, which involves several co-owners who take turns at cultivating a given piece of land for either one or two seasons each; and *kattimaruru*, which entails several co-owners who take turns cultivating pieces of "more fertile" and "less fertile" land. According to the most recent national-level information available (dated 1973), *tattumaruru* accounted for around 65,901 operational units (or 3.4% of the total units in the island), occupying 40,726 hectares (or 2.6% of the total area) while *kattimaruru* accounted for 2,279 units and 6,388 hectares. Between 1946 and 1973, the percentage of holdings that reported rotational tenure increased from 6.8% to 11.4% while the area under such tenure increased from 6.5% to 10.1%.

It is noteworthy that, according to the 1946 census, the area under *tattumaruru* tenure included 23,907 hectares. This increased by 16,819 hectares (or by 70.3%) between 1946 and 1973 (to 40,726 ha). The increase in acreage under *tattumaruru* accompanied a general shift of concentration of holdings toward the micro-units. It is likely that the above acreage gain under *tattumaruru* represents an effort by microlevel landowners to stem the process of fragmenting and parceling land. The fact that the incidence of *kattimaruru* (which evolved from parcel scattering) remains insignificant perhaps reflects the disfavor with which co-owners of plots view this tenure form.

Opinion is divided as to the effect of rotational tenure on productivity. Certain studies (Ganewatte 1974; Weerawardena and Kolonnage 1971, p. 80) conclude that rotational tenure discourages investment in the land and thus reduces agricultural production. Others (West 1986, pp. 11-12) argue that the complexities of the system prevent accurate compilation of land records and cause incidence of land disputes to increase. Nevertheless, some studies (Moore and Wickramasinghe 1978; Obeysekera 1967, pp. 35-36) see positive features in rotational tenure. These studies indicate that a land-consolidating effect created through the pooling of land shares helps rational management of land and maintains productivity under conditions of increasing fragmentation and parceling of agricultural lands.

others observe that farmer society has in fact evolved tenure forms such as rotational tenure which counter fragmentation of paddy holdings below a perceived viable size which could meet subsistence needs of farmer families. Consequently, both a social control over processes of fragmentation and a user accommodation in land apparently exist in both irrigated and rain-fed paddy areas such that food security of those who have gained access to paddy land is not jeopardized by expanding household populations.

The economic rationale as to why settlers disallow user accommodation and land fragmentation below a perceived "minimum" operational holding level may lie in Cheung's theory of the nonexclusive resource. According to Cheung (1970), microeconomic theory as applied to resource exploitation prescribes that successive user influx to a nonexclusive resource (for example, a settler holding affected by informal land transactions) will eventually deplete the resource. Thus, a rational "owner" of the resource will not permit additional user entry beyond a certain "user density" point of equilibrium, at which marginal cost to all existing users through the loss of portions of individual incomes becomes equated with the marginal returns from an enhanced total output. After this point is passed, the "non-exclusiveness" of the resource becomes replaced by an "exclusiveness" such that further entry of users is prevented.

Cheung's argument is based upon a condition of constant technology and a tendency of existing users to intensify their production to counter income losses through successive entry of users up to the critical user density. However, where a change in technology occurs, as was postulated by Clark (1967), the resultant increase in task differentiation and intensification should shift up the "critical density" in user accommodation. Thus, more users could be accommodated in land without suffering a serious depletion of food and incomes to existing users through a resumption of the "non-exclusiveness" of the resource.

Consequently, the empirical finding that limits tend to be placed against excessive user accommodation in settlement-based paddy holdings perhaps reflects upon the possible existence of a technological plateau condition in paddy production. With the land base unable to maintain a "non-exclusiveness" due to static technological conditions, the critical densities in user accommodation may tend to remain relatively unchanged over long periods of time.

3.2.3 OPERATIONAL FRAGMENTATION: PRODUCTIVITY, INPUT USE, AND RETURNS

The incidence of informal accommodation of paddy-land users under various forms of tenure has been found to be higher in settlement areas where water availability, natural land fertility, and other considerations are more favorable. In a study of the Gal Oya left-bank settlements, Widanapathirana (1986, p. 57) observed that the head-end colony units, which are favored by a shared water supply, also attracted more new farmers, particularly those from second and third generations of settlers.

While such accommodation inevitably pushes down the average size of cultivated plots, available empirical evidence does not reveal a negative impact upon yields. In the Gal Oya left-bank settlements, the smallest decrease in cropping intensity (-7%) from Maha to Yala was within head-end areas, where land fragmentation was highest. In contrast, tail-end lowlands, with the highest decrease in cropping intensity (-70%), also revealed a minimal

fragmentation of land due to informal accommodation. The average yield in the head-end areas, at a low 1.93 metric tons per hectare in Maha 1979/80, was nevertheless 32 percent higher than the yield (1.46 metric tons per hectare) found in the less fragmented lands of the tail-end areas.

Data sheets from a study conducted in the H1 and H2 areas of System H of the Mahaweli project (see Silva 1985) indicated that microholdings received higher net returns per unit of land than larger holdings. For instance, microholdings of equal to or less than 0.4 hectare received an average net income equivalent to 7,706 rupees per hectare. This was 25 percent higher than what was received at the 1-hectare holding size level and 42 percent higher than the average net income received by operational holdings of less than 1 hectare. The inverse relationship between operational size of paddy farms and net returns to investment that was borne out by the Silva study of System H is, however, contradicted in other studies. Both Amerasinghe (1978, p. 81), in his study of the Minipe Stage 1 area, and Jogaratnam (1974, p. 122), in his review of the small-farm sector, provide evidence and argumentation that paddy farm holdings less than 1 hectare have considerable difficulty in achieving adequate income levels,⁴ whereas larger holdings of 1.2 to 2.4 hectares were able to achieve such incomes.

A study by Silva and Perera (1983, table VII, p. 19) in Block 307 of Mahaweli System H, observed that Maha's (1979/80) and Yala's (1980) yield variation did not correlate well with the size of cultivated holdings—with a correlation coefficient of 0.3 in Maha and 0.2 in Yala. Production data from a study by Joshua et al. (1980, table IIA, p. 72) of returns to investment in paddy farming in Kalankuttiya, Block 305, Mahaweli System H, in Maha 1979/80, revealed a positive relationship between yields and holding size. According to them, operational holdings greater than 0.75 hectare received an average yield of 3.6 metric tons per hectare, as against 4.4 metric tons per hectare in holding sizes 0.75 to less than 1 hectare and 4.8 metric tons per hectare in the terminal holding size class, 1 to 2 hectares. A study of the Uggal Kaltota project (Wanigaratne 1984, table 5.12, p. 182) revealed a similar positive relationship of paddy yields with holding size. Operational holdings less than 0.3 hectare indicated an average yield of 2.3 metric tons per hectare whereas holdings 0.3 to 0.5 hectare indicated a yield of 3.4 metric tons per hectare, and holdings 0.5 to 1 hectare, a yield of 3.7 metric tons per hectare. A recent study of farm household production and incomes in Mahaweli System C (see PMU 1991, appendix table 4a) found appreciable yield variations which accompany minor differences in the size of the operational holding; for example, operational holdings 0.82 to 0.84 hectare received an average yield of 2.35 metric tons per hectare in Maha 1970/91 as against 3.52 metric tons per hectare in holding sizes 0.84–0.87 hectare. Once more, a positive relationship was implied between holding size and yields. Data from a recent sample survey of production characteristics in Mahaweli System C, G, and H areas (PMU 1992) similarly did not reveal an inverse relationship between yields and the operational holding size. Instead, holdings less than 0.75 hectare received an average yield of 2.48 metric tons per hectare as against 3.04 metric tons per hectare in the 0.75 to less than

4. "Adequate income" was defined by Jogaratnam to equate to 5,000 rupees per month per household as against Amerasinghe's definition of 8,400 rupees per month per household.

1 hectare holdings and 3.25 metric tons per hectare in the greater than 1 hectare holding size class.

Abeysekera (1980, p. 14) in a production function analysis of a sample of 107 paddy farms from 5 districts in Sri Lanka deduced an almost constant return to scale in paddy farming—with a sum of coefficient values of 1.2. A nearly similar result was obtained by Wanigaratne (1984, p. 112) with a coefficient value of 0.9 in 88 settler paddy farms in the Uggal Kaltota project. It may be that economies of scale are not realizable in paddy farms the way the crop is grown in Sri Lanka—with family-labor-intensive, cash-saving methods of cultivation. Perhaps different results would have been obtained through use of the "operational holding size" rather than "owned holdings." Economies of scale may be realizable in larger paddy holdings, as evidenced from Herath (1983, 1986), Bogahawatta (1982, 1984), and others.

The inverse relationship between operated holding size and yields seems to be weak or absent in the essentially smallholder paddy production base of settlement projects. Numerous studies reveal that cash constraints have increased among paddy cultivators since 1980 due to rising input costs following removal of subsidies, price inflationary trends in purchased inputs such as fertilizer and agrochemicals, sluggish farm gate prices, and resultant declines in profit margins. Consequently, the capital for needed intensification in fragmented, micro-operational holding sizes is not usually within reach of the average tiller of such land parcels. This condition perhaps underlies the lack of empirical evidence on the existence of an inverse relationship between holding size and yields with respect to settlement-based smallholder paddy production.

On the other hand, yields tended to increase with increasing size of operational holdings within the same smallholder production context. This implies that users of larger holdings also have relatively higher access to capital and thus apply more yield-augmenting inputs than users of fragmented microholdings. Yet available empirical studies do not show the microeconomics of paddy holdings larger than 2 hectares, whereas informed opinion on land accumulation in settlement projects often points toward the existence of many such larger units.

Available empirical evidence from settlement studies thus implies a more positive (rather than an inverse) relationship between paddy yields and operated holding size. However, it is not possible with any degree of certainty to establish the presence of size economies over a range of operational holding sizes in paddy and their impacts upon yields. Available evidence seems to show that such a position exists, probably with the intervening presence of relative capital availability, and that average yields among operational land-size classes tend to increase with increasing operational holding size.

Fieldson (1981, p. 58), in his desk study of labor use in eleven major settlement projects and two Dry Zone districts with settlement-project concentration, observed that over a holding-size range between 1.10 and 1.96 hectares, there was no evidence that small units were farmed more labor-intensively than larger ones. Bogahawatta (1982, pp. 66–67), in an analysis of yield response to farm size and high-yielding biochemical package, concluded that both small and large farms applied about the same amount of fertilizer. The yield increases

in large holding sizes were attributed to larger areas under new varieties and to higher use of inorganic fertilizer and plant-protection practices. Herath (1983, p. 152), in a study of the relationship between holding size, production efficiency, and returns to scale, demonstrated that, in Parakrama Samudra, project holdings greater than 2 hectares received higher yields and higher input allocation efficiencies than those less than 2 hectares. A further study by Herath (1986, pp. 94-97) of the inverse relationship between productivity and farm size in the Mulankavil tube-well scheme concluded that increases of land size raises the elasticity of land at higher levels of inputs such as irrigation. He also noted that irrigation is one factor that enhances productivity of land and, within limits, can also act as a substitute for other inputs such as labor. The study therefore implied that land size by itself does not pose a constraint to increasing productivity. Bogahawatta (1984, pp. 110-116), in his study of the Giritale settlement project, revealed that while inefficiencies exist in resource use within holdings both greater and less than 0.90 hectare, the larger farmers tended to be profit maximizers. However, if farmers can be considered as rational producers, then the small farmers of Giritale appear to be maximizing something else—perhaps satisfaction of their basic food needs in their fragmented holdings.

Global research evidence, too, is inconclusive regarding the question of whether fragmented holdings are less productive or less conducive to the adoption of high-yielding technology. Nor has it been conclusively established whether fragmented holdings are more productive than nonfragmented holdings.

Ruttan (1977, p. 17), quoting from a number of contemporary studies from the Punjab region, Indonesia, the Philippines, and Kenya, concludes that neither farm size nor tenure is important as a source of differential growth in productivity or for the adoption of new high-yielding varieties (HYVs). Kanel (1967, p. 44) observes that changes in farm size do not seem to be a prerequisite in the adoption of yield-increasing technology. Farm size does not create cost barriers nor are increases in land/labor ratios required for such technological changes. Singh (1979, p. 17) substantiated the above conclusions in his observation that, with respect to India, the adoption of new HYVs was neutral to scale. Sharma (1973, pp. 243-49), however, had previously found that new HYVs are adopted far more rapidly by small farmers than by large ones in the Punjab. Dorner (1968), through a synthesis of seven studies of global relevance, added that "the evidence from various parts of the world supports the hypothesis that productivity per unit of land in small farms is as great or even greater than on large farms." Hayami and Ruttan (1971) and Johnston and Kilby (1975) found substantial resource allocation efficiencies in the smallholdings of Japan and Taiwan. Carter and Kanel (1992, p. 17) reason that small farmers have the opportunity to increase their production largely through the use of divisible technology such as HYVs and fertilizers. In a context of cash scarcity as found among smallholder paddy farmers of Sri Lanka, the usual access route to such technology is via state subsidies and delivery institutions.

3.3 INFORMAL LAND TRANSACTIONS AND INCIDENCE OF TENURE FORMS

A negative view of informal land transactions, often expressed in settlement literature, holds that the fragmentation of land due to informal transactions arises from and leads to linked factor markets. Settlers in need of cash to purchase technical inputs, food, and other

consumables either borrow from informal sources or take such goods on credit. In turn, they pledge a portion of either their holding or their output, which in turn depresses returns from land available for reinvestment and consumption. Unless they prune their own consumption and input use, the above process becomes cumulative and established, resulting in settlers' being deprived fully or partially of their landholdings.

Cases of holdings caught up in this process have been reported to be as high as 30 percent in Mahaweli System H. One study (Siriwardena 1981) reported that 40 to 60 percent of the lands have been leased out on cash and fixed crop-share arrangements in certain locations of System H. Alwis et al. (1983, p. 109) reported that among a study sample of 35 settler households drawn from Mahaweli System H, 57 percent and 51 percent in Maha 1981/82 and Yala 1982, respectively, had either leased in or leased out portions of their holdings under cash and produce share arrangements. Gunadasa (1989, p. 9) found that nearly half of the paddy allotments in the Kimbulwana Oya project were leased out to outsiders. This also meant that a large portion of the water supply that settlers received also moved to meet the demand of lessees. A study of Gal Oya left-bank settlement revealed that in certain localities, 20 to 30 percent of the lands are cultivated by nonowner operators (Widanapathirana 1986, p. 57). A recent study (Tennekoon 1991, p. 9) conducted in System C during the 1990/91 cultivation year revealed that 18 percent of land recipients were not operating their own lands as owner-cultivators. Rather, they served as caretakers, tenants, and agricultural labor for absentee owners. The incidence of such cases among irrigated-settlement projects in general parallels the System C case.

Currently, tenure forms of high complexity are found in settlement projects. Some share tenancies based on input- and produce-sharing arrangements favor settler owners. In these tenancies the agricultural inputs and cultivation functions which involve relatively high cash costs tend to be passed on to tenants by settler landowners. Certain leases, such as the fixed crop share lease (*vi poronduwa*) are advantageous to settler owners of lands that are marginal in terms of quality and access to irrigation water. A land rent of 50-60 bushels (1.04 to 1.25 mt) is usually agreed upon for a fixed crop-share lease over a 1 hectare holding, irrespective of the total output of the land (Tennekoon 1991; PMU 1992). The costs and risks of cultivation are passed on to the lessee and the fertility of the land is maintained by that same person, who thereby maximizes returns. Such leases tend to be favored by labor-deficient households, for example, female-headed young households or where household members are more involved in off-farm income-earning activities.

Recent findings from System H settlements of Mahaweli project (PMU 1992) reveal the emergence of a continuum of mortgage arrangements in settler lands. It appears to be bounded at one end by a system of "rolling mortgages," involving cash sums between 5,000 and 10,000 rupees per 0.4 hectare, where small portions of holdings are mortgaged by settlers over consecutive seasons in order to pay off previous mortgages and to derive small cash margins for their own use. These mortgages exploit cash advantages arising from changes in the seasonal demand for agricultural land. The end result is a conversion of land-owning settlers into landless tenants and laborers as increasingly larger portions of lands are mortgaged for larger loans to defray previous mortgages and to derive cash margins for

subsistence. At the other end of the continuum are mortgages involving large sums of cash (for example, 35,000–50,000 rupees per hectare), where the mortgager cultivates the entire holding or a large portion of it and enjoys its total product until the sum is settled. The settler usually doubles up as tenant and laborer.

Informally driven, outright sales of settler lands, though not occurring often, nevertheless do exist. In younger projects, such as System L, B, and C of the Mahaweli, outright sales of settler lands perhaps reflect the natural selection process whereby settlers unable to survive the multidimensional stresses of new settlement locations give way to more hardy types who ultimately form the permanent settler population.

Even in informal accommodation of own-family members in settler lands and in the output, some accommodation forms (for example, *bim hawula*—working the land together) are more favored by settlers holding land permits (that is, "owners") than other forms such as sharing the harvest on the basis of either inputs provided or equal or unequal division among family members (PMU 1992; Wanigaratne 1984, table 5.4, p. 139; Bulankulama 1986).

The presence of a range of tenure forms (such as nonowner cultivations and noncultivating ownerships, cash and produce-share tenancies, and other forms) distorts credit and input markets. As a consequence, disparities in cultivators' access to credit and inputs emerge. For example, both formal and informal credit has been found to be more readily available at lower transaction costs and less usurious interest rates and, at times, even under interest-free terms⁵ for "rich peasant" farmers than for others (Zander 1991; Tilakasiri 1986, p. 24; Lund 1986, p. 6; Elkaduwa 1983, p. 7; Gunasinghe 1981). Similarly, labor and other inputs are considered to be relatively more accessible to them under better "terms of trade."

On the other hand, the larger mass of settlers who do not receive access to needed production inputs on similar terms has little assurance of access to the income stream through an increase in productivity. Many reveal unexploited productivity margins in their agricultural holdings, sometimes as much as 50 percent or more from the potential yields that may be

5. Pre-market mechanisms of "reciprocity" and "redistribution" have been known to emerge (Gunasinghe 1976; Wolf 1969) where the need for cash to acquire production inputs and to defray consumption expenses arises within a context of a cash-scarce subsistence economy. Two such mechanisms identified by Wanigaratne (1984, pp. 282–92) are *aththamaru* and *seettu*. *Aththamaru* is defined as a generally interest-free cash and produce loan (for production and consumption), a transaction process which is found among close relatives, friends, and business associates. Even where a small interest rate is implied (for example, in a token interest by the loan taker on loan repayment), it is often interpersonal trust and desire to maintain cordialities that guide repayment of *aththamaru* loans. *Seettu* is a rotational savings system, where a pool of cash is built up through contributions made by a group of participants at predetermined times, which is conveyed to each participant at such times until the contributions made by all balance with the total value of the cash pool ends.

It is reckoned that if informal cash/produce exchanges were absent, a much higher share of the institutional credit given to settlers would have been directed to purposes other than those intended. On the other hand, the presence of such processes, which involve interest-free loans in a cash-scarce settlement economy, may distort the formal credit market and stifle commercialization of production because it retards accumulation.

derived under field conditions. A study by Silva and Perera (1983, p. 15) of income disparities in System H reports that 30 percent of the settlers in Block 307 had not been able to cultivate their entire holding. An important contributory factor, besides adverse edaphic conditions, was the settlers' inability to procure credit. A recent study of the settler economy of System C of the Mahaweli project (PMU 1991, appendix tables 4a and 4b) also shows that settlers were denied nearly 17 percent of the potential output of their holdings due to their inability to gain access to the technology needed to develop the land and to counter crop disease. This handicap, in turn, was due to their incapacity to raise the credit necessary to purchase the required technology and labor support.

Farmer (1960, p. 36) viewed the settlement planning process with its preoccupation on production of the staple (rice) and gearing of services and facilities to that end, coupled with a lack of a similar emphasis on other sectors of the rural economy which could absorb increasing settler populations, as being responsible for the above conditions. Others (for example, IMPSA 1992, p. 3) have written that this has arisen essentially because of settler inability, due to cash constraints and lack of a priori awareness, to acquire new technology that could increase the land's productivity. Abeysekera (1986, pp. 244-45) concluded that the nature of crop systems practiced, which themselves are a response to cash scarcity, water availability, and other technical constraints, can only sustain subsistence among settlers. It is inferred that this production base promotes rather than impedes informal land transactions and operational fragmentation of lands. Alwis et al. (1983, pp. 110-12) argued that nonavailability of land, land quality differences, and inequitable access to irrigation water among farmers are responsible for the settlers' inability to better themselves. These conditions promote informal land transactions as settlers seek to maintain or better their economic positions.

Yet, as mentioned before, substantial unexploited margins of productivity remain in all of the settlement projects, with current output in paddy, in other field crops, and in livestock development being much below their potential. Consequently, settler incomes, reinvestment capacities, and living standards also remain below their potential levels.

The fact that complex tenure forms have emerged in settlement projects through the operation of informal land transactions reveals the overall failure of the 1935 Land Development Ordinance and its subsequent amendments. The ordinance facilitated a process of institution building to both assist and safeguard the land-tenure base. An equal legal access to holdings of uniform sizes accompanied an equal access to irrigation facilities and state services, which facilitated a rapid and widespread diffusion of high-yielding seeds, new fertilizer mixes, new farm machinery, and yield-enhancing practices among the settler community. Through its land-tenure base, the ordinance in essence sought to establish a process of modernization in irrigated food agriculture.

The ordinance concurrently attempted to restrict the general process of commoditization that inevitably accompanies agricultural modernization. Thus, the land-tenure base was made legally secure against nonprescribed land transactions, fragmentation, and accumulation. The objectives were: (a) to ensure continued intergenerational access to land and thereby preserve

the peasant producers as a class, and (b) to preserve the integrity and productivity of the land for current and future national uses. Yet the empirical evidence on the complexity of evolved informal land transactions and tenures in settlement lands reveals that the inexorable operation of the market has forced a de facto commoditization of the land base.

The tenure insecurities inherent in informal land transactions, in a context where existing land laws forbid them, have distorted the behavior of the land market. Exploitative forms have emerged in the absence of regulatory measures which would have reduced such distortions. One outcome, as table 3 reveals, is the emergence of absolute and relative poverty conditions affecting a significant portion of the settler population, indicating a coexistence of mass poverty with a concentration of affluence in settlement projects.

3.4 TENURE TRANSITION

Land-tenure forms and relationships have been known to be sensitive to economic, sociocultural, and normative pressures which affect farmer household-level, resource-allocation behavior. Similarly, they are sensitive to national- or regional-level economic, political, and institutional changes (Obeysekera 1967; Leach 1968; Jacoby 1971; Migdal 1974; Rahman 1981). Viewed differently, the dominant tenure forms and relationships in a settlement project at any given time are manifestations of more fundamental pressures which affect both projects and settler households. Thus, legally prescribed tenure forms and relationships, within the context of irrigated-settlement projects, undergo dynamic changes as they respond to the multidimensional pressures that bear on the settler household economy as well as the project economy itself.

Settlement research indicates a high incidence of informal land transactions in settlement projects both in their inception phase as well as over the long run. This in effect means that the holding size and "ownership" integrity (through a 99-year lease) sought by the Land Development Ordinance as the basal land law governing alienation and subsequent use of state land by alienees are negated through a process of informally driven land/product fragmentation.

Consequently, a majority of settlers would remain risk-averse over the long run, with the expanding household populations largely dependent on the economy of allotted holdings for their food and living needs. They would tend to invest, season after season, in a "safe crop" such as paddy, which caters to both their food and their cash needs, rather than in a crop that demands high cash investment and is affected by market demand and price uncertainties. With increasing populations (in a largely paddy-based economy) and lowering disposable incomes, most farms tend to be operated on a constant, low stock of capital. Once more, the overriding objective of investment among settlers over the long run seems to be to secure a means of subsistence for an expanding family population at a minimal cash cost.

TABLE 3 Incidence of crop-share and cash-lease tenure in lowland holdings in settlement projects, Sri Lanka

REFERENCE PERIOD	SETTLEMENT PROJECT	AGE OF PROJECT AT REFERENCE DATE (years)	SAMPLE SIZE (households)	TENURE FORM IN LOWLAND (% of cultivators/holding)	
				Crop share	Cash lease
1967/68 year	Iranamadu ¹	17	247	-	17 ^a
Maha 1974/75	Minipe Stage 1 ²	36	92	40	9
Maha 1978/79	Padaviya ³	21	123	n.a.	4
Maha 1979/80	Mahaweli-H ⁴ : Midellewa	4	42	32	12
Maha 1979/80	Gal Oya: Units 10,7 ⁵	27	480	-	14 ^a
Maha 1979/80	Kirindi Oya: old settlement ⁶	19	-	73 ^b	2
Maha 1980/81	Kirindi Oya: old settlement ⁷	20	104	47	3
Maha 1980/81	Mahaweli H ⁸	5	55	7	4
Maha 1981/82	Mahaweli H ⁹	5	55	16	20
Maha 1981/82	Mahaweli H: Galnewa ¹⁰	5	-	5	23(17) ^c
Maha 1982/83	Uggal Kaltota ¹¹	20	98	5	2
Maha 1983/84	Mahaweli H: Thoranagama ¹²	7	112	8	6
Maha 1984/85	Mahaweli H: Thoranagama ¹³	8	112	13	5
Maha 1984/85	Dehiattawela ¹⁴	27	66	33	2
Maha 1985/86	Mahaweli H: Thoranagama ¹⁵	9	118	13	8
Maha 1985/86	Mahaweli H ¹⁶	9	56	30	9
Maha 1985/86	Dewahuwa ¹⁷	36	70	31	3
Maha 1986/87	Mahaweli H: Thoranagama ¹⁸	10	118	11	10
Maha 1989/90	Mahaweli System C ¹⁹	9	295	-	18 ^d
Maha 1991/92	Mahaweli System H ²⁰	15	229	17	30
	Mahaweli System G ²¹	45	96	52	12
	Mahaweli System C ²²	11	80	35	5

- Notes: n.a. Not available.
a. Data not disaggregated by crop-share/cash-lease forms.
b. Includes land shares informally given to family members for cultivation.
c. Holdings partially leased out.
d. Consists of tenants and caretakers for absentee owners.

- Sources: 1. University of Ceylon (1969), part 2.
2. Amerasinghe (1972), table 20, p. 66.
3. ARTI (1980b), p. 19.
4. Siriwardena (1981), p. 7.
5. Widanapathirana (1986), table 6.3, p. 57.
6. Wanasinghe et al. (1983), p. 36.
7. Gamage et al. (1988), appendix table 8, p. 123.
8. Krimmel (1986), p. 31.
9. Ibid.
10. Tilakasiri (1986), table 11, p. 12.
11. Wanigaratne (1984), pp. 139, 164.
12. Ibid.; Tilakasiri (1986).
13. Tilakasiri (1986), p. 12.
14. Talisman and Leonoff (1980), appendix 3.0.
15. Ibid.; Tilakasiri (1986).
16. Bulankulama (1986), p. 5.
17. Ibid.
18. Ibid.; Tilakasiri (1986).
19. Tennekoon (1991), p. 9.
20. PMU (1992), consolidated project statistics.
21. Ibid.
22. Ibid.

Michael Lipton (1985) posits that the different holding sizes determined upon ownership allotment may eventually move toward similar-sized holdings through informal land transactions. Both large and micro landowners tend to rent out, partially or totally, what they cannot cultivate themselves or consider uneconomic in view of rising costs. Small landowners and the landless, who seek access to land, hire out their enterprises and labor as cash and crop-share tenants. Thereby, they tend to rent in additional land. This means that initial disparities in holding size may gradually level down to a uniform, optimal holding size.

Transposing the above argument into the context of irrigated-settlement projects, one finds a diametrically opposed initial situation, where incoming settlers receive use access to equal-sized allotments through a permit given by the state. Therefore, the original condition is one of complete equity in holding size, along both ownership and operational terms, among a large mass of new settlers. Due to various intervening factors, the operational holding sizes change with time as settler family members, other settlers, and nonsettler investors are accommodated with land.

As generational pressure begins to bear upon the household resource base, particularly land, settlers are increasingly moved to accommodate their own families in their own land and its product. As this process gains momentum, the operational farm sizes, which in an intervening phase showed greater differentiation in operational holding size, gradually shift to a position of more equity. In essence, increasing accommodation of family members within a given extent of land gradually reduces the operational holdings to a position of nearly similar-sized micro plots. At this point, an equity in operational plot size is reached among the multitude of users of settlement lands. A maximum divergence also arises between the legally prescribed static equity in perpetual holding size among settler permit-holder "owners" and an informally prescribed equity in dynamic operational holding sizes.

This entire process, therefore, illustrates a tenure "transition" from an initial position of high equity in relatively large, owned and operated holdings, provided by the state through lease permits, to an evolved position of high equity in micro-operational holdings. Yet the static equity in relatively large-sized holdings achieved by settlers through a legally prescribed permit remains a settlement-tenure contradiction.

The process of tenure transition in settlement lands (permit holders) from an initial position of more owner-users to a subsequent status of more nonowner-users is considered to take about five to six decades to complete. This is accompanied by a transition from more cash- to more produce-based, informal land transactions and from more cash tenants and lessees to more produce-share family adaptations.

Evidence from empirical studies of settlement projects also points toward an apparent qualitative shift in forms of informal land transactions at different developmental phases (see table 3), which appears to substantiate the above hypothetical process. Dewahuwa, Uggal Kaltota, Kirindi Oya, and Padaviya (all of which are more than twenty years' old) have only a minuscule proportion of the settler population (3-4 percent) that operated paddy lands on a cash-lease basis. The Minneriya and Minipe projects, which were already thirty years' old

by 1967/68, showed that 22 percent and 44 percent, respectively, of their holdings were affected by both cash and produce-share leases. While the two land-transaction forms were not clearly differentiated on the two projects, observations made by others (Tenma et al. 1976; Wanigaratne 1979) imply that cash leases were associated with a smaller number of holdings than were produce-share leases. Apparently cash-based land transactions dominated the initial phase of settlement while produce-share-based land transactions were more prominent over the long run.

Immediately after settlement on holdings with a highly egalitarian size distribution, cash needs increase as settlers strive to establish themselves in a new environment. At this point, cash scarcity takes precedence over tenure security. Consequently, since land is the principal resource available (besides labor), the settlers are more prone to liquidate the land asset through informal cash-based transactions to satisfy their cash needs.

Thus, cash-based land transactions dominate the initial phase of settlement, which not only leads to an increasing divergence of usufruct from ownership but also results in an increasing divergence from the uniform-sized operational holdings provided by the state.

Nelson (1973) and Scudder (1981), theorizing on the evolutionary aspects of settlement-based development, postulate a linear upward progression beginning with a physical planning and resettlement phase, followed by an inevitable transition phase, a phase of settlement stabilization, and an economic "take-off" phase, and ending in a sustained development phase. In most settlement projects of Sri Lanka, however, such linear upward movement may not apply if the condition of subsistence maintenance and associated poverty prevails over the long run.

Consequently, this study posits the possible condition of "persistent poverty" in both early and later phases of the development of settlement projects. Seemingly, such a condition exists in spite of land and "ownership" integrities ensured through land laws and incentives for production growth introduced through state-sponsored support services.

3.5 TENURE AND CASH/NONCASH OUTPUT

The relationship in settlement projects between tenure status and cash output share cannot be conclusively determined from available empirical studies. Amerasinghe (1972, p. 81) recorded that in stages 1 and 2 of the Minipe project (Kandy District), tenants sold a higher portion (63%) of received output than did permit holders (51%) who operated their own land. An ARTI study (1975a, p. 70) conducted in Anuradhapura District showed that both tenants and permit holders in settlement projects marketed similar shares (70%) of their output.

Fixed crop shares (currently, 50-60 bushels per hectare) or cash (currently, 3,000-4,000 rupees per 0.4 hectare) are more popular as land rent in settlement projects than equal sharing of inputs and produce (for instance, the 50:50 sharecropping arrangements found in rain-fed and minor irrigation-fed village paddy lands). That tenants who are involved in fixed crop-share or cash-rental agreements may also dispose of a large share of their produce for cash

share or cash-rental agreements may also dispose of a large share of their produce for cash acquisition indicates that tenants in settlement projects may not be the purely landless or near-landless individuals found in the villages of the Wet Zone. Rather, they may be permit holders with capital who seek to expand their investment by taking on additional land. Nonsettler investors, too, using hired help, invest in direct production under such tenure arrangements.

Among such groups, which seek land under fixed-produce or cash-rental arrangements, the unmarketed share of their product probably reflects produce kept on hold in response to price movements rather than produce retained for personal consumption. The intent in seeking tenancies among these people would therefore be commercial activity rather than maintenance of subsistence. Field evidence, however, is lacking with respect to the issue of tenure and the ultimate disposal of both unmarketed share of output and cash received from marketed share.

In a general way, however, a review of literature on the agrarian situation in both settlement projects and districts shows that cash output as a percentage of total production is substantially higher in irrigated settlements and districts where settlement projects are concentrated than in areas where paddy cultivation is sustained largely under rain-fed conditions (see table 4). In the rain-fed areas, cash output as a percentage of total production averages approximately 26 percent, whereas in districts with concentrations of irrigated settlements (such as Anuradhapura, Polonnaruwa, and Hambantota), the share of the cash output is around 70 percent. In irrigated-settlement projects of the Dry Zone, however, the share seems to have increased since the early 1970s. Around 1977, for example, settlement projects reported a cash output share of around 46 percent. In the late 1970s, Mahaweli System H experienced a cash output share of about 35 percent. The estimated marketable surplus that could bring in cash, if sold, has increased from 47 percent in Maha 1982/83, to 53 percent in Maha 1983/84, to 55 percent in Maha 1984/85, and to 71 percent by Maha 1985/86. More recent information (1990/91) from Systems H and C also detail a substantial increase in the cash output share within a period of over a decade. During the 1990/91 Maha season, it was 66 percent in System C, 66 percent in System G, and 72 percent in System H. The marketable surplus in paddy in the Mahaweli Systems in 1994 was estimated at 83.3 percent (PMU 1994, Item 8, p. 1).

"Distress" sale of produce to defray spot cash needs appears to be quite pronounced in settlement projects. For example, Wanigaratne (1987, pp. 70-71) reports that in Uggal Kaltota distress sales during Maha 1982/83 accounted for 62 percent of the marketed surplus. The current noncash output share in settlement projects (estimated to be about 35%), if proportionately smaller than what it was ten years ago (around 60%) because of greater pressures for these emergency sales, should be reflected in household food intake and nutrition statistics and in the incidence of disease from dietary deficiencies. Nutrition statistics derived from a survey of the Mahaweli System H in 1980 documented that nearly 33 percent of the settlers suffered from "chronic malnutrition" (MPI 1980; Alexis 1985, p. 288). This level was close to the national average of 34.7 percent reported in a 1975/76 survey (MPI 1980, p. 5). The 1980/81 survey in System H also recounted that a condition of "acute undernutrition" was present among 19.6 percent of the settler population. This was

TABLE 4 Share of noncash output in paddy production: Evidence from rain-fed and irrigated-settlement locations, Sri Lanka

LOCATION/PROJECT	REFERENCE PERIOD	CASH OUTPUT AS % OF	NONCASH OUTPUT AS %
		TOTAL PRODUCTION	OF TOTAL PRODUCTION
Districts			
Kandy ¹	Maha 1971/72	38.4	61.6
<u>1</u>	Yala 1972	37.6	62.4
Anuradhapura ²	Maha 1971/72	80.0	20.0
<u>2</u>	Yala 1972	59.0	41.0
Colombo ³	Maha 1971/72	23.0	77.0
<u>3</u>	Yala 1972	22.0	78.0
Kegalle-Kandy ⁴	Maha 1971/72	22.0	78.0
Polonnaruwa ⁴	Maha 1976/77	70.0	30.0
Hambantota ⁴	Maha 1976/76	55.0	45.0
Irrigated-settlement projects			
Iranamadu ⁵	1967/68 year	61.0	39.0
Padaviya ⁵	1967/68 year	63.0	37.0
Allai ⁵	Maha 1978/79	62.2	37.8
Minneriya ⁵	1967/68 year	51.0	49.0
Gal Oya ⁵	1967/68 year	69.0	31.0
Minipe ⁵	1967/68 year	48.0	52.0
Hathwatuna Oya ⁵	1967/68 year	59.0	44.0
Rajangana ⁵	1967/68 year	36.0	64.0
Mahawilachchiya ⁵	1967/68 year	60.0	40.0
<u>6</u>	1967/68 year	49.0	51.0
Mahakanadarawa ⁷	Maha 1976/77	36.5	63.5
Pavatkulam ⁸	Maha 1976/77	79.0	21.0
Padaviya ⁹	Maha 1977/78	65.3	34.7
Vavunikulam ¹⁰	Maha 1977/78	31.0	69.0
Uggal Kaltota ¹¹	Yala 1977	44.0	56.0
Mahaweli System C12 ¹²	Maha 1982/83	51.5	48.5
<u>12</u>	Maha 1990/91	61.3	38.7
Mahaweli System H ¹³	Yala 1990	64.2	35.8
Mahaweli System G ¹³	Maha 1990/91	72.0	28.0
	Maha 1990/91	66.0	34.0

- Sources:
1. ARTI (1974b), tables 6-v and 6-vi, p. 101.
 2. ARTI (1975a), tables 6-vi and 6-vii, p. 69.
 3. ARTI (1975b), tables 5-vii and 5-viii, p. 50.
 4. Ranatunga and Abeysekera (1977), table 13, p. 19.
 5. University of Ceylon (1969), part 2.
 6. ARTI (1979a), table 7.4, p. 73.
 7. ARTI (1979b), table 7.1, p. 60.
 8. ARTI (1980a), table 7.3, p. 64.
 9. ARTI (1980b), table 7.5, p. 57.
 10. ARTI (1980c), table 7.2, p. 56.
 11. Wanigaratne (1984), table 6.6, p. 240; table 6.7, p. 250.
 12. PMU (1991), appendix tables 4a, 4b.
 13. PMU (1992).

significantly higher, on the other hand, than the national average of 6.6 percent calculated by the 1975/76 survey.

A recent survey (Sumanasekera 1990) reveals that in System C, 51.2 percent of children under 5 years of age were malnourished while 45.7 percent suffered from acute undernutrition. In Kotmale, 43.6 percent of the children were malnourished and 53.1 percent affected by acute undernutrition. According to these survey statistics, a total of 96.9 percent and 96.7 percent, respectively, of the children younger than 5 years' old in System C and Kotmale areas were considered malnourished. More recent statistics (March 1992) based on a weighing program of children under 5 years of age in all Mahaweli systems reveal that "nourished" children as a percentage of the total weighed remained low, at about 5 percent between 1990 and 1991. The malnutrition level remained high (52% in 1991) while the share of those affected by acute malnutrition declined by 0.5 percent between 1990 and 1991, to 42.5 percent. Medical records also reveal that "A-vitaminosis" and "anaemic" conditions among settlers are among the more prominent diseases in Mahaweli System H, C, and B.

The relationship may thus be hypothesized that while increases in cash output in both older and more recent projects are underlaid by distress sales, the older projects with their accommodation of larger family populations also suffer from the need to divide cash sums among family members and among a range of needs. Younger projects, which reveal high initial cash expenses incurred by settlers for initiation and stabilization of production and which are further affected by high incidence of leasing and mortgaging of land, are similarly affected by land and product fragmentation of a qualitatively different order. The distress sale of large portions of the output from fragmented operational holdings in these young projects may not yield cash returns adequate to defray such expenses. Further, a portion of the noncash output share probably moves to repay in-kind debts and to meet other obligations.

Concurrently, widespread indebtedness to formal and informal credit sources may be both a cause as well as a product of distress sales. De facto use of the land also deviates from the legally determined usership to include family members, tenants, lessees, mortgagors, and even persons to whom the land may be informally sold as beneficiaries of the evolved tenure base of settlement projects. For example, the Widanapathirana (1986, p. 15) study on the Gal Oya left bank settlements found that after three decades of existence, "the land tenure has also changed from owner operators to other operators such as *ande* (share tenants) mortgagees and lessees." An end product of the above hypothesized relationships, in both old and new projects, is probably an endemic deficiency in food intake and nutritional conditions among the large mass of settlers. Their household economy, investment behavior, and consumption patterns largely reflect traits associated with poverty.

4. CONCLUSIONS

On the basis of empirical data gathered from settlement projects in Sri Lanka, this paper examined the liberal notion, mooted by the Land Commission Report, that freeholder tenure promotes better land use. Freeholder tenure has been associated, in more developed

economies in other parts of the world, with the promotion of higher investment incentives, higher productivity, increased input allocation efficiencies, higher labor absorption, and new and more efficient use of technology. The empirical evidence presented by the current study, however, does not reveal a clear relationship between a higher assertion of rights in land and increases in productivity in the context of irrigated-settlement-based paddy lands of Sri Lanka. Land productivities under insecure tenancies such as encroachments and subdivided lands appear more or less the same as those under owned and operated holdings under perpetual lease. Further, holdings under perpetual lease in settlement projects reveal higher yields than those found within freehold lands under both irrigated and rain-fed conditions in the Wet and Dry Zones of the island. Clearly, the reasons for yield increases have to be sought from sources other than tenure. Water availability, fertilizer application, responsiveness of the crop, and edaphic factors appear to be more decisive in determining yields than the form of tenure rights held in land.

The relationship that higher concentration of rights to land promotes more intensive land use was not established by empirical evidence. Settlement-based paddy lands were more intensively cultivated, had more inputs applied, and had more new technology adopted than freehold lands associated with rain-fed or irrigated village-based paddies. The inverse relationship between holding size and intensification/yields was also not established over the range of operational holding sizes created through informal land transactions. There was no evidence that fragmented micro-operational holdings under various informal tenure arrangements used more inputs (including labor) than nonfragmented holdings which were owned and operated as integrated holdings under perpetual lease; nor was there any conclusive evidence that settler-owned and -operated holdings were more productive than those operated by share tenants, lessees, or mortgagees. Few studies note that holdings allocated to settlers seem to be below the optimum under the mixed-crop conditions required to maximize farmer incomes.

On the other hand, it was revealed that larger holdings, irrespective of their tenure form, tended to receive higher incomes because they made better use of technical inputs, including water. Evidence from irrigated-settlement studies tended to point to larger holdings as better producers which yielded higher incomes and labor use. By implication, in a settlement context which prescribes a holding-size uniformity around smallholdings, land accumulation was judged to be beneficial since it paved the way for economies of size to be realized in larger operational holdings under the paddy crop. Whether this would hold true in the case of other field crops (OFC) or mixed farming with livestock, however, remains largely speculative in view of the lack of corroborative empirical evidence.

Informal processes seemingly recreate in settlement lands a condition of tenure and holding-size flexibility that is usually associated with freeholder lands outside of settlement projects. However, qualitative differences exist between them as to the nature of tenure and holding-size flexibility.

Many perpetual leaseholders in settlement projects who are involved in land transactions respond to an informally driven demand for land more or less in the same manner as

freeholders do in paddy lands outside of settlement projects. Empirical evidence from settlement and village-based irrigated and rain-fed paddy lands, however, reveals that tenure forms based on cash transactions (for example, cash leases, mortgages, and sales) are higher in settlement lands than elsewhere. This is related to the higher investor demand for irrigated-settlement lands, with their better access to water, technical advice, credit marketing, and input-delivery facilities. Thus, settler lands are share-cropped, leased-in, mortgaged-in and mortgaged-out, and sold, and family members are informally accommodated in the settler land and its product. Settlement lands with their relatively larger operational holding sizes and better access to facilities yield higher returns and thus absorb higher user populations than village-based paddy lands.

In Sri Lanka, operational fragmentation of lands and range of holding sizes are found both in and out of settlement lands. However, laws that apply to lands outside of settlement projects recognize fragmentation and range of holding sizes as results of inheritance and the operation of a land market; the special laws that govern settlement lands restrict the fragmentation of holdings to a minimum. The alienated holding sizes usually do not reveal wide variations within individual projects. Informal processes, however, introduce higher flexibility, resulting in a wide variation in operational holding sizes. At the same time, these processes prevent excessive fragmentation by prescribing more flexible limits, which are largely conditioned by settler perceptions of holding size "viability" based on subsistence needs of family members.

A complete commercialization of agriculture as a desired state of economic growth and well-being is dependent on the presence of market flexibilities in land, labor, and technology. While labor and technology have attained some degree of elasticity in settlement-based agriculture, their total impact on productivity is probably retarded by legal rigidities imposed on the tenure base of land.

Yet informal land transactions have provided some relief by introducing an element of market flexibility into the land resource. Through this medium, market forces have infiltrated the land base, thus broadening access to land as agriculture becomes commercialized. The presence of the land laws, however, distorts the land market such that most land transactions develop exploitative tendencies; this hinders the best use of the land by owners as well as by users.

It is probable that informal but complex land transactions (involving share tenancies, leases, mortgages, and land sales) also displace inefficient cultivators. Presumably they are replaced by investors who manage the land on a higher commercial basis than before. It is argued, however, that increasing accommodation of settler family members in land as settlement projects grow older will marginalize these informal transactions. Whether this will continue in the current liberalized economic climate, which is anticipated to expand, is uncertain. It is likely that private entrepreneur and merchant capital investment in settlement land and resultant large-scale farming will increase as the economy demands cheap food and agricultural raw material supplies to assist industrial and commercial growth.

It is not certain whether informal land-market flexibilities are associated with a higher degree of risk and uncertainty for investors. Where a patron-client relationship has become established between the settlement management bureaucracy and the settlers, as is found in most settlement projects in the island, it is possible that individuals seeking to invest in settlement lands do not face substantial risks even in the presence of land laws that forbid such transactions.

The presence of informal land transactions also signifies that market forces cannot be dampened by mere legal restrictions placed on the free transfer of the land resource. Therefore, a case exists for legal recognition of the forces responsible for informal land transactions and for strengthening the bundle of rights held over settlement lands by their users. In essence, freeholder titles should be conveyed to those who already own and have access to land through perpetual lease and restricted grant permits; such titles should be conveyed even to others who have completely taken over the land from those settlers who have informally relinquished their use rights to land.

Whether granting full ownership to these lands would remove prevailing production, employment, and income-generation problems based on investment in land is debatable, however. The weight of empirical evidence from other countries in Southeast Asia favors granting full ownership of land to users as a means by which:

- (1) inefficient users are displaced from the land base and are absorbed into other sectors of the economy;
- (2) investors with higher management capabilities and capital are attracted to invest in direct production, thereby establishing a more commercialized agricultural base; and
- (3) a long-term shift in land use is promoted toward a position of best use of land which will bring both private and public welfare.

In Sri Lanka, however, such a position must be accompanied by compressed development of other sectors of the economy such as manufacturing and services. As land use becomes technologically efficient, labor and other resources that may be displaced from agriculture must be absorbed by other sectors of the economy. This could lead to optimal use of resources for economic growth and social welfare.

Currently, Sri Lanka does not have such strong intersectoral development. In its absence, the social cost of granting freeholder rights over settlement lands may well enlarge the underclass of landless labor, which maintains itself largely on the current productivity of the land base. The land base itself appears to have reached a productivity plateau in the last decade.

The implications of legally backed land-market flexibilities created within prime food-producing lands, upon which depend a substantial segment of the rural poor for their food and income security, also cannot be overlooked. Recent studies show that acute poverty and malnutrition are more widespread in settlements than hitherto believed. One important issue is whether freeholder status for current users of settlement land would result in land accumulation by nonsettler investors who already have gained access to settler lands and

direct production. A land accumulation of significant proportion would increase the disparities between those who have and those who do not have access to current and future income streams.

Freehold tenure in lands outside of settlement projects has led to problems such as a proliferation of co-ownership of undivided shares. Berugoda (1978, p. 20) estimates the incidence of undivided shares in freeholder lands of the Wet Zone at about 50 percent of the total extent of privately owned lands, or 63 percent of Wet Zone smallholdings. West (1986, p. 11), quoting from a personal communication, places its incidence between 33 and 50 percent. While co-ownership through tenure forms such as *tattumaru* also sets limits to continuing fragmentation, it nevertheless has resulted in increasing the volume of land disputes and partition actions. It is considered to lead to a general neglect of affected lands while it also impairs access to capital for prospective developers of land.

The current failings of freehold tenure in lands outside of settlement projects must also be related to the failings of existing laws of inheritance with respect to private lands, which, for instance, uphold deeds rather than title registration. Registration of deeds has been known to affect incentives to invest in land as well as to prolong settlement of land disputes because of procedural delays.

This study, however, takes a stand that was initially adopted by Farmer (1960), who held that problems of tenure in settlement projects must be viewed in the context of failings in the overall economic policies in the island. As a consequence, manufacturing, trade and commerce, and service sectors have not developed to a position where they would begin to absorb surplus labor from land and private investment from land and direct production. This in turn would lead to a process of lessening the "preoccupation with land." Therefore, it may not be a failing in the freeholder tenure form per se, but a failure of the overall economic policies and existing land laws to create a setting in which the full potential of freeholder tenure could be realized.

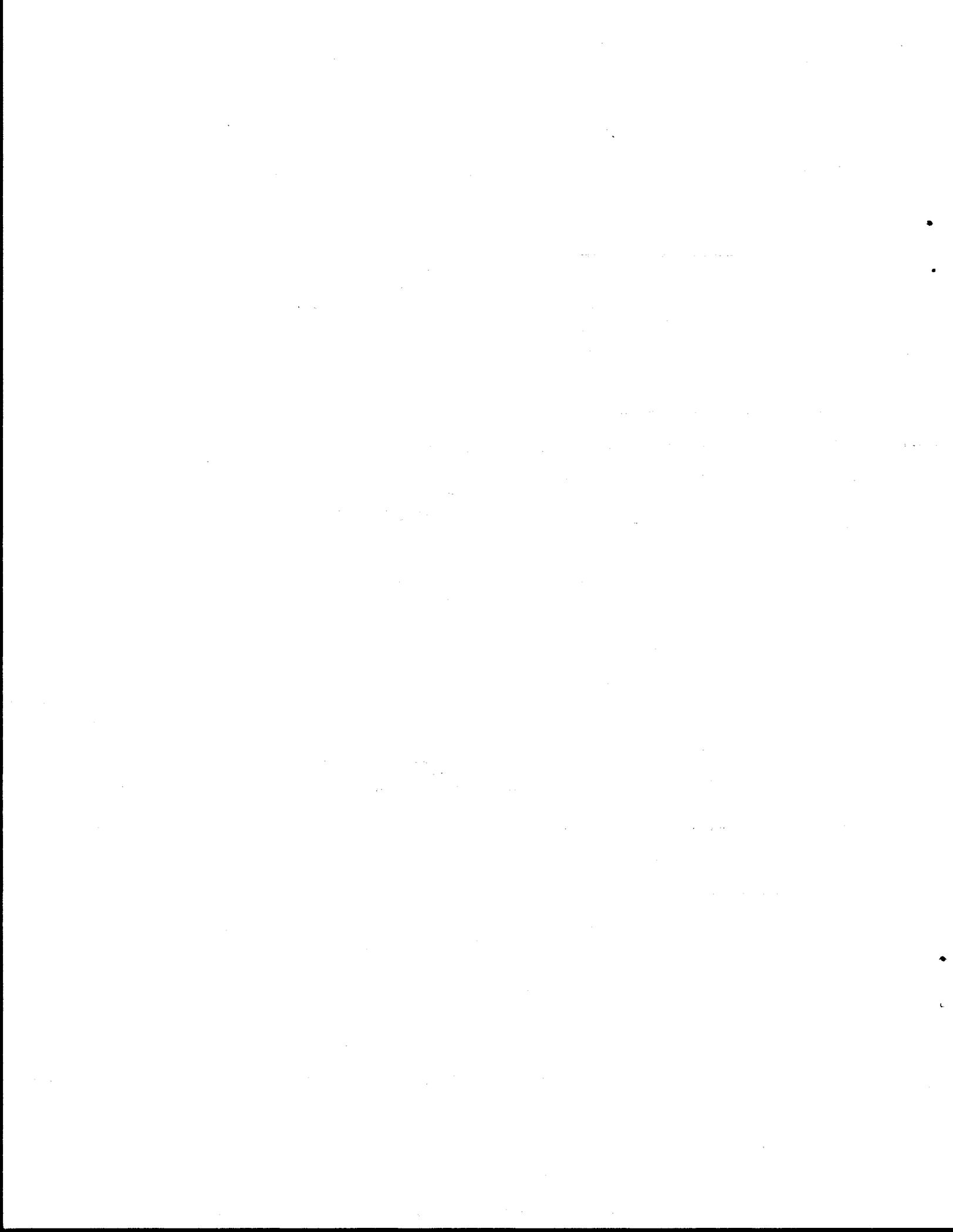
Therefore, the introduction of freeholder titles to land must necessarily accompany a simultaneous development of the technological and support-service base for agriculture to exploit the benefits of freeholder tenure in settlement lands. Other sectors of the economy must be developed concurrently so that they can absorb the substantial short-term social costs of the creation of land-market flexibility in the settlement-based sector of agriculture.

Thus new amendments to the 1935 Land Development Ordinance that have been introduced in the 1990s (viz. Amendments of March 1993 and June 1994), while expected to promote better uses of settlement land, also pose large social questions. These must be carefully addressed, a priori, as to their implications on the future directions of the economy and polity of rural Sri Lanka. Issues such as the importance of large commercial holdings, which may bring in economies of size, and alternative and better uses of land, which may bring higher returns, should also be addressed within a context of large populations in settlement projects, their future growth, and the current and expected well-being of settler populations. On such deliberations lie the ultimate choice of strategies that are expected to

bring economic growth with distributional equity to the settlement-based rural areas of the country.

Most academic and policy deliberations on the feasibility of freehold tenure for both smallholders and large farms in irrigated settlement projects continue to be conducted upon a weakly substantiated base of empirical research. Settlement projects are usually seen as technical problems which pertain to irrigation management and production. However, problems associated with tenure rights of access to land, which determine both the growth and the benefit-distribution aspects of production, appear more fundamental. Since irrigable land is as scarce a commodity as irrigable water, a higher understanding of what goes on in the irrigable land resource, which includes tenurial relationships, is considered vital for settlement policy planning.

The realities of the land base appear complex, with possible lasting negative implications on the economic well-being of settlements. Therefore, this study urges immediate development of a national program of tenure research which could provide a more reliable database. This will allow conclusive responses to be found to the many tenure-based questions and issues based on current and anticipated access and use of settlement lands.



ANNEX

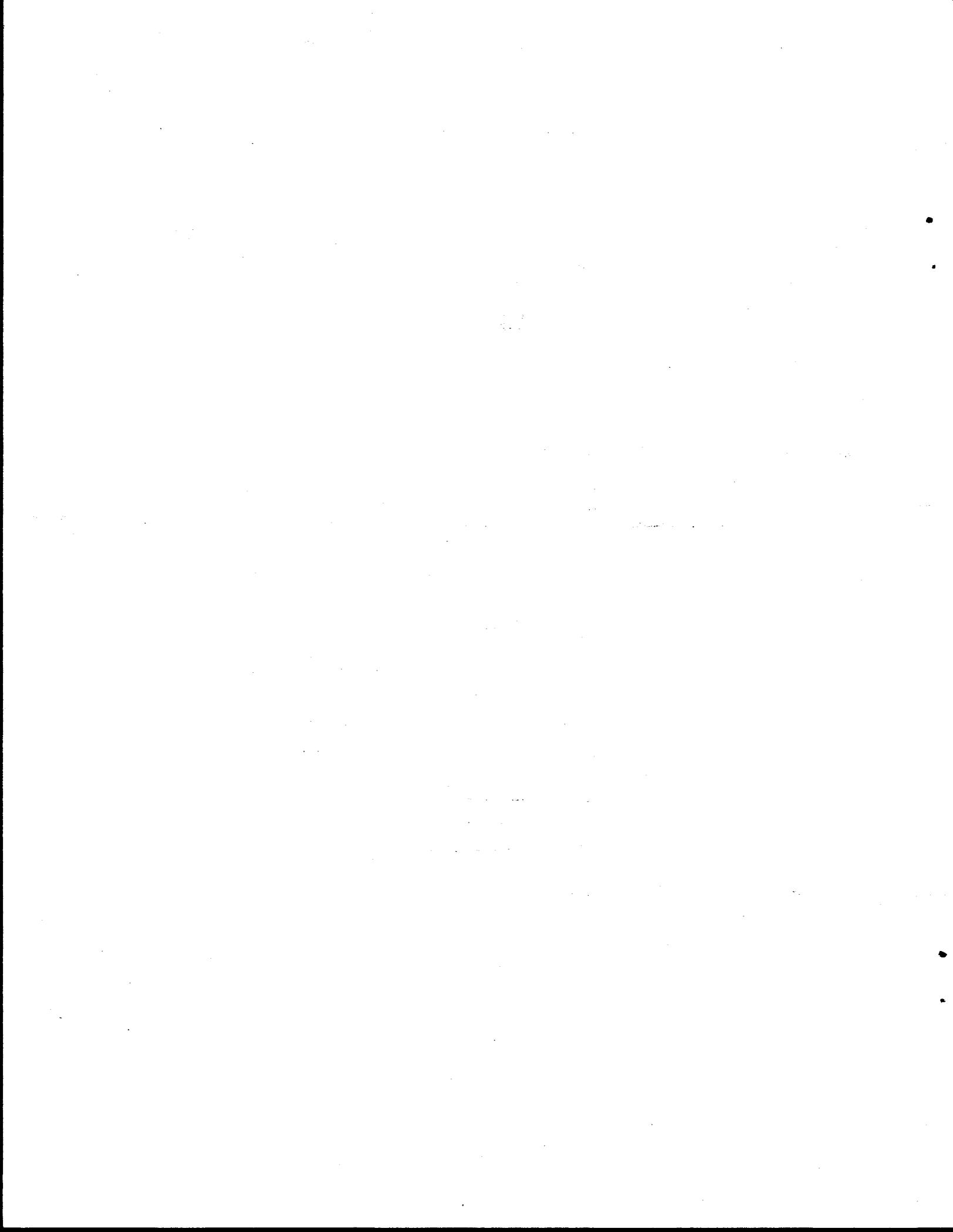
Absolute and relative poverty conditions in selected irrigated settlement projects

PROJECT	REFERENCE PERIOD	AGE OF SETTLEMENT WITH RESPECT TO REFERENCE PERIOD (years)	RELATIVE OFFICIAL POVERTY LINE	ABSOLUTE POVERTY LINE CONDITIONS (% of settler households)	RELATIVE POVERTY	
					Share of lowest 30%	Total income highest 10%
Mahawilachchiya ¹	1976/77	21	300	47	10	19
Minipe ²	1976/77	39	300	8	7	16
Mahakandarawa ³	1976/77	15	300	26	8 ^c	29
Mahaweli Sys. H ⁴	1977/78	1	300	66	-	-
Pavatkulam ⁵	1977/78	20	300	31	13	32
Vavunikulam ⁶	1977/78	9	300	7	12 ^c	28
Padaviya ⁷	1979/80	20	300	7	18	27
Kirindi Oya ⁸	1979/80	1	300	43	7	40
Mahaweli Sys. H ⁹	1979/80	9	300	61	-	-
Kirindi Oya ¹⁰	1981/82	2	440	51	-	-
Kaltota ¹¹	1982/83	18	440	42	5 ^d	25
Mahaweli Sys. H ¹²	1983/84	7	440	29	-	-
Mahaweli Sys. C ¹³	1984/85	4	440	3	15	20
Kirindi Oya ¹⁴	1985/86	6	700	55 ^a (4.6) ^b	2.4 ^a	10 ^a
Kirindi Oya ¹⁵	1986 Yala	7	700	1.4 ^a	-	-
Mahaweli Sys. C ¹⁶	1988 Yala	6	700	2	16	20
Mahaweli Sys. B ¹⁷	1988/89	7	700	6	13	22
Mahaweli Sys. C ¹⁸	1989/90	9	700	9	10	27

- a. Old irrigated areas. c. Lowest 25%.
b. New irrigated areas. d. Lowest 20%.

Note: The low absolute and relative poverty values at Kirindi Oya (new irrigated areas is a result of income-subsidizing effects of World Food Aid distributions rather than of overall improvements in income distribution due to the economic progress of the project). The low absolute poverty conditions in Mahaweli System C and B reflect upon the relatively below-placed food-crop economy and perhaps better living conditions than in other projects of comparable age.

- Source: 1. ARTI (1979a), 6.14, p. 58.
2. Wanigaratne (1979), tables 8 and 9, p. 21.
3. ARTI (1979b), annex 3, p. 60.
4. ARTI (1979c), table 6.3, p. 50.
5. ARTI (1980a), annex 2, p. 76.
6. ARTI (1980c), table 6.12, p. 49.
7. ARTI (1980b), appendix 1, p. 70.
8. Wanasinghe et al. (1983), p. 38.
9. As quoted in Ekanayake (1985), p. 7.
10. Tudawe (1986), p. 32.
11. Wanigaratne (1984), table 5.10, p. 256.
12. Silva (1985), table x.
13. Samarasinghe (1986), table 5.19, p. 55.
14. Wanigaratne (1986), table 7, p. 212; table 8, p. 213.
15. ARTI (1988), table 2.11, p. 25.
16. Hettiarachchi (1988).
17. PMU (1989/90), MARD basic data sample.
18. Wanigaratne et al. (1991), pp. 31-36.



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