

Heterogeneity, Commons and Privatization: Agrarian Institutional Change in Goa

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Abstract

In the debate on resource management, asset re-distribution and privatization of commons have emerged as contentious issues. This paper uses a case study in Goa to examine whether tenure security and asset re-distribution can lead to environmentally sustainable outcomes. The paper concludes that when public policy involves institutional transition, there may be tradeoffs involved between equity and sustainability. Institutional change can affect social networks by triggering exit of agents who previously managed land. Due to lack of a prior history of cooperation among the new resource owners, the new equilibrium may shift to a non-cooperative regime that might be unsustainable in the long run.

Key words: Common property resources, embankments, comunidades, institutions, heterogeneity, cooperation.

Heterogeneity, Commons and Privatization Agrarian Institutional Change in Goa

Pranab Mukhopadhyay

1. Introduction

This paper attempts to address two related questions in the context of agrarian transitions in Goa, a small western state in India. At the time of Goa's Independence from Portuguese colonization in 1961, a major part of Goa's agrarian lands was owned and regulated by a community institution called the *comunidades*. In 1964, the government brought in Land Reforms through the Tenancy Act (1964) and Rules (1965) which gave security of tenure to tenants and attempted to make land occupancy equitable. Subsequently, tenants were given the right to purchase land at fixed rates as per their convenience to convert their tenancy claim to ownership rights. This amounted to virtual privatization of the *comunidade* lands, which were till then common property in the classic sense of the term.

This paper therefore addresses the following two questions:

- (a) What is the impact of heterogeneity in asset ownership on cooperation? Does a more equal ownership of (agricultural) land make agents (cultivators) more amenable to cooperate on matters pertaining to productivity improvement ?
- (b) Does privatization of commons lead to greater sustainability? By ecological sustainability we mean the maintenance of recovered lands in their current ecological status of agricultural land use and by conservation we imply undertaking protective measures (embankment maintenance) from unintended flooding by tidal waters (similar to Holden, Shiferaw & Wik 1998). Will privatization of commons lead to better soil conservation measures and maintenance of agricultural lands ? By soil conservation we mean better measures to control soil salinity particularly embankment maintenance in this case.

In Goa, most of the paddy cultivation is on 'recovered' lands (*khazans*) and a large section of these lands in the coastal zones were under the control of the *comunidades* prior to 1961 when Goa joined the Indian union. In 1964, tenancy legislation was introduced which gave security of tenure to tenants but in the process also paved the way for privatization of the *comunidade* lands. The empowerment of the tenants and disenfranchisement of the *comunidades* had ecological implications since embankment maintenance which was done by *comunidades* now was neglected leaving the fields open to salinity ingress.

We find that on the one hand the new resource owners were unable to cooperate to finance public investment and on the other there was an exit mainly of gaunkars who

were the resource managers under the previous dispensation. The increase in reported fallows due to salinity indicates declining sustainability in this region.

In the following section 2, we examine the existing theory on cooperation and sustainability followed by a discussion in section 3 of transition in local institutions in Goa. In section 4 we present results of our primary survey with an econometric model of exit and the paper ends with a discussion on the findings.

2. Heterogeneity, Cooperation and Sustainability

Communities with extreme inequalities or very homogenous distributions of wealth are often seen to exhibit greater cooperation than others and a Kuznets(-like) relationship could exist between inequality and conservation.¹ The so-called “Olson effect” is valid to the extent that threshold effects exist in wealth holding. Anyone below a certain threshold level of wealth will not cooperate, irrespective of what others do. Beyond the threshold level of wealth holding, cooperation could emerge if agents find others cooperating too. However, the proportion of those below the threshold is crucial for cooperation story which would break down if the proportion of those below the threshold is high (Dayton-Johnson & Bardhan 2002).

On normative grounds asset re-distribution may be desired, but what is also of concern is the ecological consequences when endogenous institutions are replaced by new inorganic ones wherein the incentives for conservation may not be optimally configured (Jodha 1980, Mukhopadhyay 2002b).

The impact of such changes is compounded when there are strong incentives and opportunities for exit. For example, after land redistribution or tenancy reform, alternative economic opportunities may emerge that entice the farmer off the field. Agriculture may no longer provide a sufficient incentive to the new beneficiaries while the old owners stand disenfranchised. This might defeat the very purpose of tenancy reform (to increase efficiency of farm output) as the gainers in the redistribution may have reduced incentives in farming. The growth implications are that it might impede adoption of new technology and thereby lower the long run growth path.

Even if one were to keep issues of institutional change and property rights structures aside for a moment, asset redistribution in the presence of non-convexities could reduce productivity. If the technology is such that it involves high initial costs, small farmers in the presence of an imperfect credit market may not be able to bear these costs and

¹ The Kuznets curve (relationship) originally examined the problem of inequality and economic growth of nations. Empirical evidence collected by Simon Kuznets suggested that at very high and low levels of inequality the rate of growth was lower than in the intermediate range. The Kuznets inverted-U relationship has since been borrowed for use in debates on environment and a similar pattern is suggested vis-à-vis the relationship between inequality and conservation of natural resources especially in the context of common property resources.

therefore get trapped in a low productivity cycle – the so-called Olson effect (Baland & Platteau 1997).

It must be noted here that a large part of the above debate is in the context of privately owned resources – redistribution of land already in the private domain. However, we now join issue with the second question that drives this paper, what happens when we privatize common property ?

2.1 Privatization and the Commons

The property rights school has argued that when commons have associated externalities, privatization would be the best solution because it would enable the resource owner to internalize all the costs and benefits (Demstetz 1967). This obviously is an efficiency enhancing argument because public (and resource) economics has struggled to suggest policy instruments to achieve this without privatization. The external costs which are not accounted for under community ownership are expected to be internalized under private ownership – especially individual ownership. And, of course, it does not matter who owns the resource because it would not affect the equilibrium outcome (Coase 1960).

The literature, however, is aware that there are numerous situations where privatization would not lead to efficiency gains. If contracts are incomplete, it could loosen co-operative bonds and thereby reduce the extent of efficiency gains (Seabright 1993). This could happen in two ways. One it could reduce the mutual social interdependence that creates cooperation (Ostrom 1990:38). Second, since property subsequent to privatization becomes tradable, it makes agents less interested in long term co-operative behavior, and people put in less effort to build up cooperation (Grossman 2000). Under such conditions, a self-governing local community with commons might have a more efficient production locus than if private property was established.

This of course brings us to the question that when we are targeting homogeneity, and it is done through privatizing the commons what would be the likely outcome especially in the context of ecological sustainability (Baland & Platteau 2003, Dasgupta & Maler 1995, Janvry et al 1999, Knox & Meinzen-Dick 2001)?

The neutrality theorem suggests that a change in asset distribution should not affect the provision of public goods. This is however dependent on two crucial assumptions — the public good is pure such that all have equal access to the good and all agents contribute irrespective of asset changes. If the redistribution actually increases the number of contributors then the supply of public goods will increase and on the other hand if number of contributors decline then supply will decline (Bergstrom, Blume and Varian 1986).

The importance of this for CPR management is crucial for two reasons. We need to understand whether asset distribution increases the number of contributors to the public good or does it lead to its reduction. If the distribution leads to greater homogeneity in

asset ownership but leads to a reduction of contributors (increase in number of free-riders) then the resultant situation though socially desirable in terms of the homogeneity goal would not be ecologically sustainable. This is a possible outcome when there is a decline in “institutional supply” (Ostrom 1990 and Becker & Gibson 1998) simultaneous with the redistribution.

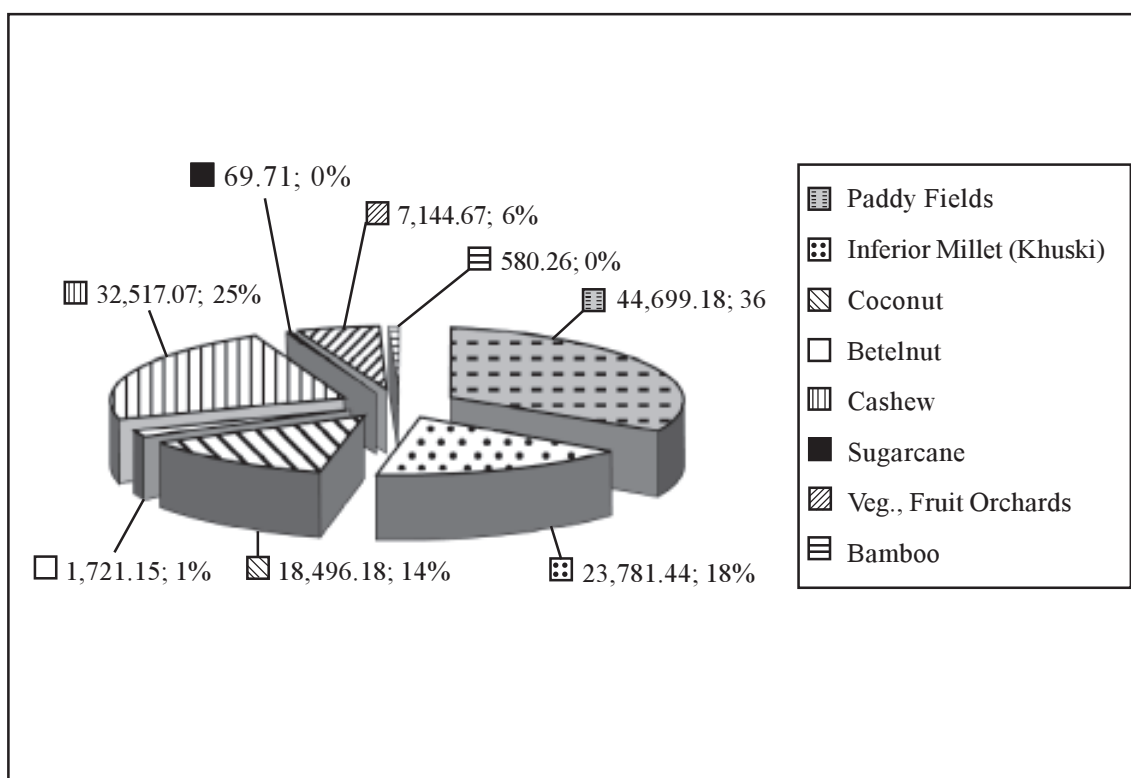
We address these questions in the context of the agrarian institutional transition in Goa, a small state in Western India, which was one of the earliest (and last) European colonies in India (1510-1961). The issues that we focus on relate to the impact of inequality on cooperation and of privatization on efficiency and sustainability. In the following sections, we describe the history of agrarian institutions, their transition through the post-colonial phase and examine the impact of Tenancy legislation on the Land management system. The historical material is collated from existing secondary literature on Goa’s history.

3. Agrarian Organization in Goa

Goa has a long history of community land ownership and management. A large part of the state’s “recovered” lands and hill tracts were owned by a community institution called the *Comunidade* (or *gaunkarias*). The original settlers of the village were called *gaunkars* and male descendents were given that title on reaching adulthood in the system. They jointly lay claim to the ownership of village lands and cultivated them by distributing lands through periodic auction. Auction rents were used for maintenance of the embankments and sluice gates (soil protection public works) among other things like dividends to the gaunkars (Pereira 1981).

Soon after the liberation of Goa in 1961, the government appointed a Land Reforms Commission (February 28, 1963), which submitted its report in 1964. It recorded that a large proportion of the agricultural land in Goa continued to be held under the *comunidade* approximately 33% of the area (129,009 hectares) under paddy cultivation (Table 1 and Graph 1). This amounted 65% of the net sown area in Goa and in coastal areas it was nearly 92%. In the *talukas* (*concelhos*) of Goa (now known as Tiswadi *taluka*), Salcette, Bardez, and Mormugao, where lies the largest concentration of the area under paddy, the *comunidade* owned more than 50% of the cropped area (Table 1) (GoG 1964a: 12 & 20).

Graph 1: Type of Cultivation in Area (Hectares & Percentage) Prior to Land Reforms



Source: GoG 1964a:12.

Table 1: Distribution of Land Under Private and Comunidade Ownership (Prior to Land Reforms)

	Taluka	Total Area under Paddy cultivation (in Hectares)	Paddy Area under comunidades	% under comunidades
	Goa	44698	14765	33.0
	North Goa	23553	8624	36.6
1	Ilhas	6398	3569	55.8
2	Bardez	6664	3764	56.5
3	Pernem	3504	0	0.0
4	Bicholim	2599	548	21.1
5	Satari	1609	1	0.1
6	Ponda	2779	742	26.7
	South Goa	21145	6141	29.0
7	Sanguem	2422	90	3.7
8	Canacona	2682	42	1.6
9	Quepem	4838	195	4.0
10	Salcete	10184	5207	51.1
11	Mormugao	1019	607	59.6

Source: GoG 1964a:16.

This is also the area of the Old Conquest, where the Portuguese colonization was the longest and the Rules and Regulations regarding the *comunidades* got codified.² The New Conquest areas which became part of the Portuguese colonial territory after a gap of almost two centuries (in the 18th century) did not see a similar preservation of *comunidades*' functionality. There were historical distortions to natural evolution, for example, Pernem the taluka was handed over to the Ranés to defend Goa from the aggression of Marathas (neighbouring rival kingdom).

3.1 History of Land Management

Documentation on the *comunidades* for the colonial period indicates that these village level institutions played a very important role in the agrarian economy of Goa. Some argue that till not so long ago, the entire agricultural area was owned by the *comunidades*. The process of creation of private cultivable lands happened mainly during the Portuguese period when land grants were made by the colonial state to expand its support base and in later decades (1540 onwards) when the Portuguese crown undertook inquisition in all its colonies to encourage religious conversion (D'Costa undated: 46).³ The financial buoyancy of the *comunidade* depended on the productivity of its lands, their main source of revenue and its outgoes. Table 2 below summarizes the incomes and expenditures for the period 1954-63 under different heads undertaken by the *comunidades*.

² The Portuguese colonization which began in 1510 was in two distinct phases in Goa. The Old Conquests (Velhas Conquistas) included the conquest of the areas of Tiswadi, Mormugao, Bardez and Salcete. The New Conquests (Nuovas Conquistas) was separated by two centuries (late 18th century — between 1763 and 1788) when Ponda Quepem, Canacona, Pernem, Sattari and Bicholim came under the Portuguese rule (Xavier 1993).

³ Afonso de Albuquerque who established the Portuguese colony in Goa (1510) encouraged inter-marriages between Portuguese soldiers and widows of slain Muslim and Hindu soldiers. Villages which made land grants to these couples were allowed to forgo their *coxi vordo* (voluntary contribution to the king). Prior to this, private ownership of land was limited to the house plot (Xavier (1993): 7). The second big boost to private property in Goa was at the time of the Inquisition (1541). The state confiscated all lands of temples, and those who refused to convert or conform to the edicts of the Inquisitorial authority. The confiscated lands were distributed among Christian missionary institutions for economic support and new converts to seek their co-operation.

Table 2: Main Sources of Income and Expenditures of the *Comunidades*:

Main Income Categories	Period 1954-63	Main Expenditure Categories	Period 1954-63
Rent from lessees of agricultural lands	86%	Land Tax	18.5%
Foro (Form of rent) and income from auction or lease of fishing rights, salt pans, etc.	11% approx	Administrative Expenses	20-27%
		Expenses on ordinary and extra-ordinary works - construction and maintenance of bunds, sluice gates	16%
		Contribution to Juntas de Fregusia (Village Associations)	5%
		Contribution of charity, churches and temples	6%
		Jonos (dividends) to members	16%

Source: GoG 1964a:39 & GoG 1967a:59-63.

3.2 Institutional Transition

In 1964 the government enacted the Goa Tenancy Act, which took the powers of land auction out of the hands of the *comunidades* and transferred the responsibility for embankment maintenance to tenants. It provided for security of tenure for the tenants and through subsequent notifications and the issue of Rules and Regulations (1975) gave the tenants the right to buy land at a low fixed price from the *comunidades*.⁴

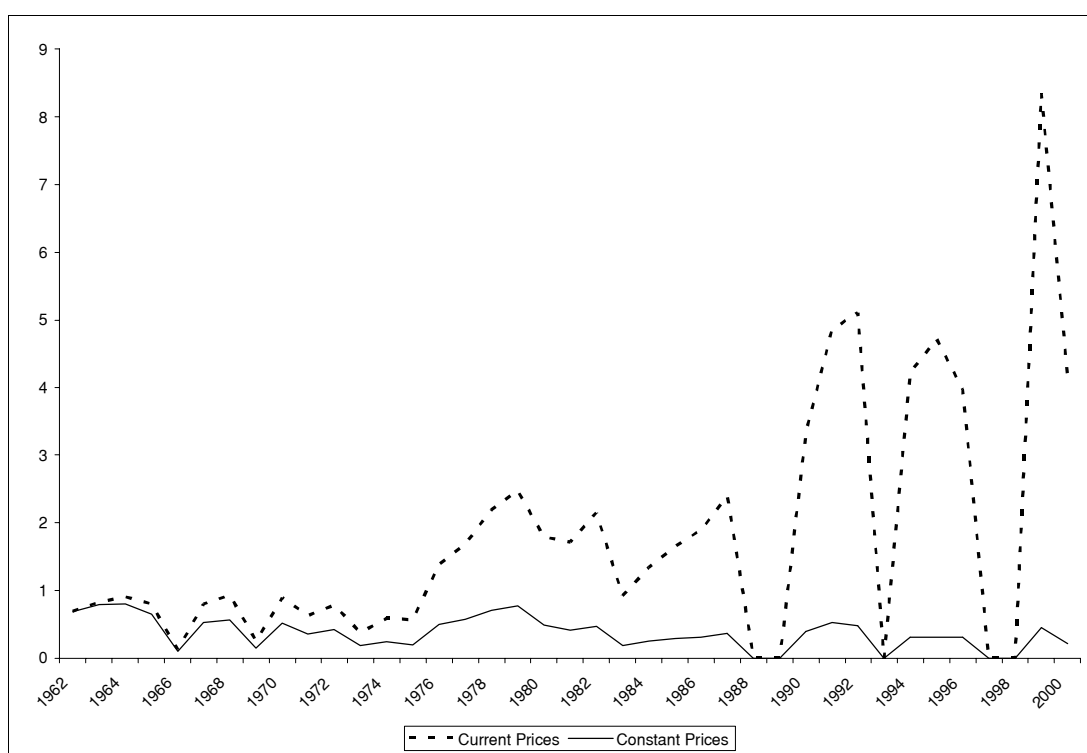
Importantly, simultaneous with the tenancy reform there were into effect an institutional transition from one form of local self-governance – the *gaunkaris* (or *comunidades*), to another form (the *panchayats*) which created incentive-incompatibilities (Mukhopadhyay 2002a). We believe that the much-talked about effectiveness of local self-government in the form of *panchayats* to undertake ecological sustenance has been put to test in Goa. Since the *panchayats* in all rural areas in Goa issue licenses for construction, there has been large-scale land conversion in the coastal zones (Alvares 2002). Construction fees and licenses contribute to the bulk of their finances, and therefore the institutional imperative to encourage construction which are mainly of non-agricultural in nature (Mukhopadhyay 2005b).⁵

⁴ It also reduced the rent to one-sixth of the last auctioned value prior to the Tenancy Act. Currently, tenants are reportedly not paying even this rent to the *comunidades* since they can not be evicted.

⁵ The following talukas cover the coastal zone of Goa – Bardez, Goa (Tiswadi), Salcete, Mormugao, Canacona and Pernem.

The government presumably realized that with the reduced financial capability of the *comunidades*, the soil conservation and productivity-enhancing activities of the *comunidades* including maintenance of embankments, de-silting of rivulets, etc. had to be undertaken by a different agency. The *comunidades* used to undertake these activities out of the profits earned from the public auctions of cultivation rights.⁶ Now that there were little or no revenues accruing to the *comunidades* they would financially incapable of undertaking these activities.

Graph 2: Government Expenditure incurred in Embankment maintenance (in Rs Million)⁷



Source: GoG (Various Years)

In 1958 the Portuguese government had constituted a “Bunds Committee” to oversee the maintenance of embankments which oversaw the expenditure of an estimated Rs 8,34,400 in the two years prior to liberation to bring back into cultivation about 959 hectares of land. Even after liberation, this committee spent considerable sums in the first few years (GoG 1967a:247-8). It was replaced by the Soil Conservation Division

⁶ The taluka-wise expenditure and income statement of Comunidades (In Rupees for the period 1954-1963) is provided in Table 11 (Appendix 1) to give a measure of their financial bouyancy. Table 2 earlier shows the main heads of incomes and expenditures.

⁷ The following must be noted about Graph 2. Expenditure figures for certain years were not available and these have been shown by default as zero in the diagram (1988, 1989, 1993 1997 and 1998). Secondly, for the years that data was available, the figures were only in current prices. Since price indices going back to 1962 were not available nor was there a SDP deflator for this period we used the GDP deflator for India using 1962 as the base year (i.e. deflator = 100 in 1962) to calculate the expenditures in current prices.

in 1969 which was made responsible for maintenance of embankments (GoG 1992:55). It was created with the purpose of assisting tenants who may not have the financial strength to execute large repairs. The total expenditure (in current prices) on embankments has gone up from Rs 0.69 million (in 1962) to Rs 4.16 million (in 2000) while the area protected by bunds has remained the same on a point to point basis though there are inter-year variation, see Graph 2 above. However, when these expenditures are measured in real terms, the actual expenditure on embankments has declined. This is a further indicator that the state of maintenance is getting worse.

Section 9 of the Agricultural Tenancy Rules (1975) details the process of execution of repairs. The Managing Committee of the Tenants Association was empowered to undertake any immediate repairs without calling for auction of works as long as the amount did not exceed Rs 500 and the Mamlatdar (who is the executive and quasi-judicial authority at the sub-district taluka level) and Soil Conservation Division were informed of the same within 24 hours. If the expected expenses exceeded Rs 500, then all the work had to be routed through the Soil Conservation Division upto an amount Rs 5000. If the expenses were beyond Rs 5000 but less than Rs 10,000 then prior sanction had to be obtained from the Development Commissioner. The Mamlatdar, on execution of the work is expected to recover a portion of the expenses from the beneficiary farmers through the Managing Committee of the Tenants Associations. In case the tenants do not agree then the Soil Conservation Division/ Mamlatdar were the deciding authority. The designated public authority for overseeing public works on the embankments is the Mamlatdar (GoG 1964).

It has been pointed out by some that the discovery of iron ore deposits in Goa's hinterland (in early 1950s) had a direct impact on embankment maintenance. The decline in tree cover in the upstream areas led to increased top soil run off in the mining areas and this was deposited at the river mouth (called "sand barring") causing increased tidal movements. Secondly, the barges carrying ore from the mines to the Mormugao port increased wear and tear of the embankments abetting saline inundation (Alvares 2002). This being a new development in the 1950s, the government gave concessional loans (@ 2% payable in 10-15 instalments) for repair of embankments (GoG 1967a:247-8).⁸

Section 42A of the Goa, Daman and Diu Agricultural Land Tenancy Act (1964) outlines the procedure for discharge of joint responsibility of tenants wherever any "conservancy, maintenance or repair of any bund, embankment" work involved more than one tenant and states that the government would frame appropriate rules for regulating the same.

⁸ The official agricultural efforts and concerns prior to liberation in 1961 can be perceived from some of the reports of the Agricultural Missions that came from Portugal to Goa. Their primary concern was with methods of increasing agricultural production, deciding on appropriate agricultural crops, soil mapping, fertiliser composition, etc. See for example H. Lains e Silva (1961) *Relatorio da Actividade da Missao de Estudos Agronomicos do Ultramar de 17 de Junho ate 31 de Dezembro de 1960*, Lisboa and J. Sacadura Garcia (1961) "Communicacoes" *Missao de estudos agronomicos do Ultramar*, Lisboa; Hernani Cidade Mourao (1961) *Missao de estudos Agronomicos do Ultramar – "Outline of the Rice Varieties Experiments to be carried out in India,"* Lisboa.

However, it is only the Agricultural Tenancy Rules (1975) that made it mandatory to form Tenants Associations by all tenants cultivating in the vicinity of bund (embankment) and who have benefited jointly from the bund. Anticipating that the tenants may not have sufficient finances to undertake large public works, the government promised to re-imburse the expenses undertaken by the Tenants Association to maintain the embankments (Section 35 of the Tenancy Act. 1964 and Section 12A Tenancy Rules 1965). In a review of the functioning of the Tenants Association, the ALDP report (GoG(1992) found that the number of Tenants Associations created were 138 (GoG 1992: 36) and 87% of these Associations were in the five talukas of Pernem, Bardez, Bicholim, Ponda and Tiswadi. These five talukas also accounted for a similar fraction of *bunds* with sluice gates, 91% of the land and 92% of the membership of the Associations. However, by 1992 most of these tenants associations had become financially bankrupt (GoG 1992: 43).⁹

The current situation is that the tenants do not even undertake minor repairs and leave it to the state machinery to execute these tasks (GoG 2000). The process involved in activating the state system is cumbersome and lacks local participation. It is evident that there has been wide-spread free riding on the part of tenants in the new regime which is why the Tenants Associations did not sustain collective action. In fact, it would be rational for them to anticipate that the state would intervene if there was a decline in embankment maintenance for the very reasons that led to redistributive measures in the first place.

This expectation, however, has not been entirely realized as the incentives for the state to undertake soil conservation may have been different from those of the tenants. As discussed above even though there was an increase in current expenditures for soil conservation, in real terms there has been a substantial decline. With reduced local participation and a decline in real expenditures, it is but to be expected that embankment maintenance would decline.

3.3 Impact of Transition

The above discussion indicates that an endogenous self-sustaining institution (the *comunidade*) which owned and maintained the village cultivable lands and was responsible for the administration was replaced in the post-1961 situation by two local level bodies – the *panchayats* and the Tenants' Association. The *panchayats* neither have the mandate, the incentive nor the financial strength to maintain such large agrarian public works. The Tenants' Association, which was given the responsibility for land maintenance and was supposed to bring together the beneficiary tenants failed to sustain itself as an institution.

⁹ The main sources of income of the Tenants' Associations were membership fees (fixed at Rs 10 for enrolment and an annual membership fee of Rs 10), earnings from fishing leases of the sluice gate and trees (Tenancy Rules 1975, Section 7 (2 & 3)).

The Tenancy Act began the process of creating private rights of tenants on *comunidade* (or *gaunkari*) lands to ensure distributive justice to individual tenants. But it left open the question of ecological sustainability. There is a fair amount of reported evidence indicating decline in embankment maintenance (Alvares 2002:100-104). In 1999, the embankments in parts of Divar island gave way which led to setting up of the Multi-Disciplinary Committee (de Souza undated, GoG 2000). Smaller breaches have been reported on a regular basis (GoG 1992, TERI 2000:125).

4. Field Survey: A Note

In order to understand the current state of the agrarian economy in Goa, 360 households from four villages were interviewed in the year 2002-2003. Of the two districts which constitute the administrative division of Goa, three villages were chosen from North Goa (Goltim, Malar and Calangute) and one from South Goa (Curtorim). The villages of Goltim and Malar are located on two sides of Diwar, an island on the Mandovi estuary and have one of the oldest and most intricately laid system of embankments and are rural agricultural systems. Calangute is a village in Bardez taluka which has seen rapid urbanization impacts and has the highest visitations of tourists in Goa. It is a coastal village on the Arabian sea which still retains a fair amount of agricultural land and activity. Curtorim on the other hand is a village on the Zuari river and is regarded as one of the villages with highly fertile soils and is primarily agricultural as far as economic activity is concerned. These villages were selected to represent different agro-economic zones. The island villages were representative of an economy still largely dependent on agricultural or economic incomes being generated outside the village. Calangute has a fair degree of tourism services therefore incomes in the village are diversified and offers exit options. Curtorim on the other hand is a river front village but also has direct road links with the rest of the state. The village selection was done on the basis of peer group discussion on coastal villages and villages were chosen for their particular characteristics which could be representative of similarly placed coastal villages of the state. In each village 90 households were randomly selected from three categories of agents – *Gaunkars* (the male descendents of original village settlers), the tenants who rented *comunidade* lands on auction and the *Mundkars* who were employed on private agricultural lands.¹⁰

The survey was meant to provide information on: (a) The current land holding structure to address the equity and re-distribution question, (b) the extent of fallow lands due to salinity which relates to sustainability and conservation, and (c) the exit of agents from the agrarian economy.

¹⁰ According to the Royal Decree of 1901 (24th August) the *mundkar* is defined as “an individual residing in a dwelling settled in another’s rural property mainly with the aim of cultivating or for looking after the property” (quoted in GoG 1967a: 283) The *Munddcarato* system prevailed largely as a verbal agreement between the landlord and *mundkars* and sometimes as unwritten conventions followed over generations. Properly drawn up contracts were rare (GoG 1967a:282).

Secondary data on fallows due to salinity was not available to us either for the current period or the pre-1964 period. However, during the field interviews, the interviewees felt that maintenance of the embankments and therefore the protection of the *khazan* lands under the *comunidades* was more effective than under the current institutional arrangement. This is also borne out by the field results which seem to report losses of agricultural area in the post-tenancy reform period. We are aware that salinity ingress has been a concern even for the state administration since it appointed a Multi-Disciplinary Committee in 1999-2000 to study and find a solution the protection of embankments (GoG 2000). Almost a decade earlier Agricultural Land Development Panel looked at the functioning of the new institutions (Tenants Associations) (GoG 1992).

4.1 Heterogeneity in Land Ownership

Some basic findings that would be of interest in the current paper are the changes in land holding pattern, extent of damage due to non-maintenance of public works in contemporary Goa and the exit of agents from the agrarian system. We begin by briefly discussing the current land holding structure.

Table 3: Average Land Holding by Category in Hectares (Survey Results 2002-03)

Category	Average Private Area	Average Comunidade Area	Average Total Area
Gaunkars	0.2788	0.2089	0.4877
Tenants	0.1111	0.5180	0.6291
Mundkars	0.0407	0.2513	0.2920

To understand changes in heterogeneity we must have a comparative baseline figure. However, there is no secondary data available for land holding pattern especially for private lands by socio-economic category of owners. We could, however, from our survey findings attempt to reconstruct the pre-tenancy land ownership scenario. We assume that all private lands were under the ownership of the *gaunkars* and that they continue to hold their private lands within the group. On the other hand, lands claimed by the tenants and *mundkars* were earlier *comunidade* lands.

In our survey we find that the *gaunkars* claimed to own an average of 0.2788 hectares (ha.) of private lands and a total of 0.4877 ha. This implies by our assumption above that tenants and *mundkars* did not own any private lands in the pre-tenancy period and the *gaunkars* alone had private lands of 0.2788 ha. each. The tenants during the survey claimed to own an average of 0.6291 ha. (of which only 0.1111 ha. is private or non-*comunidade* land). The *mundkars* claimed 0.2920 ha. (of which 0.0407 ha. is private land and 0.2513 ha. is *comunidade* land) (Table 3)¹¹.

So while the *comunidades* lost their control over its common lands, the tenants on average gained 0.6291 ha. and *mundkars* gained 0.2920 ha. The post- tenancy

¹¹ This is a possibility of the different categories of respondents over-stating or understanding claims over land ownership for various reasons.

legislation scenario therefore is more equitable than the pre-tenancy situation.

4.2 Land Holding Size – Prior to Tenancy Reform

In the 11 talukas of Goa, prior to the tenancy legislation, there were 31,259 plots under the comunidades' control and 30,551 tenants cultivated these fields before the tenancy act came into force (GoG (1967b) 18-19)) (Table 5). Among these plots the maximum number 17,719 (over 56%) were of the size 0.4 ha. or more, which is the highest plot category.

Table 4: Taluka-wise Distribution of *Comunidade* Plots (in Hectares) (Prior to Tenancy Refoms)¹²

S. No	Talukas	0-.999	0.1-0.1999	0.2-0.2999	0.3-0.3999	0.4-above	Total plots (lotes)	Number of Tenants in 1963	Resident Gaunkars & Shareholders	Total No. of registered Gaunkars & Shareholders
1	Tiswadi	207	257	541	758	5057	6820	6025	3457	8870
2	Salcete	206	217	769	1998	7112	10302	11017	4956	12473
3	Bardez	314	890	2729	2478	3459	9870	9494	14128	25003
4	Mormugao	21	44	185	281	791	1322	1601	790	2090
5	Ponda	93	194	315	349	767	1718	1350	1357	2321
6	Bicholim	19	83	136	145	417	800	641	1022	1290
7	Pernem	--						41	0	0
8	Quepem	6	6	6	3	63	84	165	85	107
9	Sanguem	230					230	146	80	106
10	Canacona	16	11	18	12	52	109	67	63	133
11	Satari	1	1	1	1	1	4	4	29	38
	Total	1113	1703	4700	6025	17719	31259	30551	25967	52431

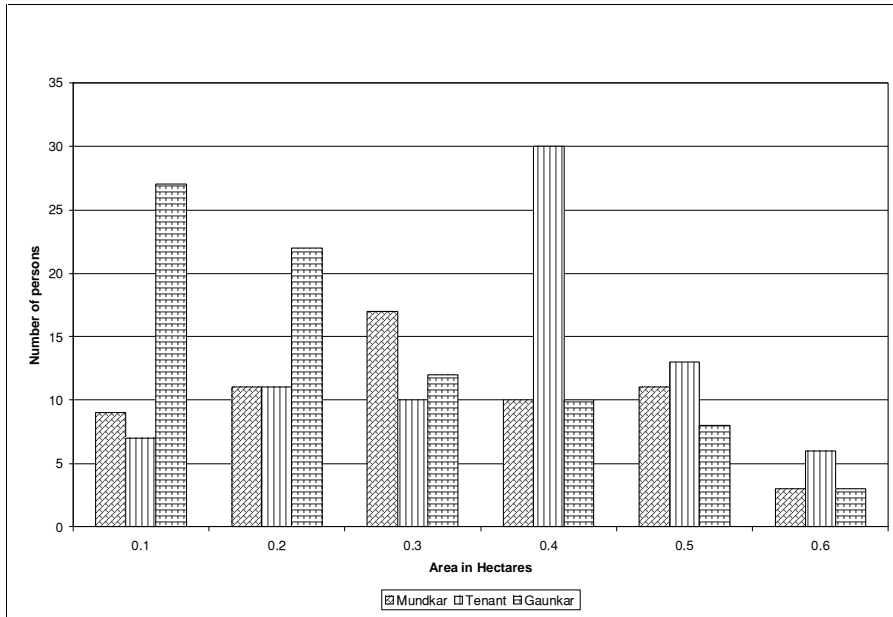
Source: GoG (1967b) Annexure No:6, page 18 & 19

In our primary survey we found that the highest frequency of ownership was in the category 0.4-0.5 Ha. which is similar to the frequency of plot size prior to land reform (Table 3 & Graph 3).

We examine next the issue of migration as the survey data indicates that there has been significant out-migration from Goa. A total of 77 households reported as having at least one member abroad, and 53 were from the category of *gaunkars*. An employment opportunity outside the system is described as an exit option. In an agrarian economy this could be off farm employment, or in the extreme case a physical departure or displacement from the agrarian region implying migration.

¹² Pernem is a peculiar case because all the comunidades of Pernem forfeited their lands and there is no inscription of gaunkars in this taluka. During the Portuguese colonial rule, Pernem was territory bordering the Maratha lands and the charge of the entire land area in this taluka was given to the Ranés to protect thereby disenfranchising the comunidades

Graph 3: Land Ownership Distribution



4.3 Exit Options and the Commons

The impact of exit options on commons in the presence of heterogeneity is a complex phenomenon and is said to depend on the relationship between wealth inequality and exit options. Two possibilities are cited (a) when exit has a ‘concave’ relationship with wealth inequality — the value of outside option rises with wealth but at a decreasing rate as wealth rises. In this case conservation would decrease with increase in inequality, and (b) when it has a convex relationship with wealth — the value of outside option rises with wealth at an increasing rate. In this case, increase in inequality has an ambiguous effect (Dayton-Johnson & Bardhan 2002). Numerous case studies are available wherein the rich as well as poor are seen to exercise the exit option so it is inconclusive to argue whether it is the rich who break the cooperation or it is the poor (Baland & Platteau 1999).

We find evidence that securitization of tenure and the option to buy out land by the tenants on the one hand created greater homogeneity, but on the other hand might have been responsible for the exit of the disenfranchised *gaunkars* from the agrarian system.¹³ The change in Tenancy Laws caused loss of control of the *comunidade* lands and possibly increased the search for exit options.¹⁴

¹³ Tourism was another exit option that opened up in a big way in the early 80s (Mukhopadhyay & Desouza 1997).

¹⁴ It is pertinent here to mention that out-migration is not new to Goa. For over two centuries there has been a significant Diaspora of Goans living in different parts of Africa (Portuguese and non-Portuguese colonies at that time) (de Souza 1994). What makes this phase of migration significantly different is its impact on the local economy because of development of international financial markets which permit easy transfer of remittances from abroad even to remote villages. This has had deep impacts on the local economy which was not the case in the earlier phase.

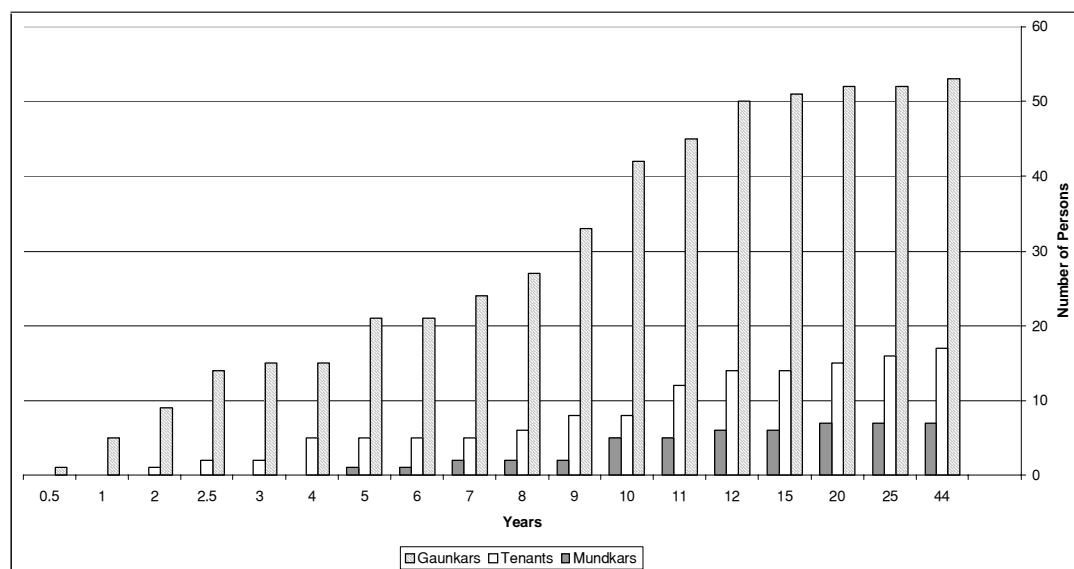
The frequency of exit by the three categories in the surveyed villages is shown in Table 5 and Graph 4. The first migration of this generation in these villages is reported in 1958 from among the *Gaunkars*. The migration from among the *Gaunkars* has been consistently higher than that of the other two categories.

Table 5: Persons with Family Abroad and Receiving Foreign Remittances (Current Survey Data)

Category (90 persons interviewed in each category)	Households with family Abroad	Probability of having a family member abroad	Households Receiving Foreign Income	Proportion of members abroad and remitting money
Gaunkar	53	0.44	25	0.47
Tenant	17	0.14	9	0.52
Mundkar	7	0.05	6	0.86
Total	77	0.213	40	0.52

The subsequent migration by tenants and mundkars can be attributed to two factors: (a) the declining productivity of land, and (b) old social networks wherein the early migrants (*gaunkars*) passed on information about job opportunities abroad. In the post-Tenancy Act period there is a six-year gap between the first *gaunkar* migrants and the subsequent tenant migrant.

Graph 4: Cumulative Migration Abroad Year 1958-2001



4.4 Determinants of Exit

In order to test for determinants of exit (here interpreted as immigration abroad) we used the decline in land productivity due to salinity ingress as a determining factor. The length of the fallow period (in years) is used as a proxy for decline in land productivity. We also wanted to test if any particular category (*gaunkars*, tenants or mundkars) exhibited differential behavior.

A Logit model is setup with a dependent dummy variable indicating whether the household has a member abroad or not (Frn_D=1 for yes, and =0 for no). This was assumed to be a function of:

- (a) Category to which an agent belonged – we use the mundkars as the reference category and dummies for *Gaunkars* (Gaunk) and Tenants (Tenant), as independent variables to test which of these categories showed greater inclination to exit (Gaunk= 1 if *gaunkar*, Gaunk = 0 if non-*gaunkar*, similarly Tenant =1 if tenant, Tenant =0, otherwise). Expected sign of coefficient for Gaunkar is positive (as *Gaunkars* being disenfranchised by the land distribution system are expected to have a higher propensity to exit).
- (b) The expected sign of coefficient for tenants is uncertain. As beneficiaries of tenancy legislation they should have little incentive to exit, but on the other hand, with increased fallow, search for other income would have a positive impact on exit. However, we include a variable (discussed below) for the number of years land lay fallow and therefore the negative impact should not show up.
- (c) The number of years land lies fallow (Fal_Yrs) should increase the propensity to search for exit options. Expected sign of coefficient is positive.
- (d) We also tested to see if “Other Incomes” (Other_Y — Non-Agricultural incomes excluding foreign remittances) have any impact on the exit of persons from the agrarian system. Expected sign of coefficient is uncertain. It is possible that the less privileged would have a higher propensity to exit. But it may also be anticipated that the opportunities for exit may be much higher for the better endowed.
- (e) Finally we also wanted to check if the size of the family (adults) was influencing the desire to exit as a push factor in migration. Expected sign of coefficient is positive.

Table 6: Description of Variables and Expected Signs

Variable	Expected Sign	Description
Gaunk	+	Gaunkar Dummy (If Gaunkar=1, Otherwise =0)
Tenant	?	Tenant Dummy (If Tenant =1, Otherwise =0)
Fal_Yrs	+	Number of Years land is fallow
Other_Y	?	Non-agricultural incomes (Per Month) Categories: less than Rs. 500 = 0; Rs. 501-1000 = 1; Rs. 1001-2500 = 2; Rs. 2501-5000 = 4; Rs. 5001-above = 5.
FSA	+	Family Size (Adults)

Table 7 below provides the summary statistics of the independent variables in the Logit function.

Table 7: Summary Statistics

	Gaunk (Dummy)	Tenant (Dummy)	FAL_YRS	Other_Y	FSA
N of cases	360	360	360	360	360
Minimum	0.000	0.000	0.000	0.000	1.000
Maximum	1.000	1.000	25.000	4.000	14.000
Range	1.000	1.000	25.000	4.000	13.000
Sum	120.000	120.000	754.000	256.000	1549.000
Mean	0.333	0.333	2.094	0.711	4.303
Standard Dev	0.472	0.472	4.889	1.253	1.906
Variance	0.223	0.223	23.902	1.571	3.632

The logit function tested for is:

$$\text{Frn}_D = f(\text{Fal}_Y, \text{Gaunk}, \text{Tenant}, \text{Other}_Y, \text{FSA})$$

The results of the regression are reproduced below (Table 8).

Table 8: Summary Regression Results

Dependent Variable: Frn_D

Number of Observations: 360.

	Coefficient	Standard Error	t-ratio	p-values	Odds Ratio	Slope (at Mean)
Constant	-4.192	0.647	-6.481	0.000		
Gaunk	1.668***	0.491	3.397	0.001	5.304	0.1372
Tenant	0.343	0.552	0.662	0.534	1.409	0.0282
Fal_Yrs	0.070**	0.031	2.273	0.023	1.072	0.0057
Other_Y	0.883***	0.122	7.208	0.000	2.418	0.0726
FSA	0.102	0.094	0.102	0.278	1.107	0.0084

** and *** in the coefficient column represent 95% and 99% level of significance respectively.

Log likelihood: -107.643

Log Likelihood of constants only model = LL(0) = -158.943

2*[LL(N)-LL(0)] = 102.600 with 5 df Chi-sq p-value = 0.000

McFadden's Rho-Squared = 0.323

Among the variables presented in Table 8 above, the coefficients of family size (adults) and the category tenants (Tenants) are not significant even at the 90% level. The number of years for which land lies fallow is significant at the 95% level. The category of *gaunkars* and Other Incomes have coefficients which are significant at the 99% level. This confirms the expectation that an agent is more likely to exit if his/her land is fallow and are more likely to exit if the household belongs to the *gaunkars* category. The Likelihood Ratio (LR test) result indicates that the model is significantly different from the “constants only” model and the McFadden's Rho-Squared suggests reasonably acceptable fit. The last column of Table 8 provides the slope at mean which measures the Marginal Effect that each variable has on the dependent variable (in a Logit function). Expectedly ‘Gaunk’ has the highest slope.

We next turn our attention to the current status of public works which has direct implications on sustainability of agrarian lands. The embankments which are public goods in nature need to be maintained in order to prevent salinity ingress.

4.5 Impact of Public Works Decline

The reported impact of salinity ingress is presented below. Seventy three households reported having fallow lands due to salinity ingress. This probably added to the incentive to exit the agricultural sector even by the tenants who were beneficiaries of the tenancy reform. Of the three categories, it is noteworthy that it is the tenants who have reported larger fallow lands in terms of total area (Graph 5). The growth in numbers reporting fallow is shown below as a cumulative frequency graph.

Graph 5: Cumulative Number of Persons reporting Fallow Area Year 1977-2001

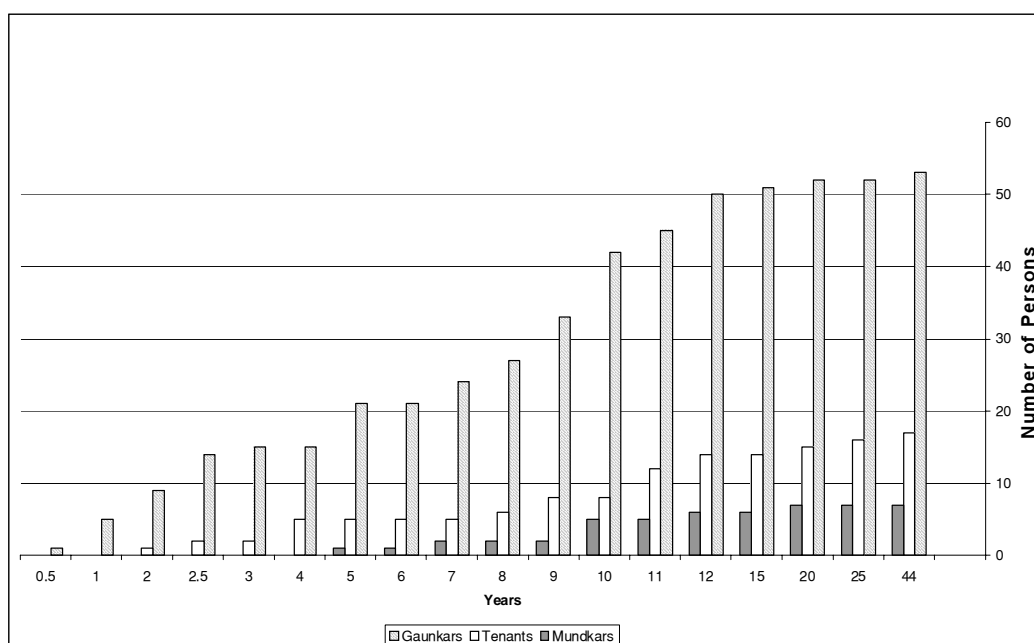


Table 9: Persons with Fallow Lands and having Family Abroad (Current Survey Data)

Category (120 persons interviewed in each category)	Persons with Fallow Area	Proportion of Person owning Fallow Area in each category	Number of Persons Abroad among those with fallow land	Proportion of foreign residents among fallow land holders
Gaunkars	21	0.17	8	0.38
Tenants	30	0.26	5	0.16
Mundkars	22	0.18	3	0.13
Total	73	0.21	16	0.21

The gaunkars showed the highest frequency of exit from among those families that reported fallow lands the (conditional) probability of exit (migration) by each category — *gaunkars* 38%, tenants 16% and *mundkars* 13% (see Table 9). The *mundkars* however reported the highest proportion of fallow lands while gaunkar’s reported the lowest proportion of fallow lands (Table 10).

Table 10: Distribution of Fallow Land among Different Categories (Current Survey Results 2002-03)

Category	Persons with Fallow Area	Total of Land Area Owned(ha.)	Amount of Land Affected (ha.)	Proportion of land in entire category
Gaunkars	21	58.524	5.7	9.7
Tenants	30	75.49	15.3	20.2
Mundkars	22	35.04	7.99	22.8
Total	73	169.054	28.99	17.1

5. Discussions

The above results provide interesting pointers. *Comunidades* lost their monopoly over agricultural land management in the wake of post-Independence Tenancy legislation and this led to the decline of the traditional institution and reduced maintenance of public works as there was no financial support for the *comunidades*. This appears to have led to two things: (a) Increased salinity ingress (b) Exit of *Gaunkars* from the agrarian economy.

The major gainers in the land redistribution, the tenants and *mundkars*, showed willingness to pay for adoption of individual increases in production by investing in mechanization (Mukhopadhyay 2005a). However, there is incidence of increasing fallows which is a direct outcome of reduced local public expenditures to undertake productivity sustenance activities. This is typical myopic behavior and indicative of institutional failure. Some of these outcomes have been anticipated in the evolutionary game theory literature which suggests that in the absence of punishment, cooperation would breakdown (Sethi & Somanathan 2004). This punishment must be cheap and feasible otherwise agents may refrain from punishing thereby leading to breakdown in cooperation. In Goa, when the *comunidades* had the right to auction their lands prior to tenancy legislation, non-cooperation led to eviction and cancellation of tenures. So punishment was both feasible and inexpensive for the institution.

This brings us back to the issues of property rights regimes, redistribution, and ecological sustainability. In the literature, it is commonly argued that security of tenure is a pre-condition for agents to undertake conservation measures (Holden & Shiferaw 2002). So expectedly, the security of tenure should have induced better conservation in Goa. Our finding is in contrast to this. In the new regime homogeneity and security of tenure increased but cooperation to maintain embankments did not.

The critical question is why did cooperation not emerge? A number of possibilities exist. Clear punishment rules (and the willingness to impose them) which are ensuring cooperation is missing in the post-tenancy institutional arrangement. If the beneficiary agents did not cooperate, there was very little chance of any punishment (eviction) in the post-tenancy period. Secondly, there was a withdrawal of the previous managers of the agrarian system (*gaunkars*) from the village affairs as they had a reduced role in

the new scenario.¹⁵ But all of these possibilities point to one certainty — that replacement of an organic local institution with an inorganic one can at best have unanticipated (or worse undesirable) consequences.

So what are the lessons to be drawn here? In the euphoria of asset distribution, factors of institutional incentives were not examined, as cooperation was expected to automatically emerge among beneficiary farmers. We find that this did not occur. Without a prior history of cooperation (supply of public goods – embankments), the tenants failed to create new self-sustaining institutions even though there were state incentives to do so.

The other question that this leaves us with is the desirability of homogeneity in the commons. The literature in this area suggests that there could be a threshold-effect with regard to heterogeneity and cooperation (Dayton-Johnson and Bardhan 2002).¹⁶ In the current context, is the reduced state of cooperation indicative of a level of homogeneity beyond this threshold? This would need further investigation.¹⁷

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¹⁵ It is possible to blame the usual culprit of an inefficient credit market which did not permit the tenants from making the financial commitments necessary to maintain public works and simultaneously undertake private investments. Except in this case as we have discussed above, the government offered to reimburse (upto a ceiling of 50%) the expenses incurred on embankment maintenance. So the state of the credit market may be discounted.

¹⁶ It has been suggested that there could be an inverted U relationship between heterogeneity and cooperation. This implies that initially cooperation increases as the degree of homogeneity increases but decreased after a certain point which is indicative of threshold effect.

¹⁷ However, if there are non-convexities, which are not unlikely, alternative policy solutions could emerge. Non-convexity in such a situation would imply that there could be multiple thresholds in the homogeneity-cooperation relationship. So while there would seem to be a reduction in cooperation at this level of homogeneity, a further increase in homogeneity instead of further reducing cooperation may increase it beyond a certain point. Alternatively, if the other turning points are relatively lower as far as cooperation levels are concerned, then a further increase in homogeneity even in the presence of non-convexities would not lead to greater cooperation.

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Appendix 1

Table 11: Taluka-wise Total Income, Expenditures and Balances of Comunidades
(In Rupees for the period 1954-1963)

Talukas	Total Income									
	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963
1	2	3	4	5	6	7	8	9	10	11
Goa(Tiswadi)	1940673	1840549	1541616	1610773	1449316	1213370	1748734	1488528	1131975	1106023
Salcete	1880449	1905106	1685374	1804307	1798689	1683383	1682072	1689024	1338928	1332017
Bardez	1567738	1576528	1436776	1397237	1380224	1341962	1393936	1367613	1183629	1156186
Mormugao	212757	206906	196523	201754	199774	199635	209211	215554	177571	172404
Ponda	450103	450071	410804	391446	354102	337082	354092	344734	306380	286198
Bicholim	173642	209157	137415	158412	128400	132248	145817	199809	124828	140210
Pernem	3774	9656	7905	6323	9906	6674	7165	6957	5032	4858
Quepem	28710	28473	26087	30544	31604	32776	28182	32140	28096	27200
Sanguem	21859	19915	20134	20748	21504	21654	21844	22273	22086	18582
Canacona	21469	19923	14495	15398	14703	14967	14564	15158	24224	17756
Satari	2182	2077	1902	1880	2036	2030	1841	2452	1536	2203
Total	6303356	6268361	5479031	5638822	5390258	4985781	5607458	5384242	4344285	4263637
	Total Expenditure									
Goa(Tiswadi)	989382	939454	926487	952380	866668	1062103	1348830	1274212	1009164	1046470
Salcete	762267	844704	738343	820405	870103	769655	934203	965108	892750	941670
Bardez	871676	944606	803095	866308	917372	954128	1032872	1053122	1049748	1053174
Mormugao	161084	114773	112912	107781	108317	117064	136843	150778	151396	145027
Ponda	215348	213216	212953	184163	206217	217014	296930	266356	247818	225603
Bicholim	103474	147168	93039	103407	102512	100817	120111	155666	102279	125525
Pernem	4614	6378	6216	4290	4648	3725	6802	3949	7035	5381
Quepem	25893	29607	29243	29135	30225	31096	30903	29073	26022	25876
Sanguem	23223	22654	20352	20748	21904	23382	23186	26062	19597	20183
Canacona	18915	13463	12344	12328	13056	13940	13876	14010	24224	16631
Satari	1746	1610	1816	1865	1817	1808	1719	2113	1371	1991
Total	3177622	3277633	2956800	3102810	3142839	3294732	3946275	3940449	3531404	3607531
	Balance									
Goa(Tiswadi)	951291	901095	615129	658393	582648	151267	399904	214316	122811	59553
Salcete	1118182	1060402	947031	983902	928586	913728	747869	723916	446178	390347
Bardez	696062	631922	633681	530929	462852	387834	361064	314491	133881	103012
Mormugao	51673	92133	83611	93973	91457	82571	72368	64776	26175	27377
Ponda	234755	236855	197851	207283	147885	120068	57162	78378	58562	60595
Bicholim	70168	61989	44376	55005	25888	31431	25706	44143	22549	14685
Pernem	-840	3278	1689	2033	5258	2949	363	3008	-2003	-523
Quepem	2817	-1134	-3156	1409	1379	1680	-2721	3067	2074	1324
Sanguem	-1364	-2739	-218	0	-400	-1728	-1342	-3789	2489	-1601
Canacona	2554	6460	2151	3070	1647	1027	688	1148	0	1125
Satari	436	467	86	15	219	222	122	339	165	212
Total	3125,734	2990,728	2522,231	2536,012	2247,419	1691,049	1661,183	1443,793	812,881	656,106

Source: GoG (1967b) Annexure no : 8, page 22- 23