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The Condition of Sustainable Development
A Realist Explanation of the Causes of Unsustainable Development in the Sugar Industries of Barbados and Australia

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Abbreviations and Acronyms

ABARE	Australian Bureau of Agricultural Resource Economics
ACP	African, Caribbean and Pacific
BADC	Barbados Agricultural Development Corporation
BAMC	Barbados Agricultural Management Company
BCSA	British Commonwealth Sugar Agreement
BET	Basic Export Tonnage
BLP	Barbados Labour Party
BNB	Barbados National Bank
BSES	Bureau of Sugar Experiment Stations
BSIL	Barbados Sugar Industry Limited
BS&T	Barbados Shipping and Trading Company
BWU	Barbados Workers Union
CLICO	Caribbean Life Insurance Company
CSA	Commonwealth Sugar Agreement
DLP	Democratic Labour Party
DPI	Department of Primary Industries
ECU	European Currency Unit
EEC	European Economic Community
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
GOB	Government of Barbados
HFCS	High Fructose Corn Syrup
HIP	Heavily Indebted Plantation
IMF	International Monetary Fund
ISA	International Sugar Agreement
ISO	International Sugar Organisation
IUCN	International Union for the Conservation of Nature
MIP	Moderately Indebted Plantation
RAS	Rural Adjustment Scheme
SCI	Sparks Companies Incorporated
SCIST	Senate Committee on Industry Science and Technology
tc	tonnes of cane
ts	tonnes of sugar
ts/y	tonnes of sugar per year
UNEP	United Nations Environment Programme
WCED	World Commission on Environment and Development
WWF	World Wide Fund for Nature

INTRODUCTION

This thesis is concerned with the idea of sustainable development. It is concerned to understand how the theory and practice of sustainable development might be progressed. The central tenet of the thesis is that unsustainable practices and events are most usefully understood as outcomes which are conditioned by underlying social structures and processes. In itself, this is hardly an original or profound assertion. However, what is attempted here is a multi-layered explanation of unsustainability which objectifies and elucidates the significance of different elements of causation and thus one which may suggest new and potentially useful ways of achieving sustainable development in practice. It is argued that a realist understanding of causality informed by insights from regulation theory is particularly relevant to this agenda. From a realist perspective, unsustainable practices and events are understood as reflecting not just tendentially expressed real causal mechanisms and contingent factors, but also the conditions which activate the mechanisms involved. In practice, these conditions are largely defined by what regulationists term the 'mode of social regulation'. Thus it is suggested that regulation designed to promote sustainable development needs to be just as concerned with the nature of 'modes of social regulation' in general as it is with specific, concrete controls on development.

The first three chapters of the thesis outline and review current thinking on sustainable development, realism and regulation theory respectively. The theoretical constructs developed in these early chapters are subsequently tested, refined and evaluated in their application to case studies of cane sugar production in Barbados and Australia. Chapter 4 outlines and justifies the methodology adopted in the research. Chapter 5 provides a general description of cane sugar production and consumption and the global sugar economy. This provides a context for the subsequent analysis of the two case studies. Chapters 6 and 8 begin with some background information on Barbados and Queensland respectively, and then continue by outlining the current situation of the sugar industries in these two locations. These two basically descriptive chapters are each followed by further chapters which analyse and interpret the dynamic and often unsustainable patterns of development which have occurred in these two locations. The analysis here attempts to develop the type of multi-level, realist, analysis articulated in earlier chapters. Instances of unsustainability are interpreted as the outcomes of plural, but co-active elements of causation. Specific attention is focused on how the inherent

unsustainability of extant accumulation systems and social structures is apparently translated into more significant forms of unsustainability, and within this, on the ways in which current modes of social regulation appear to legitimate and license this process of translation. Chapter 10 then attempts to synthesise the analysis of the case studies and to identify any generally relevant insights into the nature of sustainable development. The final section of the thesis, presents an evaluation of this project and the conclusions reached, and suggests how this approach and methodology defned in this research might be further tested, refined and progressed.

Chapter 1. SUSTAINABLE DEVELOPMENT

This chapter outlines some key debates within the very large volume of literature which has emerged around the idea of sustainable development. A critique of existing approaches to the concept is used to define the nature of a research agenda which may allow thinking and practice in this area to be progressed. It is argued that one way forward lies in the development of a multi-level but unified explanation of the causality of unsustainable events and practices. Specifically, it is suggested that a critical realist approach, allied to insights from regulation theory, can provide a deeper and potentially useful understanding of how and why unsustainable events tend to be the norm.

1.1 A good idea?

Seemingly simple, intuitively rational and self-evidently expedient, sustainable development is a notion which engenders an instant and almost instinctive attraction. As Redclift (1992:1) suggests, "like motherhood and God it is difficult not to approve of it". Since it first achieved popular recognition following the World Commission on the Environment and Development (WCED) report in 1987, sustainable development has rapidly become "the watchword for international aid agencies, the jargon of learned planners, the theme of conferences and learned papers, and the slogan of environmental and developmental activists" (Lélé, 1991:607).

To some extent the increasingly widespread use of notions of sustainable development may well reflect the inherent rationalism of the idea. Certainly, images of the unsustainable conjure up affective visions of Malthusian crisis and catastrophe. Adams (1993:218), however, outlines a more widely accepted explanation of its current prevalence, "sustainable development is a flag of convenience under which many ships sail, and it is this catholic scope that goes a long way to explain its power and popularity in debates about development". Within this however, two particular factors appear to underpin its appeal. First, the lack of any single universally accepted and applicable definition means that the idea can be interpreted in a wide range of different ways. As Redclift (1992:1) puts it, "sustainable development has gained currency precisely because of the way it can be used to support various agendas". Second, the intuitive and immediate appeal of the idea makes it an effective means of legitimating a whole range of diverse agendas and policies.

In practice, sustainable development has become an increasingly common element of the rhetoric of those wishing to legitimate policy. It has become so embedded in the vocabulary of politicians and planners that it has apparently ensured itself of a permanency which arguably far surpasses its usefulness. Certainly, the real practical utility of the idea is increasingly being seen as questionable. Sustainable development is now widely considered to be a clichéd platitude with little genuine utility - an insubstantial and faintly embarrassing testament to utopianism and political convenience. However, behind the political expediency and academic confutation there remains an urgent and fundamental concern for the actuality of moral and material dysfunction and crisis. The concept of sustainable development is possessed of a simple but inalienable legitimacy which is not diminished merely because the idea is proving exceedingly difficult to operationalise. Understanding how sustainable development might be more fully understood and hence how it might be more effectively promoted remains a concern of paramount importance.

1.2 **What is sustainable development?**

The most widely known and used definition of sustainable development is that provided by the W.C.E.D. (1987:8) which suggests that sustainable development is "development which meets the needs of the present without compromising the ability of future generations to meet their own needs". In practice, however, this definition says very little about what sustainable development actually is or how it might be achieved. As Brookfield (1991:46) points out this is more of a statement of intent than a workable definition. In the years since 1987, considerable effort has been expended in attempting to define the idea of sustainable development more explicitly. To date, no universally acceptable and useful definition has been achieved. A factor which has led writers such as Dovers & Handmer (1992:264), for example, to conclude that, "as currently defined, it is so broad and generally applicable that its inherent vagueness renders it inoperative". From a similarly sceptical position Manning (1992:300) made what may well prove to be a highly perceptive analogy, "sustainable development is a broad and possibly undefinable goal - like social justice".

In practice, the inherent ambiguity of the idea is often exacerbated by the fact that a range of terms such as 'sustainable development', 'sustainability',

'environmental sustainability', 'sustainable growth', etc. are used more or less interchangeably when in point of fact they have specific and very different connotations. As English Nature point out:

> "It is important to distinguish between 'sustainable development' and 'sustainability'. Sustainable development is a broader social objective: it is concerned not just with environmental protection but with the achievement of other social objectives .... This is not the case, however, for 'sustainability'. This is concerned only with the environment, and it can be defined quite precisely (It is true that sometimes the adjective 'sustainable' refers to social and political sustainability as well as to environmental - some authors have argued that the stability and durability of social institutions as much as the environment are necessary to a 'sustainable society'. But 'sustainability' has come to be almost exclusively an environmental term)". Thus 'sustainability', in a narrow sense, is related to the resilience of ecosystems, that is their ability to withstand various types of stress, rather than any social or economic considerations" (English Nature, 1992:17).

Pierce begins to outline some of the implications of these differences in interpretation and emphasis:

> "Among the numerous definitions of sustainability, it is possible to identify two relatively independent and distinct perspectives - a narrow concept preoccupied with the sustained use or utilisation of the resource base (International Union for Conservation of Nature 1980; Tisdell 1984) and a broader concept concerned with sustainable development in all of its manifestations (Brown *et al.*, 1987; Redclift, 1987; Liverman *et al.*, 1988; Barbier, 1989)" (Pierce, 1992:310).

Whilst recognising that a broad spectrum exists between these two polarisations, Hodge and Dunn (1992:16) have summarised the essential characteristics of what they term the 'hard' and 'deep' positions (see figure 1.1.). In a similar manner, English Nature define 'strong' and weak' standpoints on sustainable development which they contend suggest strategies for the operationalisation of the concept:

> "A weak use requires that environmental considerations are taken into account in policy making (and it is generally assumed, given more weight than hitherto), but allows such considerations to be traded off against other goals to generate the socially optimal or desirable result .... a strong use, in which environmental considerations act as a constraint on the achievement of other goals, development to meet other social goals is allowed but subject to certain prior environmental conditions being met. These conditions are often known as sustainability constraints or limits" English Nature (1992:16).

Whilst English Nature (1992:16) argue that "it is not impossible to reconcile these two positions: sustainability constraints can be applied to some aspects

of the environment while others are traded off in terms of costs and benefits", it is far from clear whether this is indeed the case. As Ryle (1988:19) points out, "green politics cannot adopt a purely ecological approach, relations between people and classes are at stake the moment one begins to talk about

Figure 1.1 **Alternative positions on sustainable development**

Hard Sustainability	Deep Sustainability
Prevention of catastrophy for human society	Promotion of society in harmony with ecosystem
Acceptance of science and modern technology	Questions science; seeks alternative technology
Anthroprocentric	Ecocentric
Intergenerational distribution treated separately	Intergenerational distribution integral to sustainability
Lower environmental risk aversion	High environmental risk aversion
Marginal changes to existing systems and institutions required	Shift to new systems and institutions

Source: Hodge & Dunn (1992)

structural economic and social change, even if change is originally advocated because of ecological desires and fears". Likewise Redclift (1992:21) suggests, "it soon becomes clear that we cannot achieve more ecologically sustainable development without ensuring that it is also socially sustainable. We need to recognise in fact, that our definition of what is ecologically sustainable answers to human purposes and needs as well as ecological parameters". A similar point is made by Palmer (1990:185) who points out, "the necessary fundamental changes .... cannot stand alone. Alongside these changes must be a corresponding shift in attitudes and values - in the social, economic, political and moral aspects of human life".

To some extent, hard and soft conceptions of sustainable development are ill-conceived. By inappropriately prioritising either social or ecological

dimensions they depreciate the very essence of the idea. Redclift (1991:7) suggests sustainable development may be about "meeting human needs, or maintaining economic growth or conserving natural capital, or about all three". The whole point of sustainable development, however, is that the concept is more than the sum of its parts. The value of the idea is fundamentally impeached by any approach which through partiality or prioritization implicitly reduces the concept to something less than that which a properly holistic conception requires. Unfortunately, whilst the strength of the concept lies in its integrity, grasping this unity is a task fraught with problems.

Dovers & Handmer (1992:262) suggest that what is needed is an "unprecedented integrative leap .... the scale and range of these issues is daunting .... and it has become increasingly apparent that none can be dealt with in isolation - that they are interdependent parts of a greater whole .... An approach which is not fundamentally integrative will fail". Indeed such a perspective is now widely accepted. Norgaard, for example, proposes what he calls a "view" or a "perspective" on sustainable development which he terms "co-evolutionary". By outlining linkages between ecological and economic paradigms he suggests that we can develop an understanding which, "helps explain why development has been unsustainable and what we must do to achieve sustainability". He emphasises the advantages of using different models simultaneously, "a linkage is quite different from a grand synthesis of previously incongruous paradigms. Through a linkage, each discipline enriches the other because of the differences. Neither discipline must abandon its past. Eventually, however, new emphases and approaches arise because of the enrichment." (Norgaard, 1988:525). Dickens (1992) similarly advocates that what is required is something more than an interdisciplinary approach. He argues for what he terms a 'new ecological paradigm'. The development of which he maintains, "is now being forced by environmental issues and related matters .... Such a paradigm rejects the distinctions between, for example the natural, the physical and the social sciences. It nevertheless entails a combination of these apparently alternative ways of viewing the social and natural worlds within a coherent epistemological framework" (Dickens, 1992:2). As Dickens himself recognises, however, the development of such a paradigm would necessarily involve a synthesis between a number of existing epistemologies which are often discordant and antipathetic - a profound and perhaps unrealistic undertaking.

1.3 **Some common ground**

Although the lack of any universally acceptable definition of sustainable development has led to a plethora of different interpretations of what the idea is and how it might best be approached, a range of themes and issues are common to many of these. Some of these, such as needs and equity, are derived directly from the Brundtland definition. Others, such as the requirement for a holistic approach, stem from the nature of the idea itself, as does the centrality which is normally given to the role of resources and to notions of limits and equilibrium.

The Brundtland definition of sustainable development places an explicit emphasis on the fulfilment of human needs. Human needs are however, in large part at least, subjective phenomena. They are geographically and temporally variable, defined by particular cultures and patterns of development. As Doyal and Gough (1991) point out 'needs' are different things to different people. Redclift (1992:8) puts it in these terms, "to Neo-classical economists needs are preferences; to the new right needs are dangerous; to Marxists needs are historical; to anthropologists needs are group specific; to radical democrats needs are discursive; and to phenomenologists they are socially constructed". According to Skolimowski, distinctions can be made between "genuine" and "artificial" needs: genuine needs comprise basic biological needs, cultural needs which contribute to the well-being of human beings as socio-cultural agents, and subjective needs which contribute to the well being of individuals as unique and perhaps idiosyncratic entities. Artificial needs, he suggests, are those which:

> ".... appear to contribute to our well-being, social or individual, yet upon closer inspection turn out to be insignificant, spurious, or even detrimental in the long run. The consumerist society has developed a powerful machinery for promoting a great variety of artificial needs. Its fatal flaw lies here. It assumes that the greater the scope of our choices, the greater the scope of our freedom and, consequently the greater the scope of our humanity. It fails to notice that so often these are false choices leading to the cultivation of needs which do not extend our being but shrink it" (Skolimowski, 1980:16).

Another aspect of sustainable development which stems directly from the Brundtland Commission definition is that of inter-generational equity. This is normally taken to mean that the global resource base should not be degraded in ways which deprive future generations of the ability to attain a level of well-being equivalent or superior to that achieved today. This has relatively

straightforward implications for the ways in which flow or continuous resources are exploited, but becomes more problematic when policy regarding stock resources is considered. Moreover, in both of these cases, the position becomes much less clear when possible advances in technology are included in the analysis. Environmental economists tend to argue that it may be desirable to exploit natural resources in ways which degrade the overall natural resource stock, providing losses of 'natural capital' can be substituted for by future developments in 'human capital' (Pearce and Turner, 1990; Barbier, 1989). However, this position assumes the potential for incremental gains in the utility of available technology, and beyond this, it pays scant regard to the not indefensible contention that far from being a panacea, technology is a key factor underpinning many of the world's contemporary problems.

To some extent, concern for future generations appears to have diverted attention away from consideration of the lack of equity manifest in present day patterns of development. To many analysts development is a moral concept which implies both the maximisation of well-being and the progressive achievement of equality in society. From this perspective present day patterns of uneven development are both morally unsustainable and a barrier to the achievement of more sustainable patterns of development in the future.

Almost all definitions of sustainable development place a central significance on the role of resources. Certainly, many visions of unsustainability are founded on the contention that resources are being degraded or destroyed. Although she is clearly critical of these neo-Malthusian conceptions, Rees also points out that an overly cornucopian outlook is equally insupportable:

> "Resources cannot be defined in physical terms, nor can scarcity be regarded as a problem in any narrowly physical sense. It is now largely accepted that in the foreseeable future economic development will not be brought to a catastrophic halt as it hits the stock resource availability barrier. Nor does it appear likely that market imperfections, geopolitical problems or environmental controls will create any really significant mineral scarcity problems for the now advanced nations. However, it is not possible to be so sanguine either about the future for countries in the Third World or about the continued availability in all societies of environmental resources". Rees (1990:58).

As Rees suggests, access to resources is unequal and spatially differentiated and its seems likely that a range of 'environmental resources' are being modified in ways which prejudice future development not just in the South

but throughout the world. From this perspective, it is perhaps more useful to consider those technical, economic and social processes which serve to define and redefine particular resources and the resource base as a whole. Thus an understanding of the contexts and processes which underpin the overexploitation of resources may be crucially significant. As Harvey explains:

> "'Resources' can only be defined in relationship to the mode of production which seeks to make use of them and which simultaneously 'produces' them through both the physical and mental activity of the users. There is, therefore, no such thing as a resource in the abstract or a resource which exists as a 'thing in itself'" (Harvey, 1977:226).

This, clearly is the case but, as Moore (1993:396) points out, "to say that resources are socially produced and culturally constituted does not, however, make them any less real or material". Neither does this lessen the material significance of the unsustainable practices and events which tend to be associated with the dynamic definition and redefinition of resources. What this does suggest, however, is that these materially unsustainable practices and events cannot be fully understood outside the social and economic contexts in which they occur.

Sustainability debates thus need to move beyond the somewhat naïve conceptions of a 'resources crisis' engendered by publications such as 'Limits to Growth' (Meadows *et al.*, 1972). However, whilst the need for a more sophisticated understanding of resources is widely recognised (see for example, Rees, 1990), many current conceptions of sustainable development still adopt an approach not so very far removed from that of the neo-Malthusians during the 1970s (Benton, 1994:33). Currently prevalent concepts such as 'maximum sustainable yield', 'carrying capacity' or indeed the idea of 'trade-offs' all imply the existence and significance of materially defined limits. English Nature are quite explicit in advocating an approach to sustainable development which incorporates trade offs within certain limits:

> "English Nature suggests that there is considerable merit in both the 'trade-off' and 'limits' versions of sustainable development. On certain occasions, the most appropriate version will be the 'limits' model, on other occasions, it will be the trade-off model. One of the key tasks of strategic planning is to indicate which aspects of the environment can be 'traded off' and which act as 'sustainability limits' .... considerations of scale will produce a hierarchy of sustainable limits" (English Nature, 1992:5).

Owens (1994) similarly sees a central role for limits defined by 'critical natural capitals' within the planning process. Healy & Shaw (1994) use the term

'capacity' in a similar context. The requirement for such limits appears to be both intuitively obvious and logically inescapable. That said, at least three problems emerge directly from this. First, it is profoundly difficult to determine where such limits should be set in a truly objective manner, a difficulty which is compounded by the fact that the optimum location of such limits will most certainly change through time. Second, as Adams points out any determination of physical limits is not very meaningful and is even less useful outside the social context in which it occurs:

> "In Our Common Future, sustainable development was based on two concepts. The first of these was the concept of basic needs and the corollary of the primacy of development action for the poor. The second involves the idea of environmental limits. These limits are not, however, set by the environment itself, but by technology and social organisation. Physical sustainability cannot be secured without policies which actively consider access to resources and the distribution of costs and benefits" (Adams, 1993:211).

Third, and perhaps even more significant, is the fact that conceptions of sustainable development which begin from the premise that such limits need to be determined and then policed predicate particular and arguably ill-conceived approaches to the promotion of sustainable development. They ask the wrong questions, they result in largely irrelevant answers, they lead directly to inappropriate strategies. Such approaches are problematic because as Adams suggests they address a target which is constantly moved by technological innovation and changes in social organisation. But this is a mere technical difficulty, it is not the real problem. In themselves, such strategies will always be inadequate because however pragmatic and apparently positive they may appear, they address the outcome rather than the cause of the problem. In itself this is insufficient and inadequate. Approaches of this type focus on the question of *where the line should be drawn and how it might best be policed.* This is, at best a secondary question. The question which we should be asking is *why the line will always tend to be crossed wherever it is placed.*

A logical, but frequently overlooked, corollary of the suggestion that sustainability is defined by limits is that any truly sustainable mode of development must maintain some form of equilibrium. It may be possible to maintain the viability of other types of system in the short term, but in the end, non-equilibriated systems cannot be sustainable. For example, fishing effort which exceeds an ecologically determined maximum sustainable yield can be sustained by increasing effort or through the use of subsidies, but in

such cases equilibrium is achieved artificially (Drummond and Symes, 1996). Truly sustainable systems must be capable of existing in equilibrium with themselves. That is to say, for development to be truly sustainable its dynamism must be internalised. No sub-system which borrows from other geographical or temporal subsystems of what is in practice a finite system - i.e. the earth - can be sustained indefinitely. It may be possible to rob Peter to pay Paul in the short term, but this can only be a temporary strategy.

That is not to say that sustainable development needs to be conceived of as some fossilised steady state system. Given that the various constituent dimensions of sustainability are by their nature dynamic, it surely follows that sustainable development cannot exist as some simple equilibrium state which can be regulated by reference to constant limits and some simple notion of balance between the various dimensions. This is not in itself a problem, systems can, and do, exist in states of dynamic equilibrium where the conformation of the system changes but within which an essential balance is maintained.

Ideally then, a truly sustainable system would be one in which all processes were internalised by virtue of what the system was. As Pierce suggests "in the end sustainable development will be a self-enforcing process capable of achieving its own equilibrium" (Pierce, 1992:318). From this perspective, sustainability would be achieved through some form of homœostasis - it would occur because of the nature of the mode of development rather than through any form of environmental management or social policy. In such a system sustainable development would be normative. However, whilst it is sometimes described as such (see for example Pearce, 1995:9) sustainable development, in itself at least, is clearly not a normative theory. Most certainly, it is not a normative theory in the sense of, for example, central place or industrial location theories, which suggest an objective and logically determinable position towards which real world patterns will, or at least ought, to gravitate. Indeed, one might well argue that while 'development' - capitalist development at least - may promote patterns which are 'normic' in that they reflect certain laws or tendencies, the outcomes which tend to occur are for the most part, antipathetic to notions of sustainability.

Although some form of equilibrium appears to be essential to sustainability, it is far from clear whether any conceivable system will be truly homeostatic in the sense that it maintains its own equilibrium. The problem here is that it is

equally uncertain whether it would be possible to devise forms of regulation which would impose equilibrium on a non-homœostatic system. Yanarella and Levine begin to outline how some form of 'homœostatic balance' might be achieved in practice:

> "Activities or processes are neither good nor bad when taken by themselves. Instead a desired activity can take place in a larger system only by finding its balances within that more encompassing system. In order to seek such a balance, the process must have a context or system within which the balance may occur. It is thus a question of relationships. For, even when a new component introduced into the existing system of relationships upsets the balance of the larger system, a counter-tendency may be set in motion whereby the larger system responds to the change by striving for a new state of equilibrium" (Yanarella and Levine, 1992:770).

1.4 **Current approaches to sustainable development**

Most extant approaches to the articulation and operationalisation of sustainable development fall into one of three categories: those which assume that such a state can be managed; those based on adherence to certain principles or the management of certain 'currencies'; and the model of sustainability derived from environmental economics. All of these general approaches appear to flawed.

Notwithstanding considerable rhetoric about value shifts and the like, the actuality of the unsustainable is material and often pressing, and it is this actuality which is most obvious and most readily addressed. When one also considers the fact that sustainability policy is normally constructed and enacted within discrete politically defined spaces, it is perhaps not surprising that in practice most attempts to promote sustainable development have involved concrete measures designed to prevent or control specific aspects of development directly. One currently widespread approach to sustainable development cedes a central significance to "the fundamental questions of how general principles of sustainability can be translated into specific contexts .... how we can appraise the sustainability of alternative systems, how can we promote sustainable development in differing contexts?" However, the same authors also point out, with perhaps a degree of understatement, that "difficulties arise once specific applications are called for" (Hodge and Dunn, 1992:99).

Within this, one key question revolves around identifying the most appropriate level for strategy. As Pierce (1992: 315) points out, "a formidable obstacle .... is matching the problem with an appropriate level of decision making". In practice, there are a wide range of prescriptions regarding the most appropriate scale at which the concept might be operationalised. One perspective on this problem is adopted by Gardner (1990:337), who argues for a bottom-up approach in which decision making at the community level provides the framework for "achieving development to meet the needs/aspirations of the local population, respects cultural diversity, and maintains ecological systems". O'Riordan (1991:5), adopts a similar position when he advocates "the powerful growth of more organically structured social networks based on the practice of collective self-reliance and community-based power. This is the essence of eco-development which still has to emerge in any realistic form, but which will be one of the main tenets of sustainable development when it finally arrives". Such a perspective is perhaps attractive in that it would not only engender a degree of autonomy to local populations, but also because it would allow for a flexible articulation of sustainable development. A factor which may be significant if, as Pierce (1992:317) suggests, "far from being a monolithic concept, sustainable development will vary over space and time".

Not all approaches focus on this scale however. Nijkamp and Soetemann (1988:626), use the term 'area management'. Norgaard (1988) argues for 'regionally sustainable systems'. The Caring for the Earth Report (IUCN, UNEP, WWF, 1991) advocates a nationally based approach with each region being treated as an integrated system within which the carrying capacities of these systems and the needs of indigenous populations can be used as the basis for policy formation. A nationally based framework would, to some extent at least, address the problem that otherwise suitable regions may well not be congruent with relevant institutional structures. Notwithstanding the role of supra-national governments and agencies, the state remains the locus of most regulation.

There are, however, a number of general difficulties in articulating sustainable development within any discrete spatial framework. As Dovers and Handmer (1992:262) suggest, "the task nations face will be compounded by the fact that their own particular challenges, in more and more cases, can no longer be dealt with in isolation but must be placed in the context of global environmental change and the global economy". Certainly, it seems to be

unlikely that sustainable development can be achieved with discrete, small scale, units. At least not if that development involves meeting the material needs of the population. Most of the features of development which we consider to be vital in that they improve human well-being - health care, education, food security, etc. - are dependent on a complex system of production. From this perspective, sustainable development cannot be achieved at a purely local level. Moreover, the problem is not just that individual regions are dependent on external linkages, it must also be the case that the sustainability of society as whole is ultimately dependent on the sustainability of its constituent elements. Development - in the sense of increasing human well-being - is not threatened by the collapse of any single enterprise, but it must be dependent on the cohesive aggregation which the individual elements constitute. In practice, it may well be that the sustainability of society as a whole is dependent on some form of structured coherence. Although the totality of development is constituted in specificity, a substantive approach to sustainable development necessarily transcends the limited scope of specific policies or measures. In this sense the problem is not so much the geographical scale at which policy is articulated, but rather the nature of the policy measures being used.

Redclift is particularly critical of what he terms 'environmental managerialism' something which he suggests:

> "begins with problems and attempts to solve them in a more ad hoc, piecemeal fashion. The paradigm is a positivist one, that assumes responsibility for resolving issues with whatever technical means are at our disposal. Thus the armoury of environmental managerialism consists of different methodological techniques, each of which enables the environment to be better 'managed'. This is the shallow end of the 'deep' ecological swimming pool" (Redclift, 1988:638).

Approaches of this type are unlikely to be truly effective for a number of reasons. Development inevitably involves trade offs between the environment, economic growth and social costs and benefits. Where unsustainable events are addressed directly, the determination of what trade offs are appropriate is almost invariably more or less subjective. The market aside, no truly objective methodology exists whereby trade-offs can be evaluated and determined in anything other than a subjective manner. Moreover, the smaller the scale of the approach the more difficult it is to ensure even a degree of objectivity. Thus both the objectives and instruments of management are always going to be uncertain and contestable. Narrowly focused approaches also require the

ability to regulate effectively in a detailed, co-ordinated and integrated manner throughout the whole gambit of human activity. However, as Hayek (1988) suggests, contemporary societies and economies are so complex that adequate knowledge for large scale planning cannot possibly exist. Thus, 'end of pipe' measures, are unlikely to control development in a coherent and effective manner. Certainly, it seems to be highly improbable that sustainable development can be effectively promoted solely through use of concrete forms of regulation which address specific problems, be they prohibitive legislation, fiscal measures, or whatever. Problem definition in these cases tends to inadequately incorporate social action and process as dynamic and potentially reproducible forces. Such an agenda is flawed in its conception, and it is probably untenable. The effective articulation and operationalisation of such an approach is almost certainly beyond the scope of human agency. It would require the management of what is in practice the unmanageable.

A number of approaches to sustainable development are based on the premise that whilst managing development in all its complexity is a seemingly impossible task, it may well be possible to base such management around a series of 'principles' or 'currencies'. Agenda 21, for example, promoted such an approach as, to a large extent, does UK government policy (Secretary of State for the Environment *et al.*,1994) A similar position is proposed by Dovers and Handmer who advocate the utility of a systems based approach to understanding and operationalizing sustainable development, "the first principle is the need for a systems approach: accepting and designing approaches which suit the axiomatic proposition that the sustainability is a whole-system problem. Sectoral or single issue approaches are clearly inadequate" (Dovers and Handmer, 1992:274). They argue that a systems approach is the "logical place to begin" because it allows progress which could not be made through "increasing efforts in specialisation and reductionism". They quote Laszlo to substantiate their conviction:

> "A systems approach can look at a cell or an atom as a system, or it can look at the organ, the organism, the family the community, the nation the economy, the ecology as systems and it can view even the biosphere as such. A system in one perspective is a subsystem in another. But the systems view always treats systems as integrated wholes of their subsidiary components and never as the mechanistic aggregate of parts in isolable causal relations" (Laszlo, 1972:14)

At face value such assertions would appear to suggest that systems theory may well have some relevance to the articulation of sustainable development.

Such an approach might allow analysis which simultaneously addressed the concept at different scales. As Dovers and Handmer suggest:

> "Given a whole-system approach, and the absence of any hope for complete information (or for its use in much decision making even if it existed), system-wide factors and indicators should be a priority, both in terms of understanding system behaviour and identifying policy options with effective generic potential. An example here might be that, following a recognition of energy and money as basic system 'currencies', and the former as a prime indicator of societal load on the environment, energy taxation seems a logical area for exploration when assessing policy instrument choice for sustainable development." (Dovers and Handmer, 1992:275).

Consideration of the nature of 'regulation' in an ecosystem may provide a useful analogy here. An ecosystem can be as small as a garden pond or as large as the earth itself. Typically, however, whatever its size an ecosystem is an extremely complex system with numerous and often subtle inter-relationships. Inter-relationships which because of their number and diversity cannot be completely understood, at least, not in the sense of having a perfect understanding of the totality of relationships which the system embodies. Notwithstanding this, ecosystems exist in a state of quasi-equilibrium. Whilst numbers of particular species fluctuate in the short term, a tendency exists for the system to regress to some 'normative', equilibrium position. This regulation is not achieved through the purposive actions of its constituent elements for many are not sentient and none are capable of such management. Rather regulation is achieved by virtue of the nature of the system.

The key controlling mechanism in any ecosystem, the medium of higher order regulation, is to be found in the flows of energy through the system. Initially the system is fuelled by external inputs of energy, but more than this, it is internal flows of energy which 'regulate' the system towards some normative equilibrium state. Such an observation would suggest that attempts to modify any ecosystem would be most effective if intervention were to be targeted at those locations where flows of energy are most concentrated and possessed of the greatest influence on (i.e. power over) the overall pattern of system dynamics: either at the level of inputs to the system or in the higher trophic levels of the system. What we find in flows of energy through the system is a general factor which transcends the heterogeneity and complexity of which it is composed. These flows represent a key determinant of system dynamics which can be measured and modelled. It is here that we find what Dovers and Handmer (1992) term "system-wide currencies". Currencies which offer the

possibility that complex systems can, albeit in a 'grey box' manner, be purposively managed.

Dovers and Handmer suggest that the value of a systems approach is, to use their terminology, 'axiomatic'. In practice, its utility is perhaps more questionable. How sensible would it be to assume that something akin to 'monetarism' might promote sustainable development when history would suggest that such an approach cannot even ensure a sustainable economy? In practice, it is far from clear what currencies are appropriate or how these should be managed to produce sustainable development.

Suggesting that sustainable development can be achieved through adherence to certain 'principles' appears to reduce the requirement for 'managerialism', but this is largely illusory. Subjective and insubstantial definition of principles or currencies and subsequent attempts to apply these without any really adequate understanding of their detailed significance is hardly likely to be effective. The real need is to move beyond managerialism, and the one extant approach which claims to achieve this is that based on environmental economics.

According to Dickens (1992:13), "neo-liberals see the promotion of successful market economies as the principle means through which ecological and environmental problems can be solved". As Rees puts it proponents of the market claim "impersonality, neutrality and freedom from political pressures" which are sharply contrasted with the:

> "imperfect, value-laden self-interested human beings who feature in more bureaucratic regulatory regimes .... theoretically at least, economic incentives give producers the freedom to find the most cost-effective methods of pollution control and resource conservation, while also enabling consumers to establish the desired mix and allocation of resource goods and services. If properly programmed, markets could ensure that critical resource and environmental limits were respected, but also allow individual cultural groups to select their own sustainable development packages with variable 'contents'" (Rees, 1992:386).

Neo-liberal interpretations of sustainable development typically suggest that the concept involves "maximising the net benefits of economic development, subject to maintaining the services and quality of resources over time" (Pearce and Turner, 1990:42). According to Barbier (1989), this entails identifying the optimal level of interaction between biological, the economic and the social systems through a dynamic and adaptive process of trade-offs. Pearce and

Turner, similarly emphasise the importance of trade-offs between present systems and between generations; a viewpoint which leads these authors to suggest, "the issue, then, is how we should treat natural environments in order that they can play their part in sustaining the economy as a source of improved standard of living" (Pearce & Turner, 1990:43). They also argue that there is no imperative requirement to preserve any particular elements of the natural environment, they write in terms of "substituting man-made capital - machines, factories , roads, - for natural capital. Indeed traditional economic growth has proceeded on this basis: machines have substituted for animal power, electricity for fuel wood, artificial fertilisers for organic manures, and so on" (Pearce and Turner, 1990:48). Whelan (1989:29) extends this argument to what appears to be its logical conclusion by suggesting that resources should be exploited rather than conserved because "market forces and human ingenuity will always take care of shortage by providing solutions which leave us better off than we were before".

The problems of this approach are however well known. See for example, Jacobs (1994), Redclift (1988). The utility of an approach based on neo-classical economics is also questioned by Pierce (1992:308) who suggests that "in neo-classical economics there is an 'atomistic-mechanical worldview' in the identification of and solution to economic problems. In theory, natural capital is divisible and indistinguishable from human-made capital", something which he suggests is one of several factors which have allowed "economic systems to diverge from natural processes". Moreover, such an approach entails, however implicitly, a requirement for continued technological advancement, and perhaps even more significantly, an assumption that ecology-technology trade offs are both propitious and possible indefinitely. An assumption which Pierce (1992:308), considers to be ill-conceived, "many economists have mistakenly assumed that the possibilities for substituting human-made capital for natural capital are unlimited".

Certainly the idea of sustainable development is necessarily somewhat wider than any notion of sustainable economic development or sustainable growth, as English Nature point out:

> "'Sustainable growth' implies a modification of the objective of economic growth, as conventionally measured by GDP. The concept of sustainable development is not based on economic growth .... development implicitly incorporates a range of social objectives which include economic growth but which may also include improvements to health, employment, environmental quality and other indicators of well-being. The adoption of sustainable

> development as a social goal therefore implies not just that environmental considerations must be taken into account but that other non-income factors are material as well" (English Nature, 1992:19).

An even more basic caveat is raised in the Caring for the Earth Report (IUCN, UNEP, WWF, 1991) which points out the logical impossibility of 'sustainable economic growth' - no growth can be sustained indefinitely. If, as would seem to be the case, this simple observation is a valid one, it has very significant implications regarding what can and cannot be sustained and how sustainability might usefully be promoted. For example, it follows from this observation that any attempts to sustain economic growth can only be temporary. In one respect, this would not seem to be particularly problematic, few would argue that economic growth is an end in itself. It is, however, only a small step from this recognition to an appreciation that attempts to sustain the unsustainable, that is ultimately untenable attempts to maintain economic growth, almost inevitably involve the over-exploitation and devalorisation of both human and natural resources (Drummond and Marsden 1995a; Drummond, 1996).

Some writers not only reject neo-liberal approaches but suggest that sustainable development can only be achieved within a socio-economic order radically different from that which exists today. O'Riordan, for example, suggests that sustainable development may well prove to be an "inoperable concept", not least because:

> ".... this problem is compounded in the contemporary world by the influence of capitalist forms on the alienation of humanity from the natural world .... it draws more from the environment than it returns yet does not pay for the loss of that environmental capital .... Certainly, it will mean the redistribution of wealth, technology and opportunity from the affluent to the poor in the interests of collective well-being. It will also involve patterns of development that ensure minimal resource exploitation" (O'Riordan, 1991:7).

Redclift sees particular features of capitalism, especially uneven development, as constituting major barriers to the achievement of sustainable development:

> "Natural resources are systematically depleted in the accumulation drive by both private and multinational capital and the state. Ecological degradation in the South assumes emergency proportions through the mindless commitment to the economic growth strategy endemic to developed capitalism. The costs of this development are expressed not only in terms of class conflict and economic exploitation, but also in the reduction of the natural resource base upon which the poor depend for their livelihood" (Redclift, 1987:38).

Bahro (1984) also sees the nature of capitalist production and consumption in the North as being central to contemporary environmental problems. He suggests, however, that traditional socialist prescriptions are unlikely to undermine global capitalism. Similarly, Dickens (1992:7), points out that, although modern capitalism may indeed underpin many if not all contemporary environmental problems, the idea that the solution to these problems lies in the overthrow of capitalism is, to use his terminology, 'somewhat outmoded'.

This probably is the case, but a key problem here is that current political structures may well be ill-suited to the promotion of new and more sustainable modes of development. The perceived immediacy of many of the problems which sustainability encompasses creates a situation in which apparently pragmatic, but essentially ineffective, measures which address unsustainable events directly have considerable social appeal and political expediency. This situation is compounded by the inherent conservatism of extant institutions and power structures which, by their nature, tend to favour incrementalist tinkering over more radical solutions. Allied to this, an increasingly neo-liberal political agenda throughout the world has tended to focus attention on 'cornucopianist' and market led strategies which again are of highly questionable efficacy. Thus what has emerged is an unholy and impotent mixture of bureaucratic, technocratic management strategies formulated within a positivist, modernist paradigm and ideologically defined market-based rhetorics; both of which are demonstrably and manifestly inadequate and inappropriate from a sustainability perspective.

While the need for more radical approaches has been widely espoused, these have hardly gained any real political credibility or for that matter widespread public support.

> "The notion of a sustainable society is radical. Sustainable development confronts modern society at the heart of its purpose, because the human race is, and always has been a colonising species, without an intellectual or institutional capacity for equilibrium (O'Riordan, 1993). Existing patterns of production distribution and consumption thrive on creating externalities in the form of pollution, habitat loss and ubiquitous waste disposal. Yet, it must be said that the present society is supported by a democracy that is led to believe that its best interests are served by minor adjustments to the status quo" (Pearce, 1995:184).

Pearce also outlines the implications of this: "translated into realisable political action, sustainable development is more about changes of emphasis than a wholesale restructuring of decision making. At best it is likely to involve a further movement of environmental concerns up the political agenda" (Pearce, 1995:10). Thus there is an impasse: peripheral, palliative measures are possible and indeed often politically expedient, but these are at best superficial, and while it is increasingly apparent that what is really needed are more profound changes in the nature of development, the radical nature of such an agenda makes it politically and practically untenable.

1.5 **The status quo**

Both the theory and practice appear to have reached something of an impasse. This impasse reflects the congruence of several key difficulties. First, The concept is ambiguous and open to a wide variety of interpretations. Not only does this allow the idea to be misappropriated to support a range of agendas, it has also caused many analysts to become unproductively bogged down in the search for the 'holy grail' of a precise and widely acceptable definition. Second, the concept of sustainable development is not only broad but also fundamentally integrative, and no convincing methodology exists for embracing, in a single moment, the totality of the idea. Whilst there is a perceived, and indeed demonstrably pressing, need to alleviate the central concerns of sustainable development, it is clear enough that cannot be adequately addressed by specific, direct measures. Certainly, ad hoc, end of pipe strategies will not produce sustainable development. Third, sustainable development is radical in that it threatens established social, political and economic structures, and linked to this, it may well be the case that established political structures are ill suited to the effective promotion of sustainable development. Fourth, it has proved to be very difficult to link broad philosophical and theoretical notions of what sustainable development with the concrete actuality of unsustainability. As Murdoch points out "so far, with a few notable exceptions, the literature on sustainability remains caught between high levels of generalisation and narrow technocratic concerns" (Murdoch, 1992:20).

The actuality of the unsustainable is often cruelly simple and unambiguous, but it is now all too clear that meaningful progress towards sustainability will not emerge from strategies which simply address the concrete actuality of

unsustainable events. In practice, most current approaches to sustainable development have addressed 'narrow technocratic concerns' in an atomistic and unembedded manner. The crucial point here is not simply that they have focused on specific problems and treated these discrete events, the tendency has been to dwell, quite inappropriately, on the questions of how, what, where and when whilst a more useful starting point is why - why does the tendency to the unsustainable always seem to exist? Thus far, when the more incisive question of why has been asked, the debates have usually remained remote from the actuality of development.

1.6 **A new agenda**

If thinking on sustainability is to be progressed the disjunction between theory and practice needs to be bridged. If this synthesis is to be achieved, it will in itself require a much more rigorous consideration of the relevance of mainstream social theory to sustainability. As Adams (1993:218) points out "theoretical clarification is necessary both for the debate to continue, and for sustainable development to have any long term credibility". Redclift begins to suggest how this theoretical clarification might be achieved:

> "If we are to meet the problems presented by imminent global nemesis, we need to go beyond the assertion that such problems are themselves socially-constructed. We need to embrace a realist position, while recognising and acknowledging the relativism of our values and our policy instruments. The challenge is to develop a 'third view' which enables us to assume responsibility for our actions, while exploring the need to change our underlying social commitment. We need to develop a broader and deeper foundation for the formulation of a realist policy agenda" (Redclift, 1992:22).

Although as Redclift suggests it would be arrogant indeed to claim any unique truth in a particular approach, it is surely the case that progress requires a more substantive and authoritative approach than currently exists. This thesis is a search for Redclift's third view. It is a search for practical adequacy rather than any unique truth. It seeks to incorporate rather than dismiss many of the other approaches which have been cited here by considering, quite literally, the ways in which a realist policy agenda might be defined and operationalised. It aims to go beyond the assertion that unsustainability is socially constructed by identifying and analysing the processes of structuration which link economic and social structures and processes to actual examples of unsustainable development.

The majority of existing approaches work backwards from the bottom line of biologically defined sustainability metrics and thus they fail to respect either the multi-dimensional nature of sustainable development or the need for truly integrative solutions which this implies. By virtue of what they are, such approaches tend to conceptualise the situation in terms of a line one side of which lies sustainability, but beyond which lies unsustainability. The problem here is not so much that the definition of this line is often technically difficult, uncertain and contestable, although clearly it often is. The real problem lies in the fact that asking where, precisely, the line should be drawn is the wrong approach. What should be explored is why and how the line will tend to be crossed wherever it is drawn. This is the question which will be addressed in this thesis.

Approaches which begin from this position have the distinct advantage that they largely circumvent the need for any precise definition of exactly what sustainable development is. This is important because equivocation and contestation here have proved to be a major barrier to the active promotion of sustainable development. From this perspective, it is the processes and mechanisms which produce unsustainable outcomes and the conditions in which these operate which are important rather than the outcomes *per se*. Thus the need to precisely demarcate some sustainable-unsustainable boundary becomes largely redundant. What becomes crucial here, however, is the way in which the causality of the unsustainable is understood and explained. This thesis attempts to progress this understanding by drawing insights from two strands of social theory: realism and regulation theory.

Modern conceptions of realism delve beneath surface level appearances to provide a multi-layered, powerful and practically useful basis for understanding the causality of unsustainable practices and events. The realist mode of explanation provides an interpretation of unsustainable events and practices which extends beyond that provided by more positivist interpretations, and can thus begin to elucidate how sustainable development might be addressed in ways which transcend the limits of what Redclift terms 'environmental managerialism'. The realist mode of explanation explains events in terms of conjunctures between structurally defined, tendentially expressed causal mechanisms and contingent factors. Most current approaches to sustainability attempt to influence the causality of unsustainable events at the level of contingency. This is clearly inadequate, but realism provides the opportunity to explore the potential to influence the tendencies involved as well as contingent factors. Moreover, it provides the

opportunity to do this in an objective manner. Realism suggests that actual events depend not just on contingent factors and whether particular mechanisms are present, but also on whether these mechanisms are 'activated'. It is argued in this thesis that mechanisms significant in the causality of unsustainable modes of development are selectively legitimated and empowered by what regulationists term the 'mode of social regulation', and that this selectivity is biased. Because of their particular bias, current modes of social regulation tend to condition development in unsustainable directions. Understanding this conditioning so as to be able to modify it in an objective way may well be crucially significant to the achievement of sustainable development.

Regulation theory is centrally concerned with the contradictions and crises which emerge within capitalist economies and the ways in which these are addressed by society. Implicitly at least, it is centrally concerned with why and how some aspects of development are sustained whilst others are devalued and degraded. If we accept that sustainability will, necessarily, be sought and achieved within capitalist economies, insights from regulation theory have some considerable relevance to sustainability debates. Crucially, regulation theory suggests why some unsustainable events and practices come about as disequilibria generated from within the capitalist accumulation system are translated into the materially and morally unsustainable events as internally generated tensions are exported beyond the system itself. A regulationist perspective also begins to suggest how we might seek to condition a more sustainable future through the construction of new and different modes of social regulation. Understanding the role of modes of social regulation and the ways in which they condition the actuality of capitalist development is important to understanding how sustainable development might best be promoted. If thinking on sustainability is to be progressed, attention must be directed to the ways and potentialities of present systems of economic and social regulation; assessing how these may begin to bring about institutional and value change at the social and economic level. Potentially effective policy formation requires a thorough understanding of how the dynamic and volatile nature of development itself predicates the adoption of practices which involve unsustainable forms of exploitation and how these are able to achieve their own social and political legitimacy. As Benton (1994:50) suggests we need "to recognise that what is 'out of control' is not some mysterious *telos* of history, but the key institutional process of corporate control, state power and scientific innovation.

A realist methodology allied to an appreciation of the role of modes of social regulation in capitalist societies provides a conceptual framework within which progress can be made here. Historically, 'regulation' has been centrally concerned to maintain the value of capital and fixed assets. The achievement of sustainable development obligates a broader remit in the future. If this expansion is to be promoted, an understanding of what must be regulated and how and at what level this might best be achieved becomes crucial.

Chapter 2. REALISM: UNDERSTANDING THE CAUSALITY OF THE UNSUSTAINABLE

This chapter attempts to demonstrate how a realist methodology can provide a multi-level understanding of the causes of unsustainable practices and events. From a realist perspective unsustainable practices and events are seen as outcomes rather than as discrete or purely contingent events and this has important policy implications. Beginning with a review of modern conceptions of realism, the chapter then discusses how these define a methodology relevant to progressing understanding of sustainability issues and the basis of new forms of regulation. It is suggested that a particular significance attaches to the conditions which selectively activate structurally defined causal mechanisms.

2.1 Realism and sustainable development

A central tenet of this thesis is that if unsustainable development is to be addressed and purposively prevented, a fundamental significance attaches to the way in which the causality of unsustainable practices and events is understood. Developed largely from the work of Bhaskar (1975, 1979), modern conceptions of realism posit a particular understanding of causality which may have considerable utility to this agenda.

Critical realism not only provides a means "combining insights from a number of disciplinary perspectives .... without sinking into deep and irretrievable eclecticism" (Dickens, 1992:177). It also overcomes the nihilistic logic of fundamentally relativist positions. Its particular utility here, however, lies in the opportunity which it affords to move beyond approaches to sustainability which address the actuality of development directly. The nuanced and multi-layered explanation of causality provided by realism can elucidate new and potentially more efficacious bases for regulation. As Lovering (1990:39) puts it;

> "Critical realism holds that reality, including society, is made up of deep structures which condition and make possible the 'events' we observe in everyday experience and, importantly, in scientific research."

This thesis will explore the ways in which development is 'conditioned' by these 'deep structures'. The suggestion being that present day modes of development are conditioned in ways which make unsustainable practices and events the norm, and that it may be possible to modify this conditioning to produce more sustainable patterns of development. In exploring the potential of such an approach, however, it soon becomes clear that neither general assertions regarding the exploitative nature of capitalism nor vague and

unembedded prescriptions for value change in society are adequate. The relationship between the abstract and the concrete, and in particular the processes of structuration which link the real and the actual need to be objectified in ways which make purposive and potentially efficacious intervention possible. Understanding sustainable development in these terms is problematic, but it may be the key to a sustainable future.

2.2 **The realist mode of explanation**

According to Outhwaite (1987:19) realism is a "common-sense ontology, in the sense that it takes seriously the existence of things, structures and mechanisms revealed by the sciences at different levels of reality". Bhaskar (1975) identifies three such levels or domains (see figure 2.1).

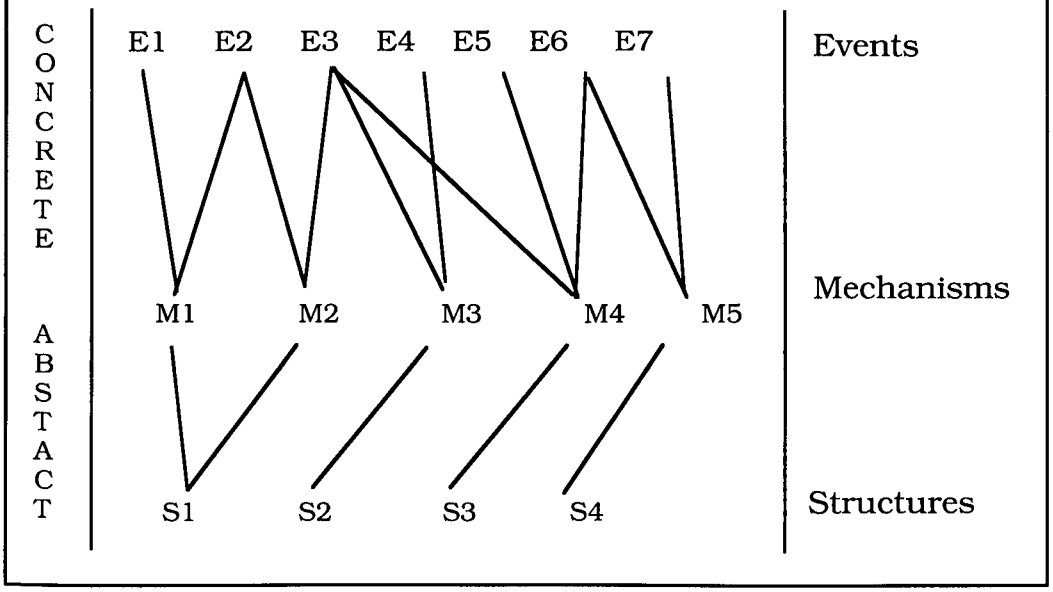
Figure 2.1. **The three domains of Reality (Bhaskar, 1975)**

	Domain of the real	Domain of the actual	Domain of the empirical
Mechanisms	√		
Events	√	√	
Experiences	√	√	√

Objects within the domain of the real give rise to structures, which by their nature, produce certain tendencies or mechanisms which act as causal agents, but such tendencies are invariably mediated through contingent conditions. Thus a particular mechanism may or may not produce a particular event. As Sayer (1984:99) suggests "for any particular set of conditions, the results occur necessarily by virtue of the nature of the objects involved, but it is contingent which conditions are present". Moreover, particular events within the domain of the actual may well be subject to complex patterns of causation involving plural and possibly countervalent causal mechanisms (see figure 2.2). Thus, this is a two stage argument: first, mechanisms may not be activated and second where they are, the effects depend on conditions. As Sayer suggests:

> "Events are causally explained by retroducing and confirming the existence of mechanisms, and in turn the existence of mechanisms is explained by reference to the structure and constitution of the objects which possess them. Where the same events are co-determined by several distinct causes, they may also be explained by calculating the relative contributions of each mechanism" (Sayer, 1984:214).

Figure 2.2 **Structures, Mechanisms and Events (Sayer, 1984)**



The realist mode of explanation and its relevance to the promotion of sustainable development is perhaps most easily understood by means of an allegorical example. Teachers faced with the problem of assessing mixed ability groups of students often set questions which they suppose allow 'differentiation by outcome'. That is to say questions which can be answered in different ways - some of which it is assumed are more sophisticated than others - but all of which are apparently sensible and correct. A good example of this is the seemingly straightforward question 'why do rivers meander?'. Secondary school pupils can, and do, answer this question in terms of differential patterns of erosion and deposition as a river flows more quickly around the outside of a bend than it does on the inside. Equally, however, faced with the same question undergraduate fluvial geomorphologists might well attempt to answer by reference to the laws of thermodynamics and the concept of entropy. In these terms a river meanders because it must seek an equal distribution of free energy throughout its length.

These examples of how we might seek to answer the question 'why' an event occurs - i.e. to explain its cause - are useful in that they help demonstrate the realist mode of explanation. Implicitly, at least, the second type of explanation offered here mirrors a realist approach to the understanding of causality. To understand why this is so we must consider the question in a little greater detail. In the second answer, explanation was formulated in terms of a generally applicable if unobservable determinant of causation - the second law

of thermodynamics. However, whilst all rivers are presumably subject to this same structurally determined causal power - i.e. the laws of thermodynamics ought to apply to all rivers - empirical observation would quickly suggest that not all rivers meander in practice. This apparent lack of general applicability might be seen as an indictment of the realist explanation. In fact, however, this inconsistency encompasses the essence and strength of the realist approach. Indeed, much of the appeal of the realist ontology lies in its ability to incorporate heterogeneous and differentiated outcomes within a unified multi-level mode of explanation.

Realism does not suggest that an object in the domain of the real - in the case of the meander, the second law of thermodynamics - acts directly to cause an event - for example a meander. Rather causality is understood in terms of tendencies and the mutuality of transformations in related objects in the real and actual dimensions. Thus whilst a river will always tend to meander it does not always do so in practice. The tendency to meander may be necessary for a meander to occur but it is not, in itself, sufficient for this to happen. The event - a particular meander in a particular place at a particular time - will only occur if certain contingent conditions are met. In this case, relevant contingencies might well include geological and climatic factors. Equally, the historical pattern of development in a particular case may constitute a significant element of contingency. In the case of the meandering river, for example, the concrete reality of the present must reflect historical patterns of erosion, and thus it must also effect the level of free energy in the system and it follows the potential for erosion which now exists.

Thus a river may or may not meander. Faced with the same tendency to achieve a redistribution of free energy, the river may for example become braided rather than meandering. In which case the tendency is still expressed in the domain of the actual - braiding will also serve to redistribute energy. However whilst realist theoreticians speak of 'conjunctures' of real causal mechanisms and contingent factors which combine to produce a particular event, it is important not to conceptualise structurally defined tendencies as often latent mechanisms which are, on occasion, triggered or enabled by particular contingent factors. A realist philosophy rejects the idea that objects in different domains are discrete and understandable in isolation. Rather it stresses the mutuality and interdependence of objects in different domains. Thus whilst a tendency to equalise the distribution of energy within the system may well be significant in meander formation, the formation of a

meander will itself reconfigurate the real object and its associated tendencies. This must be so for the formation of the meander necessarily redistributes energy in the river system.

If we accept that the prevention of the unsustainable is a fundamental goal of sustainable development, then such an understanding of the causality of these events achieves considerable significance. If, for example, we desired to prevent a river from meandering, one strategy would be to devise an engineering solution designed to prevent erosion. A more subtle approach, and quite probably a more efficacious one, would seek to regulate the flow of the river. That is, it would seek to influence the tendency to meander rather than to prevent its expression. The contention here is that it may be possible to address unsustainable events in a manner analogous to this, and that multi-level conception of causality posited by a realist approach potentially provides powerful conceptual framework within which to pursue such an agenda.

2.3 **Real problems?**

By rejecting the 'correspondence' version of truth posited by more positivist epistemologies (Keat and Urry, 1982:18), critical realism accepts that:

> "All knowledge must be considered to be not only fallible but also necessarily open to immanent, or ongoing, critique, In short 'Truth' must be considered to be conditional and not as absolute" (Pratt, 1995:66).

This acceptance clearly has significant methodological connotations, and also has important implications for the utility of the realist approach itself (Keat and Urry, 1982:40). In practice, critical realism has tended to be legitimated in terms of either Bhaskar's (1979) 'transcendental' view of realist philosophy which postulates a reality external to social construction; or in terms of its 'practical adequacy' (Sayer, 1984; Latour, 1988). As Sayer (1984:330) suggests:

> "We can't get outside discourse to see how it compares with real objects, but it is evident from observation and action within a particular world-view or discourse that some conventions about what is the case hold and others don't".

A key problem for realism, however, has been to what extent human agents can transform structures (Craib, 1992:20). It may be clear enough that social structures are not independent of society and consequently that such

structures are not detached from human experience or action, but it is also the case that a researcher can only exist in the domain of the empirical and can thus have no objective knowledge of the real. As Lovering points out a realist understanding predicates a view of history within which human agency is both circumscribed and uncertain of its potential efficacy:

> "Causal laws and 'laws of history' consist in the constraints and enablements which the deep structures of a particular society entail. They decree what is possible and what is not in a particular historical situation. But deep structures do not work by some sort of analogy to a mechanical process. Social structures are primary causal forces, but they do not exist independently of the 'surface level' of human experiences and actions. Structures cannot survive without those everyday practices, as the latter form the conditions of existence of the 'deeper' social structures. The picture which critical realism offers is one in which individuals enter into a world which is not of their own choosing, and once there they act in ways which partly reproduce, partly transform the structure of that world. But their understanding and ability to control these structural effects are severely limited, and social entities and structures are often reproduced as unintended effects of individual actions" (Lovering, 1990:38).

Although Lovering's caveats are clearly well founded and significant, it may well be that a realist ontology can still serve to inform and thus empower agency. Events, including unsustainable events, reflect the particular interactions of agency and structure. Embedded in these interactions are social and economic practices which, in turn, mould and are moulded by power structures and relationships. Within this structuration, it may be possible to find both new objects of regulation and new forms of regulation which will be useful in the promotion of an objective such as sustainable development. In this sense realism may provide a new and useful understanding of why and how development tends to the unsustainable and how this might be changed.

2.4 **Realism and the promotion of sustainable development**

The principal utility of realist analysis to this thesis lies in the particular understanding of causality provided by the realist mode of explanation. This thesis aims to move beyond approaches to sustainable development which address the direct causes of unsustainable practices and events to identify and substantiate our understanding of deeper, more general and more focused, elements of causality. The multi-layered mode of explanation provided by realism posits a view of causality which encompasses both

structurally defined, tendentially expressed causal mechanisms and contingent factors. Simply put, this thesis is concerned to understand how it might be possible to regulate the tendency rather than the specific events which it tends to produce. Whilst fully accepting Sayer's (1984) arguments that it is ill-conceived to conflate 'structural' and 'macro' and that structural does not necessarily imply large scale and general, it may well be that some elements of causality are more or less general. Moreover, if these can be shown to be involved in the causation of unsustainable events, it would be logical and potentially more productive to seek to regulate these rather than the actual events which they predicate, whether these are soil erosion, forest depletion or any other kind of unsustainable outcome.

Crucially, the realist mode of explanation suggests that relevant mechanisms need to be 'activated' before they become significant causal factors. Understanding not just which mechanisms are involved, but also why and how these are selectively legitimated and activated is the key to understanding why present day modes of development tend to involve unsustainable outcomes. Understanding whether and how this biased process of activation might be objectively modified is of paramount importance to understanding how sustainable development might be effectively promoted. In the allegorical example of the river, it was suggested that the actual expression of tendencies might be regulated through modifications to the river system, for example by the construction of a weir, which effectively redistributes the free energy in the system. Similarly, if the structures and mechanisms which underpin unsustainable events and practices could be identified through a realist approach, it might then be possible to consider how these could be regulated in order that their expression might be modified. The realist mode of explanation suggests that the mechanisms which link objects and structures to actual events are variously empowered or rendered inconsequential. This selective process of 'activation' (which currently incorporates a particular bias) effectively determines the nature of the events which are actually realised. Understanding the processes of structuration through which particular mechanisms are legitimated and empowered is crucially important to understanding why development tends to the unsustainable. From this perspective, the institutional and social conditions within which causal mechanisms are expressed are highly significant because the structuration embodied in these conditions is a fundamental influence on the nature of development.

The next chapter of this thesis explores the ways in which insights from regulation theory might inform thinking in this area. According to regulation theory, modes of social regulation act in a manner closely analogous to that of the weir in the river. These institutions, structures and values represent the canalisation of history, socially constructed channels between the real and the actual through which the currents of development are regulated and within which the actuality of specific events is conditioned. By defining rights, constraints and powers which in turn influence the ways in which real causal mechanisms are expressed in practice they serve to license and to some extent direct the nature of development.

Chapter 3 **REGULATION THEORY**

This chapter begins by outlining the main tenets of regulation theory. Consideration is then given to the ways in which modes of social regulation influence patterns of development. In particular, it is suggested that current modes of social regulation selectively legitimate and empower strategies which sustain extant social formations by translating the contradictions which emerge within these into materially and morally significant forms of unsustainability. The final section of the chapter considers how such an understanding of the role of regulation in capitalist societies can inform thinking on sustainable development.

3.1 **A theory of regulation**

Capitalism as a non-equilibriating process

In chapter 2, it was argued that a realist methodology may well be appropriate and useful to thinking on sustainability. Regulation theory is itself founded in a realist ontology as Jessop explains:

> "The Marxian ontology implies that the real world is a world of contingently realised natural necessities. This world is triply complex: it is divided into different domains, each having its own causal powers and liabilities; these domains are involved in tangled hierarchies, with some domains emergent from others but reflecting back on them; and each domain is itself stratified. Comprising not only a level of real causal mechanisms and liabilities but also the levels on which such powers are actualized and/or can be empirically examined. For Marx the causal powers and liabilities in the domain of social relations were typically analysed in terms of tendencies and counter-tendencies which together constitute 'laws of motion'. These 'laws' operate as tendential causal mechanisms whose outcome depends on specific conditions as well as on the contingent interaction among tendencies and counter-tendencies; thus, in addition to *real* mechanisms, Marx also described their *actual* result in specific conjunctures and sometimes gave empirical indictors for these results" (Jessop, 1990:162).

Aglietta's original rationale for his project stemmed directly from the recognition that capitalism is not an equilibriating process (Aglietta, 1979:10). Thus, in so much as the logic of sustainability implies the need for some kind of equilibrium, insights from regulation theory may have considerable relevance to sustainability debates (Pierce, 1992; Drummond and Symes, 1996). Within this, a central concern with the ways in which contradiction and crisis emerge and are subsequently averted or at least postponed through modes of social regulation may well inform our thinking as to why and how unsustainable events come about and how they might be avoided.

Regulation theory has been developed, mainly but not exclusively in France, building on the work of Michael Aglietta. The understanding of capitalist development over broad time horizons has been the major objective of regulation theory to date. According to Aglietta:

> "Economists confronted with the transformations and crises of contemporary Western societies, and with the troubling future of the capitalist system as a whole, can find no foothold in general equilibrium theory. To take refuge in partial investigations, half empirical, half theoretical, only compounds the confusion. The way forward does not lie in an attempt to give a better reply to the theoretical questions raised by the orthodox theory, but rather in an ability to pose quite different questions. This means a collective effort to develop a theory of the regulation of capitalism which isolates the conditions, rhythms and forms of its social transformations .... The term 'regulation', whose concept it is the task of theory to construct, denotes the need for an analysis encompassing the economic system as a whole. This analysis should produce general laws that are socially determinate, precisely specifying the historical conditions of their validity" (Aglietta, 1979:15).

As Clarke explains:

> "For Aglietta the market is not an autonomous mechanism of the hidden hand, but a social institution, whose regulatory function cannot be presupposed. The operation of the market has to be conceived within the framework of a theory of regulation which establishes the possibility and limits of social and economic reproduction through an analysis of the complex web of historically specific and socially determined modes of regulation" (Clarke, 1988:62).

In particular, regulation theory has attempted to explain how capitalism could survive despite crises congenital to the logic of capital accumulation. As Moulaert and Swyngedouw put it the regulationist approach is concerned to theorize:

> "(1) the social and economic forms that channel the contradictions resulting from previous phases of sustained accumulation up to the moment that a major crisis arises, and (2) the development of new socio-economic forms that result from the crisis and the actions taken by (groups of) social agents. Embedded within this approach is the possibility of different forms of crisis: (a) short 'conjunctural' crises requiring minor adjustments (for instance, incremental technological changes, expanding spatial divisions of labour, and institutional adjustments); (b) structural crises (or crises of a particular mode of development) leading to qualitative changes in the organisation of the accumulation process; (c) crises resulting from fundamental contradictions in the capitalist mode of production itself" (Moulaert and Swyngedouw, 1989:329).

An important point here is that to date the unsustainable has generally been interpreted as some form of 'conjunctural crisis'. This may well have been inappropriate. It may well be that the unsustainable is often more properly and more usefully understood and addressed as outcomes which reflect the contradictions inherent in the second and third types of crisis outlined above.

By rejecting the notion that the conditions needed for the functioning and progression of capitalism are created in some miraculous way as structures reproduce themselves quasi-automatically, regulation theory cedes a certain, albeit limited, consequence to human agency. The suggestion is that conflict is regulated - avoided or at least postponed - through an ensemble of norms, institutions, organisational forms, social networks, and patterns of conduct - which sustain the conditions necessary for continued capital accumulation. Thus regulation theory replaces the notion of 'reproduction' with one of 'regulation'. Regulation is, however, inevitably imperfect and any regime of accumulation will always tend to be crisis prone and temporary.

3.2 **Key concepts**

Regime of accumulation

Although the contradictory nature of capitalist accumulation is such that it is inevitably crisis ridden and temporary, regulation theory suggests that particular 'accumulation systems' can be sustained through the medium term. A distinctive period of sustained accumulation is referred to as a 'regime of accumulation' which Boyer defines in these terms:

> "The ensemble of regularities that ensure a general and relatively coherent progression of the accumulation process. The coherent whole absorbs or temporarily delays the distortions and disequilibria born out of the accumulation process itself" (Boyer, 1990:461).

Jessop explains the concept in these terms:

> "An accumulation regime comprises a particular pattern of production and consumption considered in abstraction from the existence of national economies which can be reproduced over time despite its conflictual tendencies ..... relatively stable regimes of accumulation and national modes of growth involve a contingent, historically constituted, and societally reproduced correspondence between patterns of production and consumption" (Jessop, 1990:174).

Modes of social regulation

Within any regime of accumulation a particular accumulation system is necessarily supported by a mode of regulation through which individual agents and groups collectively adjust their decisions and actions to a pattern commensurate with the needs and constraints of the economy as a whole. According to Boyer, the term 'modes of regulation' designates:

> "Any set of procedures and individual and collective behaviours that serve to: reproduce fundamental social relations through the combination of historically determined institutional forms; support and steer the prevailing regime of accumulation; and ensure the compatibility over time of a set of decentralised decisions, without the economic actors themselves having to internalize the adjustment principles governing the overall system" (Boyer, 1990:42).

Jessop offers the following definition:

> "A mode of regulation refers to an institutional ensemble and complex of norms which can secure capitalist reproduction *pro tempore* despite the conflictual and antagonistic character of capitalist social relations" (Jessop, 1990:174).

In practice modes of social regulation necessarily encompass elements which range from concrete institutional structures (such as laws) to intangible determinants of social action (such as values and norms of behaviour). Peck and Tickell (1992:6) suggest that the analysis of modes of social regulation might be usefully formalised in terms of five levels of abstraction (see figure 3.1). Whilst it is crucial to recognise that elements of this typology possess neither potential nor meaning in isolation, unpacking the anatomy of modes of regulation in this way may still allow progress to be made in understanding both their constitution and their function.

Whilst the more concrete forms of regulation (essentially those towards the bottom of Peck and Tickell's typology) are almost by definition easier to identify and study, it is possible to argue that they can only be meaningfully understood and evaluated in conjunction with more abstract forms of regulation. Such a contention stands on several points. Firstly, concrete forms of regulation are only legitimised and it follows only ever truly effective if they are underpinned by accordant and complimentary social values. And perhaps even more significantly, less tangible forms of regulation can often be seen as higher order determinants of social action. 'Concrete' regulation, in the sense of legislation and the like, attempts to moderate patterns of behaviour which

Figure 3.1 **Modes of Social Regulation**

a] the mode of social regulation represents the concept in its most abstract form, as a generalised theoretical structure abstracted from the concrete conditions experienced in individual nation-states (for example, competitive regulation, monopoly regulation).

b] within each MSR, a certain set of regulatory functions must be dispensed in order for the accumulation system to be stabilized and reproduced (for example, the regulation of business relations, the formation of consumption norms).

c] the regulatory system is a more concrete and geographically specific manifestation of the abstract MSR, typically (although not necessarily) articulated at the level of the nation-state (for example, US Keynesianism, Pax Britannica).

d] regulatory functions are dispensed through the operation of regulatory mechanisms, specific to each regulation system, which are historically and geographically distinctive responses to the regulatory requirements of the accumulation system (for example, the mobilization of labour power, the codification of financial regulation).

e] regulatory forms represent those concrete institutional structures through which regulatory mechanisms are realized, although there need not be a straightforward one-to-one correspondence between mechanism and form (for example, local states, legislative systems).

Source: Peck & Tickell (1992)

are largely defined by these higher order modes of regulation, it follows that the most effective way to regulate development may be through strategies which attempt to influence the institutions, values and norms which are embedded in all societies.

The suggestion that sustainable development will be built around changed social values has been widely espoused. Consider for example, the Caring for the Earth report's prescriptions "to adopt the ethic for living sustainably, people must re-examine their values and alter their behaviour. Society must promote values that support the new ethic and discourage those that are incompatible with a sustainable way of life" (IUCN, UNEP, WWF, 1991:11); or as Redclift (1992:32) suggests, "the tortuous road to greater global responsibility is likely to be built on the daily lives of human subjects, and recognition that these lives involve choices of global proportions". However, as Murdoch (1992:7) points out "this shift in values will not take place simply at the level of the individual but will be the outcome of institutional practices .... we should see this as a social process". Certainly, validity of any particular instance of regulation is necessarily dependant on not only its own relevance to the mode of social regulation as a whole but also upon the validity of that whole. The point that the validity of any mode of social regulation lies in its

integrity is of considerable significance to consideration of how objective regulation might be articulated. For example, whilst it is tempting to suggest that the most appropriate locus for intervention lies in the 'higher order' moments of Peck and Tickell's codification, such a suggestion cannot be totally valid - these elements of regulation have no more substance when considered in isolation than do 'lower order' elements of the typology. Moreover, the validity of all elements of regulation is uncertain and insecure. Modes of social regulation come about and achieve validity through conflict and struggle rather than through objective promotion. And within this, particular regulatory mechanisms, and indeed modes of social regulation as a whole, are subject to constant change. Thus it might be argued that current sustainability debates represent part of a process through which a new, and more sustainable, mode of social regulation will evolve - but this hardly seems to be the case. Sustainability concerns remain peripheral because the validity of past and emergent modes of social regulation is defined by quite distinct criteria.

3.3 **Regulation theory and human agency**

Historically, regulation theorists have been centrally concerned with the social reproduction, for instance, of the wage relation, necessary for the creation and maintenance of a viable accumulation regime. Viewed in this way, the development of the Fordist mode of accumulation involved not only a transition to a pattern of mass production and mass consumption, but also the development of a set of social institutions necessary for this to occur and be maintained through time. For example, through the adoption of collective bargaining, a state adjusted minimum wage and a welfare state. According to Leborgne and Lipietz (1988:266), the emergence of these institutions was not the direct result of the capitalist dynamic *per se*, rather they reflected the ability of economic agents to internalize the logic of the regime of accumulation "by anticipating the success of their initiatives". However, for the most part, modes of regulation are not seen as being intentional and objectively constructed. Rather they result from an uncertain and ongoing process of struggle and conflict. As Aglietta explains, regulation theory:

> "Simply accepts that the class struggle produces, transforms and renews the social norms which make economic relationships intelligible. These relationships have conditions of validity which are narrowly limited by the persistence of the norms which give rise to them. At our present level of knowledge of the problems of social transformations, we can accept here that if the class struggle

> produces norms and laws which form the object of a theory of social regulation, it is itself beyond any 'law'. It can neither be assigned a limit, nor be confined by a determinism whose legitimacy could only be metaphysical. In a situation of historical crisis, all that a theory of regulation can do is note the conditions that make certain directions of evolution impossible, and detect the meaning of the actual transformations under way. Thereafter, however, the future remains open. Historical development is totally different from biological evolution in as much as it is governed neither by chance nor by a hereditary determinism. History is initiatory. But it is only possible to construct a theory of what is already initiated - which puts a decisive limit on the social sciences" (Aglietta, 1979:67).

Accordingly, we must accept that regulation theory prescribes a very circumscribed significance for human agency. That said, however, it does not totally preclude the potential for objective and efficacious strategy. As Jessop (1990:77) points out, "even at high levels of abstraction, the basic forms of the capital relation do not determine the course of capital accumulation. For the latter also depends on a variety of social practices, institutions, norms and so forth". Capitalism may have inviolable laws but it has a plurality of logics.

Regulation theory therefore suggests a particular relationship between economic structures and imperatives and social action. By rejecting the notion that the conditions needed for the functioning and progression of capitalism are created in some miraculous way as structures reproduce themselves quasi-automatically without effective social agency, social action is ceded a certain consequence by regulation theorists. Boyer puts it thus:

> "In stressing the structurally invariant features of the capitalist mode of production, one neglects to analyse the changes which mark it. One underestimates its contradictions, to the point where history appears almost immobile. In reality, it is a spiral, a process of innovation and of reproduction according to modalities that change from one period to the next" (Boyer, 1990:34).

Jessop comments on the situation in this way:

> "In principle, its advocates refuse to study regulation in terms of a structuralist model of reproduction or a voluntarist model of intentional action. The reproduction of capitalist societies is neither a fateful necessity nor a wilful contingency .... The structure/strategy dialectic does not separate struggle from structures but shows their complex forms of interaction. Structures are only prior to struggle in the sense that struggles always occur in specific conjunctures" (Jessop, 1990:194)

Clarke makes a similar point:

> "The proponents of the model and Lipietz in particular, vehemently deny that it is either voluntarist or functionalist. There is neither a subjective will nor an inevitable logic underlying the emergence of a

> new regime of accumulation. Thus the phase of disintegration is a phase of class and political struggles which may be long drawn out, involving a lot of trial and error, before by luck rather than judgement, a stable regime of accumulation emerges" (Clarke, 1988:68).

According to Jessop the related question of whether objects of regulation can pre-exist specific modes of regulation is a central issue. The various regulationist 'schools' which exist differ in their emphasis and hence in their conclusions on this point. Jessop (1990), however, suggests that the genesis of new modes of regulation is historically contingent rather than capitalistically preordained. For example whilst he argues that "capitalism cannot be understood without exploring the ramifications of the value-form", he is not, suggesting a structurally defined, deterministic progression. Rather he proposes, albeit implicitly, a role for properly conceived human agency as he continues:

> "The substantive unity and expanded reproduction of the capital relation depend on successful co-ordination of different moments within the limits of the value form .... In short, while the value form defines the basic parameters of capitalism, neither its nature nor its dynamic can be fully defined in value theoretical terms and further determinations must be introduced. But once one begins to explore how the value form acquires a measure of substantive unity, there are many ways in which this can occur. Moreover, since capitalism is underdetermined by the value form, each mode of regulation compatible with continued reproduction will impart its own distinctive structure and dynamic to the circuit of capital. This implies that there is no single unambiguous 'logic of capital' but, rather, a number of such logics" (Jessop, 1990:187).

In this sense, the capitalist dynamic is not strictly deterministic and a 'number of such logics' are conceivably valid. This permits the opportunity for more sustainable modes of regulation and there is no reason to suppose that different and more sustainable modes of development are not tenable. But is clear that these cannot be viable unless they embody the 'substantive unity' which Jessop describes. If this is to be achieved, the political economy of sustainable development has to be more deeply explored.

3.4 **The origin of the unsustainable and the object of regulation**

Contradiction and crisis

Historically the environment has been as marginalised in regulationist thinking as it has been in other strands of social theory. That said, close parallels exist between the concerns of regulation theory and issues which are

central to sustainability. Not the least of these is the fact that the contradictions which ecological unsustainability pose to the continued viability of economic regimes can be seen as being closely analogous to those other contradictory crisis inducing tendencies with which regulation theory has been concerned to date. Thus far, regulation theory has focused on crises which are endogenously derived, crises which are internal to the functioning of a capitalist economy; those which are the organic product of the system. Conversely, crises engendered by the constraints which the natural environment place on capitalist economies might appear to be exogenously derived. However, such a perception is superficial, if not erroneous. A broader conception of capitalist production would suggest that such exigencies may well be integral to the nature of capitalism. In reality, it may well be that a more rigorous and incisive analysis would suggest that the tendency to generate ecologically based crises is, in essence, very little different to any other propensity such as the widely studied tendencies to a falling rate of profit and to overaccumulation. As Smith puts it:

> "In its uncontrolled drive for universality, capitalism creates new barriers to its own future. It creates scarcity of needed resources, impoverishes the quality of those resources not yet devoured, breeds new diseases, develops a nuclear technology that threatens the future of all humanity, pollutes the entire environment that we must all consume in order to reproduce, and in the daily work process it threatened the very existence of those who produce the vital social wealth" (Smith, 1984:59).

There are, however, ways in which ecological barriers to capitalist production might differ from the types of crisis with which most regulationist analysis has traditionally been concerned. For example, however traumatic and disruptive crises in the accumulation process of the latter kind may be, ecological crises may prove to be much more fundamental and even more traumatic. Some ecological crises are potentially so basic that it would not be sufficient to merely postpone them as one might postpone the need to devalue fixed capital. Whilst the transition from one relatively stable period of accumulation to another (for example, from fordism to post-fordism), may be disruptive, the failure of the former does not in itself preclude the formation of the latter, whereas this may be the case with some types of ecologically derived crises. In this sense then, the types of crisis with which sustainable development is concerned are sometimes quite radically different from the medium term avoidance of crisis which has characterised regulationist thinking. Although there may well be, as Moulaert and Swyngedouw (1989) point out, a spatial element within this, a transition from one regime of accumulation to another

essentially involves a reconfiguration of the internal structures of the system rather than the redefinition of the limits of that system. At least, such a reconfiguration is sufficient for the transition to take place.

Exigency, expediency and expendability

Regulation theory is founded on the premise that capitalist socio-economic formations tend to be crisis prone and inherently unsustainable. Particular capitals and the patterns of social relations associated with these tend to become less and less viable through time. However, particular socio-economic formations can be, and are, more or less purposively sustained in the medium term despite the crisis prone nature of the capitalist mode of production. In order to sustain such formations, the contradictions and crises which threaten them are addressed through strategies which seek to maintain the viability of the status quo. These strategies are selectively legitimated and empowered by the 'mode of social regulation'.

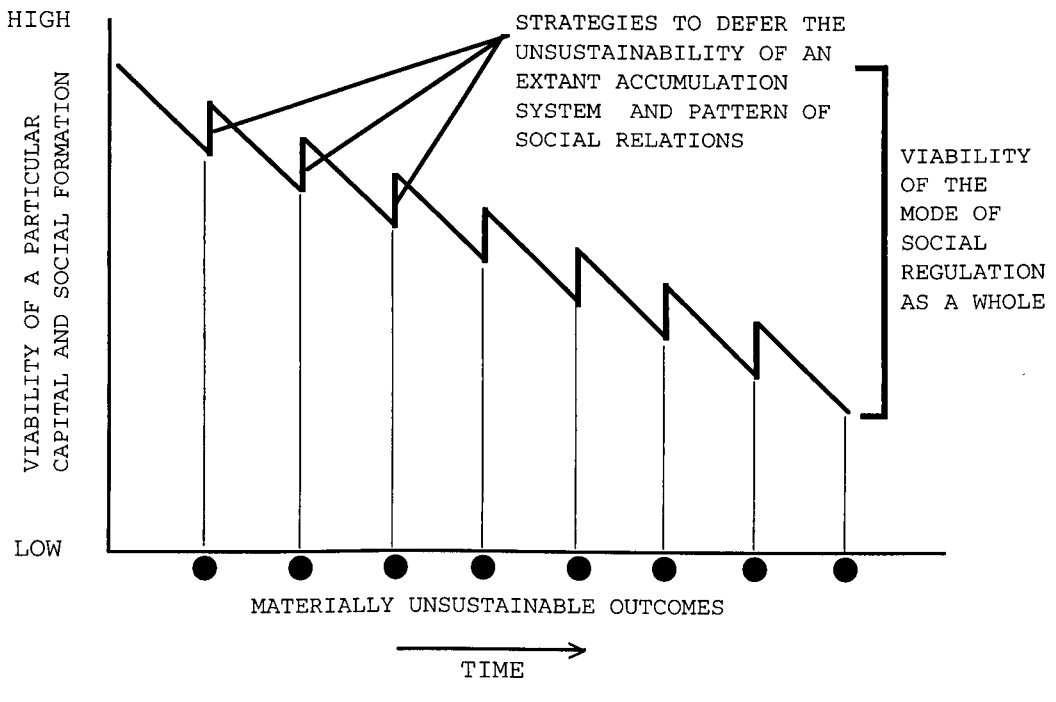
Modes of social regulation encompass institutions, structures and values which act as channels between the real and the actual through which the dynamism of capitalist development is regulated and within which the nature of specific events is conditioned. They define rights, constraints, opportunities and powers which in turn influence the ways in which real causal mechanisms are expressed in practice. They serve to license and to some extent direct the nature of development.

In capitalist societies, 'regulation' has been centrally concerned to maintain and control the value of capital and fixed assets, and it follows, with preserving and reproducing the existing power structures within society. This very process has predicated the unsustainable as strategies promoted to address internally generated contradictions have necessarily involved increasingly exploitative practices and the implicit redefinition of resources in ways which denies their true social value and perpetuity.

Figure 3.2 shows how the inherent unsustainability of social formations tends to be translated into a range of materially and morally unsustainable events and practices. As much of the twentieth century testifies, the inherent unsustainability of socio-economic formations can be postponed, but in practice only through measures which tend to involve other forms of unsustainability. A useful conceptual distinction arises here between what might be termed *relational sustainability* and *material sustainability*. The

former is both the overriding object of regulation in capitalist societies and the condition which ensures the viability of a particular mode of social regulation. The latter encompasses the material and moral objectives of sustainable development. What tends to occur in practice is that something which in itself is essentially inconsequential - *relational unsustainability* - is postponed, but only through processes which involve other more significant forms of *material unsustainability*. This process of translation is fundamentally conditioned by the nature of the mode of social regulation because it is this which selectively enables and empowers the mechanisms involved. This process of selection is biased. As they are currently constituted, modes of social regulation condition development in ways which make unsustainability the norm.

Fig. 3.2. **The Mode of Social Regulation and unsustainable outcomes**



As the viability of a particular socio-economic formation (i.e. a particular capitalist enterprise such as plantation based sugar production in the Caribbean) becomes threatened, strategies designed to preserve the value of capital and the viability of extant patterns of social relations are devised and promoted. Contradictions which emerge in a particular place at a particular time are deferred, for example through the provision of credit, or exported, for example through the exploitation of new resources and markets. Which strategies are actually 'successful' is determined by the mode of social

regulation which selectively legitimates and empowers some strategies whilst invalidating others. However, the effectiveness of even 'successful' strategies can only ever be temporary as new and more profound contradictions will always tend to emerge. Thus it follows that subsequent strategies will necessarily involve ever more extreme forms of exploitation. The key point here is that however sustainability is defined, 'successful' strategies will inevitably tend to involve unsustainable forms of exploitation. Wherever the line is drawn, development will always cross it. While the mode of social regulation as a whole remains viable, new and more profound contradictions will always tend to emerge. And because these contradictions are more profound, effective responses will similarly need to become more and more exploitative. Measures which sustain particular capitalist formations in this way will always tend to produce outcomes that are unsustainable because they necessarily involve the progressively severe exploitation of both natural capital and of some groups or members of society. In effect, sooner or later, the line between sustainability and unsustainability will be crossed. And it will continue to be crossed so long as the mode of social regulation as a whole remains viable.

The overriding factor governing the validity of the mode of social regulation as a whole - *the* object regulation - is the effectiveness with which this whole can sustain the value of capital in the face of contradictory tendencies. A mode of social regulation exists in order to ensure the conditions needed for capital accumulation and because it is temporarily successful in achieving this. Given the centrality of this object of regulation, it becomes inevitable that modes of social regulation will tend to legitimate practices which produce materially and morally unsustainable outcomes. Notwithstanding expedients, such as the provision of credit and the application of new technologies, etc., regulation is always likely to involve an incidental devaluation of both natural resources and the lives of many members of society. It is usually a matter of where and when this occurs. Particular instances of regulation may, temporarily, postpone the expression of economic dysfunction and crisis, (as for instance in the post-war Keynesian experiment), but in doing so they tend to fundamentally undermine the social and ecological fabric of sustainability.

Whilst particular elements of regulation or forms may avert particular crises, they tend to only redirect rather than counteract the tendencies which give rise to these events. An instance of regulation which is effective in that it serves to sustain a particular formation will almost inevitably transfer the problem to a different location or change the form of its expression. The more successful regulation is in perpetuating a particular accumulation system

through time, the more extreme and more exploitative and potentially damaging the accumulation process is going to become. Without regulation the accumulation process cannot function, but inevitably there comes a point where continued accumulation can only be maintained through systems of exploitation which are by their nature unsustainable. Increasingly therefore, accumulation requires modes of social regulation which justify and legitimate material unsustainability. For example, the provision of credit at a variety of scales may well defer a crisis of over accumulation. But, as with other elements of regulation, this type of strategy is merely an imperfect and temporary expedient rather than the basis of a truly sustainable system. Consider, for example, the ways in which high levels of international debt have tended to produce a whole range of unsustainable outcomes in the South. The logic of this is that past and existing forms of regulation have managed to operate on assumptions of unsustainability, if not in the same place then in others. Capitalist accumulation and sustainable development have been and remain dialectically related. The overriding object of regulation exists in capitalist societies as the antithesis of the material and moral basis of sustainable development. However, thus far analysis of capitalist development has not sufficiently incorporated the progressive devaluation of nature through the reconstruction of regressive modes of social regulation, and debates about sustainable development have progressed as if these interconnections and dialectics are inconsequential for the concept and its reality.

3.5 **The regulation of sustainable development**

A move towards sustainable development requires a reconstitution of the regulatory mode in ways which change this central object of regulation. As they are currently constituted modes of social regulation prioritise the value of capital and existing class structures while incidentally marginalising the material basis of sustainability. By defining the object of regulation in this way society legitimates and empowers a set of causal mechanisms which sustain wealth and privilege at the expense of a whole range of materially and morally unsustainable outcomes. This need not be the case, but purposive change depends on a more developed understanding the mechanisms and conditions which create and reproduce this situation than currently exists.

There is no single uniquely deterministic logic of capital which defines the object of regulation in this way. We should remember that modes of social

regulation are just that - social. They are socially produced and reproduced. They can be changed. That said, it is important to recognise that they are all-embracing and almost infinitely complex. And, crucially, that they come about and achieve validity through a process of experimentation, conflict and struggle rather than through any form of objective promotion. Society cannot simply construct new modes of social regulation as valid wholes. But what is being suggested here is not that modes of social regulation can be objectively constructed *per se*. Rather that the core values and institutions which legitimate and empower the mechanisms which underpin unsustainable outcomes can be changed. A key problem here is that any strategy to redefine the object of regulation in this way is necessarily radical in that it challenges the existing social order. Accordingly, the fact that regulation is normally realised through existing power structures appears to represent a major barrier to the promotion any such agenda. This aside, it seems clear that sustainability can only be built around institutional and value shifts in society, and moreover that it is not simply the values which society places in environmental resources and human lives which are important. Equally if not more significant are the values and institutions which prioritize the value of capital and the maintenance of existing patterns of social relations. These core values can be changed. However, if new modes of social regulation are to emerge, if viable accumulation systems are to incorporate natural resources in new ways, the stimulus for this needs to emerge from progressive breakdowns of struggles dynamically experienced within the mode of social regulation. And within this analysis, it is crucial that unsustainable practices are understood and addressed as outcomes rather than as events *per se*.

Strategy must be formulated within a conception of sustainability which recognises the transformational nature of capitalism. Historically, and today, the object of regulation and the viability of any regulatory mechanism are dependent on their relevance to the existing accumulation process. From this perspective, if key elements of sustainability are to transcend particular regimes of accumulation, there can be little utility in merely sustaining the value of capital *per se*. Such strategies are inevitably tactical and ultimately untenable exercises in extemporisation. But more than this, they ultimately promote the destructive over-exploitation of both nature and labour. The achievement of sustainable development requires that the object and nature of regulation are extended to incorporate environmental and moral criteria. Sustainability needs to be articulated in the reflexive progression of capitalism

and the social systems which sustain and renew the dynamism of capitalist accumulation.

A central tenet of the regulationist perspective is that the social, institutional and economic regularities which constitute any particular regime of accumulation are 'unsustainable' in the sense that they are inevitably temporary. The collapse of any particular regime of accumulation will necessarily tend to occur because of internally generated contradictions which progressively engender incongruence and disequilibrium. In itself this is not a problem. A new set of regularities, a new quasi-stable form can emerge phoenix-like from the ashes of the old. Indeed the old must go before the new can emerge. But here, surely, lies at least part of the explanation of why the unsustainable occurs. The emergence of a new regime of accumulation necessarily involves the devalorisation of the old. The problem here is that whilst the devalorisation of the pattern of relationships existing in the old would be sufficient to allow the new to emerge, these are only devalued when regulation has failed. In practice, what tends to occur is that disequilibria which emerge in established socio-economic formations are ameliorated through increasingly severe processes of exploitation involving expropriation and devalorisation of resources both within and outside the system itself. In this way the inviability of structures internal to the capitalist system itself, for example particular class structures, are translated into true unsustainability. The internal contradictions of the capitalist system become, through regulation, externalised in ways which produce material and moral forms of unsustainability.

The achievement of sustainability requires that the internally derived disequilibriating tendencies of capitalist systems remain internal. If this is to be achieved it will necessarily involve the construction of new and different modes of social regulation. If these are to be promoted a crucial significance attaches to understanding how the essentially internal is translated into the external, and within this, how this process is validated and empowered through particular regulatory processes and modes of social regulation. If this can be achieved, it may then be possible to devise and put in place new modes of regulation which do not, by virtue of what they are, inevitably promote the unsustainable. As they are currently constituted, modes of social regulation condition development to the unsustainable. This conditioning is what needs to be moderated if sustainable development is to be achieved. It may not be possible to 'manage' development, but that is not to say that it cannot be regulated in new and different ways.

Chapter 4 REALIST METHODOLOGY AND SUSTAINABLE DEVELOPMENT

This chapter outlines the methodology used to construct a realist explanation of unsustainable patterns of development in and around the Barbadian and Australian cane sugar industries. The first section of the chapter outlines the relevance of a realist approach to sustainability debates. Consideration is then given first to the general methodological considerations posed by a realist approach and subsequently to the specific research methods used in this project. Although it is recognised that established realist methodology is often somewhat idealised and difficult to apply in practice, it is argued that the difficulties this produces are not insurmountable.

4.1 Realism and sustainable development

As the impossibility of managing sustainable development has become increasingly apparent, a degree of consensus has emerged concerning the need to move away from a focus on eventual outcomes to consideration of why and how these are produced and reproduced by underlying social processes and conditions (Benton, 1994; Jacobs, 1994; Dickens, 1992). From this perspective, the way ahead does not lie in finding more 'objective' methods of defining what is or is not sustainable in any particular case. Rather, the need is to better understand why overly exploitative and degrading practices come about and how they are able to achieve a large degree of social and political legitimacy. This requires that a conceptual framework and methodology for articulating sustainable development is developed through a closer engagement with social theory. Within this, it is particularly important that research explores the ways and potentialities of present systems of economic and social regulation assessing how institutional and value change at the social and economic level might be effectively promoted. Insights from critical realism and a regulationist perspective on the nature and dynamics of capitalist economies may thus play a major role in defining a more productive approach to progressing both the theory and practice of sustainable development.

Realism provides an ontological and epistemological basis for understanding the causality of unsustainable practices and events. Regulation theory is potentially useful in that it can begin to clarify our ideas as to what can and cannot be sustained. Crucially, it suggests why some unsustainable events and practices come about as disequilibria generated from within the capitalist accumulation system are translated into the materially and morally unsustainable events as internally generated tensions are exported beyond the

system itself. Although a regulationist perspective posits a highly circumscribed potential for human agency (Jessop, 1990; Jessop, 1995), it can also suggest how we might seek to condition a more sustainable future through the construction of new and different modes of social regulation. Understanding the role of modes of social regulation and the conditions which ensure their validity may thus be important in understanding how sustainable development might be promoted. If such 'reconditioning' is to be attempted, the first step is to understand sustainable development as a condition rather than a criterion through which development can be evaluated and managed. Certainly the unsustainability which pervades present day modes of development is constituted in specific practices and events, but these events are predicated by structural elements of causation and the conditions through which the tendencies which these give rise to are mediated. A key point here is that the outcomes produced are not 'determined' by these structures and conditions; rather these factors mean that particular types of outcome are always likely to be realised.

Historically, 'regulation' has been centrally concerned to maintain the value of capital and to preserve extant patterns of social relations in the face of contradictory tendencies. Thus 'regulation' has tended to legitimate and actualise increasingly profound forms of exploitation, and sooner or later this exploitation tends to cross the line into unsustainability. The achievement of sustainable development requires that the criteria which define the validity of modes of social regulation are themselves expanded. If this expansion is to be promoted, an understanding of what must be regulated and how and at what level this might best be achieved becomes crucial. If viable accumulation systems are to incorporate natural resources in new ways, the stimulus for this needs to emerge from progressive breakdowns of struggles dynamically experienced within the mode of social regulation. Accordingly, this project was concerned to explore the ways in which the subjectively formulated strategies of actors within two industries interacted with the structural dynamics of capitalist accumulation in a process of experimentation and struggle; and to test the contention that the outcomes of these struggles are biased in ways which condition development to the unsustainable.

Whilst established realist methodology places considerable emphasis on the 'unpacking' of events in order that causal mechanisms can be identified and evaluated, this research was equally concerned to understand how particular modes of social regulation selectively legitimate and 'activate' these

mechanisms. The challenge for the project was to situate and interpret 'concrete' instances of unsustainability within a model embodying the multi-layered mode of explanation defined by a realist ontology.

4.2 **Realist Methodology**

Although it is possible to make a convincing case for a realist approach to understanding sustainability issues in terms of its potential utility and theoretical legitimacy, the application of such an approach is less than straightforward in practice. As Pratt points out;

> "On reflection it can be noted that the appropriation of critical realism by geographers has been at best partial. For a perspective that stresses the integral importance of empirical work it is a supreme irony that the complementary, practical, element is almost totally underdeveloped" (Pratt, 1995:67).

In many ways it is the very nature of the realist mode of explanation which makes realist research difficult to conduct in practice:

> "In explaining any particular phenomenon, we must not only make reference to those events which initiate the process of change: we must also give a description of that process itself. To do this, we need knowledge of the underlying mechanisms and structures that are present, and of the manner in which they generate or produce the phenomenon we are trying to explain. In describing these mechanisms and structures we will often, in effect, be characterising the 'nature', 'essence', or 'inner constitution' of various types of entity." (Keat and Urry. 1982:30).

The ontological basis of realism provides a multi-layered but unified mode of explanation and the task for realist researchers is to embrace, in a single moment, the full extent of the realist view. In practice, the problem becomes one of approaching research in ways which are necessarily partial but which still respect the unity of the realist mode of explanation:

> "To be practically-adequate, knowledge must grasp the differentiations of the world; we need a way of individuating objects, their attributes and relationships. To be adequate for a specific purpose it must abstract from specific conditions, excluding those which have no significant effect in order to focus on those which do. Even where we are interested in wholes we must select and abstract their constituents" (Sayer, 1984:80).

According to Cloke *et al.* (1991:148) "the practice of realism involves two basic requirements: (1) theoretical categories, so as to 'get at' necessary relations;

and (2) empirical study, so as to 'get at' contingent relations". Sayer advocates a process of 'synthesis' which he explains in these terms:

> "Abstract theoretical research deals with the constitution and possible ways of acting of social objects and actual events are only dealt with as possible outcomes. Examples include theories of value in economics and those theories of social class which define class in terms of internal relations. Concrete research studies actual events and objects as 'unities of diverse determinations', each of which have been isolated and examined through abstract research. By contrast, the method of generalisation tends not to involve abstraction, at least not self-consciously and treats objects as simple rather than concrete. Its main purpose is to seek regularities and common properties at this level. We might also add a fourth type - 'synthesis'; that is, research which attempts to explain major parts of whole systems by combining abstract and concrete research findings with generalisations covering a wide range of constitutive structures, mechanisms and events" (Sayer, 1984:215).

Outhwaite (1987:58) advocates an approach to critical realist research which focuses on the postulation of possible causal mechanisms the validity and significance of which can then be analysed; first by collecting evidence for their existence and subsequently by eliminating possible alternatives. An important point here is the particular meaning ceded to the idea of a mechanism in realist thinking:

> "In asking about the structure generating some power of some entity, we are asking about a 'mechanism' generating an 'event'. A mechanism in this sense is not necessarily mechanical in the sense of Newtonian mechanics. It could be an animal instinct, an economic tendency, a syntactic structure, a Freudian 'defence mechanism'" (Collier, 1994:43).

A major difficulty here lies in the fact that it is not obvious how one might progress directly from empirical observations of concrete events to the identification and analysis of key causal mechanisms in the domain of the real. In the meander case considered in chapter 2, field observations may well establish rates of erosion and deposition, but it is not possible to move directly from these observations to an understanding of causality based on the laws of thermodynamics. Such laws cannot be inferred directly from observation of concrete events occurring on a particular stretch of river. There is then a major ontological and theoretical problem of transgression. A realist methodology confronts this problem directly by suggesting that when 'real objects' are unobservable, they can still be identified through a process of abstraction in which the 'necessary' or 'internal' relations between objects are analysed. Such relationships are usually explained by the analogy of a tenant - for there to be a housing tenant there must be a landlord, and it follows that

if there is a landlord property rights must exist, and so on (Allen, 1983). Pratt (1995) uses the term 'retroduction' to describe the process through which causal mechanisms are identified, corroborated and subsequently substantiated.

Sayer explains the significance of this type of relationship more fully:

> "In making abstractions it is helpful to distinguish between relations of different types. The term 'relation' is a very flexible one but there are some significant contrasts implicit in its various uses. A simple distinction can be made between *'substantial'* relations of connection and interaction and *'formal'* relations of similarity or dissimilarity .... Clearly things which are connected need not be similar and vice versa .... Another useful distinction can be made between *external*, or *contingent relations* and *internal* or *necessary relations*. The relation between yourself and a lump of earth is external in the sense that either object can exist without the other. It is neither necessary nor impossible that they stand in any particular relation; in other words it is contingent .... By contrast, the relation between a master and slave is internal or necessary, in that what the object is is dependent on its relation to the other; a person cannot be a slave without a master and vice versa. Another example of the relation is the relation of a landlord and a tenant; the existence of one necessarily presupposes the existence of the other" (Sayer, 1984:88).

In practice most actual conjunctures are more complex and less straightforward than the idealised exemplars often used to demonstrate realist methodology would suggest. Moreover, the problem is not simply one of sifting out spurious contingent factors. Plural and possibly counteractive mechanisms may well be involved. In practice, this means that once mechanisms and hence structures have been tentatively identified, their nature and relevance have to be verified and substantiated through a reflexive exploration of their characteristics and properties and their correspondence with both abstract notions of structural properties and actual events. Thus a key element of the realist methodology, and in practice one which differentiates it from positivist methods, is the emphasis it places on moving iteratively to a more substantial and convincing model through a process of conceptualisation and reconceptualisation in which the researcher's understanding of the constitution and significance of mechanisms is progressively revised. As Pratt (1995:67) explains:

> "The process may not be a direct or linear one, often it is an iterative one, the model being refined in an ongoing process. Whilst this may seem a trivial point it does severely challenge existing modes of scientific endeavour, both implying a far more exploratory structure and a challenge to the common form of presentation of results. .... the process of conceptualisation and reconceptualisation is central throughout the whole endeavour".

Moreover, it is highly unlikely that significant aspects of causation, be they structural or contingent, can be isolated from the unpacking of any single event. At best, in such a case it is only possible to suggest that several elements are present and that one or more of them may be significant. Exactly this question of selectivity has been a major problem in the study and practice of sustainable development. That is, how does one arrive at an effective prioritisation of key mechanisms at different levels of power and influence in order to progress towards a more sustainable end? In practice, if we wish to isolate significant elements of causation it is probably necessary to analyse a range of related events. Whilst such a methodology is vulnerable to the problem of the method of difference, that is to say what is common may not be causally relevant and vice versa and thus cannot be totally conclusive, it may prove sufficient in this context.

A further problem here is that the process of retroduction, or at least the way in which it is practised, is always likely to be influenced by pre-existing notions concerning the nature and significance of the structures being considered. For example, if capitalism is pre-emptively understood to involve tendencies to disequilibrium and crisis (as in regulation theory), the research is always likely to find evidence to corroborate mechanisms which would reflect this interpretation within the reflexive process of substantiation and refinement. Thus, in practice, analysis may well still reflect the bias of the researcher. Ideally, however, properly conducted realist research should inform both the theoretical categories involved in the process of abstraction as well as explanations of why particular events come about.

An additional complication for the realist researcher lies in the fact that events are not seen as simply reflecting conjunctures between mechanisms and contingent factors. The ways in which mechanisms are selectively 'activated' by the conditions in which they occur is also crucially significant. As Lovering (1990:32) points out, connections in any specific historical instance are not only likely to be complicated, they must also be understood theoretically as 'mediated effects'. For example, it can be argued that in capitalist societies, the logic of capitalist dynamics is mediated through particular and different modes of social regulation. Thus actual events are richer, more diverse and less strictly determined than any purely fundamentalist conception could allow. Because of this, the processes through which significant causal mechanisms are identified and substantiated cannot simply evaluate the correspondence of mechanisms to the perceived structural properties and

actual events. The evaluation must relate to the particular context in which a mechanism occurs. Certainly, this context is held to be highly significant in this thesis - not least because as Sayer explains:

> " .... it should be noted that critical theory does not simply *replace* research on what *is* with criticism of what is, plus assessments of what *might be* from the point of view of emancipation. It would be a poor critical social science which imagined that it could dispense with abstract and concrete knowledge of what is in society. If certain mechanisms are to be overridden or undermined and new ones established we need abstract knowledge of the structures of social relations and material conditions by virtue of which the mechanisms exist ..... we can also see that it would be poor abstract or concrete research which was unaware of the fact that what *is* need not necessarily be, and which failed to note that people have powers which remain unactivated in the society in question but which *could be* activated" (Sayer, 1984:256).

4.3 **Realist research techniques**

The question of precisely which research techniques are most appropriate to a critical realist research agenda has been a matter of some debate (Sayer, 1984; Fielding and Fielding, 1986; Dale *et al.*, 1988; Burrows, 1989), and as Pratt (1995:67) suggests the methodology for 'putting critical realism to work' remains, "a rather vague 'recipe book". The central question which realist researchers need to consider is, as Pratt (1995:67) suggests, "What, in practice, is so different about research informed by critical realism?" When this question is asked, it soon becomes clear enough that the nature of the realist mode of explanation means that techniques considered to be appropriate within alternative epistemologies are often inadequate for realist analysis. For example, methods which seek to establish and verify, for example through empirical invariance, a direct causal relationship between factor x and event y are inappropriate because they assume that the cause of y can be adequately explained in terms of x (Bhaskar, 1994:19). Similarly, an understanding of the intuitively determined properties of particular structures may form a key element of any realist analysis, but this alone cannot provide an adequate explanation of events within this perspective. For example, "In the world according to [Marxist] 'fundamentalism', the fact that the economy is *capitalist* is of overriding significance .... the task of analysis is to draw out the connections between observable development and the underlying dynamics of capitalist class relations" (Lovering, 1990:32), but this is discordant with a realist approach because it posits a direct and ultimately deterministic and teleological mode of explanation. Such logic may be valid, but it is again partial. The problem is not so much that these techniques are incompatible

with a realist mode of enquiry. Rather they are insufficient to produce the holistic explanation essential to realist analysis.

Realist research does not reject research techniques used in other epistemologies, rather it seeks to place them within a broader model. Pratt (1995:68) writes of attempts to 'link' or 'combine' different approaches. However, it is clear that realist methodology is necessarily more than an eclectic combination of techniques. For example, it is not concerned to validate results through finding empirical invariance. Rather the realist researcher is concerned to establish, albeit through an iterative process of repeated reconceptualisation, a convincing and 'practically adequate' model which captures, unifies and elucidates the realist mode of explanation (Pratt, 1995:66; Sayer, 1984:66).

The objective of realist research is to uncover significant causal powers, and this objective prescribes the use of investigation techniques which are less structured than would be the case within positivist epistemologies. The type of information required for a realist analysis is best achieved through informal techniques which maximise information flows by allowing respondents to highlight the significance of their own powers through their own, albeit subjective, interpretations of causal processes. The logic of this is that realist research in the social sciences should utilise unstructured interviews and open questions. In practice this often means adopting a flexible approach which responds to the direction and emphasis provided by the respondents (Pratt, 1995:69). For similar reasons, the realist researcher is concerned to identify and investigate, not a representative sample of the population, but rather those agents with significant causal powers (to identify the inherent properties of the objects involved and the ways in which these properties relate to each other to produce particular outcomes). Accordingly, the individuals upon which the research focuses:

> ".... need not be typical and they may be selected one by one as the research proceeds and as an understanding of the membership of a *causal* group is built up" (Sayer, 1984:221, emphasis in original).

4.4 **A realist exploration of unsustainability**

The subsequent chapters of this thesis revolve around the application of the research agenda and methodology outlined above. The research undertaken focussed on two case studies of sugar cane production: one in Barbados and the other in the Australian State of Queensland. The sugar sector was selected

for two principal reasons. First, it embraces many of the environmental, economic, social and moral concerns which are widely held to be significant to sustainable development. Second, the nature of the global sugar economy, and the relatively long period through which sugar has been produced in the case study locations, provided the potential for a productive analysis of the relationship between the dynamics of capitalist accumulation and sustainability concerns (see chapter 5).

The choice of Barbados and Australia as particular case studies within the sugar sector was based on a number of factors. Given the nature of the realist research process outlined earlier in this chapter, it was anticipated that a comparative study of this type would be useful in that it would facilitate the identification of significant elements of causality within situations made complex and unclear by contingent factors. There are broad areas of commonality between these two case studies, not the least of which being that both locations produce an essentially identical commodity - sugar. There are, however, also significant differences between the sugar industries in the two study areas. Australia is a highly developed country whereas Barbados, whilst it hardly has the problems of some developing countries, remains part of the 'South'. The Barbadian sugar industry, which has existed for over three hundred years, is now on the verge of total collapse whereas the Australian sugar industry is often held to be a paragon of efficiency, innovation and, implicitly at least, of 'sustainability'. Another key difference lies in the fact that Barbados sugar production has remained plantation based, whereas in Queensland production has been based on family farms for almost one hundred years. Over and above these differences, the ways in which the sugar industries in these two locations are regulated are also very different. This is true not only of the more concrete forms of regulation which exist in these two locations, but also with respect to the less tangible elements of their respective modes of social regulation.

Realist methodology requires that a model informed by both actual events and theoretical constructs is progressively constructed, substantiated and improved. The question of where the researcher 'breaks into' this model in order to begin the process of conceptualisation and reconceptualisation is not particularly significant from a methodological perspective. In practice, this research initially evolved around key theoretical categories derived from regulation theory and a preliminary analysis of the nature and history of the global sugar economy. The history of the two case study industries was also

explored at this stage using data from a range of secondary and primary sources including official publications, academic texts and the records of industry bodies. In so much as the model being tested and refined should be progressed in ways which inform the original conceptual constructs, this methodology was not discordant with established definitions of what is appropriate in realist research. Somewhat more problematic, however, were the criteria used to define 'unsustainable' events which formed the other domain of the model being tested.

The central tenet of this thesis is that attempts to objectively define what precisely constitutes sustainable development in any particular place and time are ill-conceived. However, in so much as the model being tested and refined in this research required 'concrete' instances of unsustainability, two basic definitions were used. First, much literature addressing the two case studies (for example, Caribbean Conservation Association *et al.*, 1994; and Department of Primary Industries, 1994) defined sustainable development in their own terms. Similarly, many of the individuals interviewed during the research also had their own interpretations of the concept. Second, it was assumed that the externalisation of contradiction and dysfunction emerging within any particular production system constituted a form of unsustainability (see chapter 1). Thus for example, water extraction from an aquifer which exceeded the rate of replenishment, or farming practices which involve highly polluted runoff were held to be 'unsustainable' for the purposes of this research. These criteria may be inexact and contestable, but they were appropriate and sufficient. The fundamental point is that, in themselves, the events which were actually used as examples of unsustainability in the research and subsequent analysis have little significance to this thesis. They may or may not constitute examples of unsustainability, but this is in no way consequential. To have sought any 'objective' definition would have been fruitless. The whole aim of this thesis is to surpass the sterility of such 'objectivity'.

The main empirical component of this research revolved around a series of interviews conducted in Barbados and Australia. A particular problem with research which attempts to construct a model of causality through interviews with individuals is that their interpretations of causality are individually and collectively subjective. Certainly, regulation theory posits a very circumscribed potential to human agency; and it has been argued that it can provide little more than a context within which development can be interpreted:

> "At best we have more or less plausible regulationist conceptualizations of these shifts. Yet, however detailed the analysis of the strategic context might be, it cannot itself generate an adequate explanation for strategic action. This would require in addition at least some account of the strategic capacities of actors (individual or collective) to respond to economic problems, the strategies they pursue and the relationship between these capacities and the strategies and those of other relevant actors in that context" (Jessop 1995:321).

From a regulationist perspective, actors may anticipate the success of particular initiatives (Leborgne and Lipietz, 1988:266), but their consequence within the processes of struggle which constitute the actuality of development cannot be ensured. Actors within and around the Barbadian and Australian sugar sectors are clearly significant in that their actions serve to reproduce and sometimes transform existing structures. However, their strategies are necessarily formulated within bounded rationalites and influenced by the conditions in which they are articulated, and in practice the reproduction and transformations which have occurred have often been less than intentional.

> "Structures are seen as durable, sometimes capable of causing social change or social conditions, and also capable of locking their occupants into role positions. They are often difficult to displace and transform, yet are continually reproduced by the actions of people, who in turn are often not reproducing structures in any way intentionally (Cloke *et al.*, 1991:150).

As Bhaskar suggests:

> "People do not marry to reproduce the nuclear family or work to reproduce the capitalist economy. Yet it is nevertheless the unintended consequence (and inexorable result) of, as it is also a necessary condition for, their activity (Bhaskar, 1979:44).

In terms of this research, the unquestioning faith in modernisation which pervades the Australian sugar farming sector is often just that - unquestioning, but it is still potentially causally significant. This does not mean that actors should be regarded as 'cultural dupes, programmed to perform roles and reproduce structures' (Cloke *et al.*, 1991:150). Rather, the rationality and significance of strategy needs to be interpreted *in context.* From a realist perspective, it is also important to recognise that individuals have causal powers and liabilities in much the same way as inanimate objects and that these are activated by contingent factors (Sayer, 1985). Sayer's interpretation on the implications of this are summarised by Barnes:

> "Sayer makes three further claims: (1) that unlike inanimate objects, individuals have the ability to learn and thus the power to change their causal powers and liabilities over time; (2) that while such change is possible, the intersubjective beliefs that constitute

> subjectivity are relatively stable and are reproduced through a recursive relationship between the individual agent and the broader social structure; and (3) that in order to understand the subjectivity of agents and hence the causes of their action, it is necessary for the researcher to engage in some form of interpretative understanding, or *verstehen*" (Barnes, 1996:20).

Questions of rationality and subjectivity are important to thinking on sustainability. Thus far, most approaches to sustainable development have assumed that sustainability goals can be rationally promoted through specific initiatives. This has proved to be an overly ambitious assumption. This thesis is an attempt to consider how sustainable development might be promoted despite the limited rationality and scope of human agency. Thus although as Jessop (1995) suggests it may well be the case that 'detailed analysis of the strategic context' cannot itself generate an 'adequate explanation for strategic action', a realist epistemology allows us to address this problem by considering more fully the significance of the context itself.

4.5 **Derived research methods**

The critical realist mode of explanation places considerable significance on the context in which development occurs, and a key objective of this project was to consider the ways in which particular conditions effect the outcomes produced. The research was concerned to elucidate struggles experienced within the political economies of the two case studies, and to consider, in particular, how the sometimes intentional but often less than deliberate reproduction of key structures has frequently served to produce unsustainable outcomes. More precisely, the objective of the research was to test and refine the model at the heart of the thesis (figure 3.2) through its application to the case study industries. This was achieved, first through an historical analysis of the two case studies, and second by relating the model to present day situations.

The historical analysis revolved around a number of key texts including Mintz (1985), Deerr (1949), Abbott (1990), Coote (1987) and Blume (1985). This was complemented by an analysis of more specific secondary data sources covering the development of the sugar industries in both Barbados (for example, Watts,1987 and Beckles, 1990) and Queensland (for example, Graves,1993, Saunders, 1982, Manning, 1983 and Kerr, 1988). A range of primary sources were also used to provide background information on the two case study industries. The central significance which sugar held in the

Barbadian economy until recently has meant that some aspects of the industry's development such as acreages, yields and prices, have been quite well documented, for example in the records of various sugar mills and in a variety of official reports which have been commissioned into the industry (Booker Tate, 1993; AIMS, 1991; McGregor, *et al.*, 1979). Similarly the highly regulated nature of Australian sugar production has meant that similar data was relatively accessible (ABARE, 1985; ABARE, 1991a; SCIST, 1989). In both these cases, however, the amount of published qualitative data is less comprehensive.

The empirical component of the project was designed and conducted in accordance with established definitions of what constitutes an appropriate realist methodology (see sections 4.2 and 4.3 above). The concern was not to survey taxonomically defined or representative groups or individuals, but rather to focus on *causally significant groups* (Sayer, 1984). Interviews were conducted with a range of individuals in both Barbados and Australia, with these individuals being selected from groups who appeared to relate to each other either structurally or causally rather than because of any aggregate formal relations amongst taxonomic classes (Whatmore, 1994:33). In both case studies, an attempt was made to interview individuals both within and outside the sugar sector itself and to explore the interviewees' own interpretations of events, relationships and conditions. The need to extend the interview process beyond actors directly involved in the two sugar industries concerned was seen as important because of the potential significance of the broader context in which the two industries operate. For example, the general antipathy to sugar production which exists in the Caribbean as a legacy of slavery (Beckles, 1990) may well have a significant influence on present day events.

In accordance with Sayer's (1984:223) suggestion that respondents may be selected "one by one as an understanding of the membership of a causal group is built up", the selection of interviewees beyond the relatively small number initially targeted was effectively determined by the nature of the early results of the research, which served to elucidate apparently significant causal relationships within and between groups. Although such a research design may appear to resemble a directionless 'fishing expedition', it is accordant with realist concerns for 'explanatory penetration'

> " .... it is possible, though not mandatory! - for intensive research to be exploratory in a strong sense. Instead of specifying the entire

> research design and who or what we are going to study in advance, we can, to a certain extent, establish this as we go along, as learning about one object or from one contact leads to others with who they are linked, so that we build up a picture of the structures and causal groups of which they are a part (Sayer, 1984:244).

In practice, forty four taped interviews were conducted in Barbados and forty seven in Queensland during the first six months of 1994. A number of discussion groups involving farmers and representatives of the Canegrowers association were also held in Australia. In each of these locations, a wide range of actors were interviewed. These included: planters, farmers, mill workers, managers of sugar multi-nationals, estate workers, and individuals involved in the wider regulation of the industry - politicians, agriculture ministry officials, extension workers. Little difficulty was experienced in gaining access to appropriate interviewees in either Barbados or Queensland. Only two of the potential respondents approached in Barbados declined to be interviewed. Similarly, although Australia is a large country, the sugar producing areas are relatively small and those involved in the industry tend to be open and usually quite happy to discuss their involvement with and perceptions of the industry.

In Barbados, a preliminary analysis of the literature allowed apparently significant 'causal groups' such as plantation owners, small farmers, the government, the financial sector, and labour interests as articulated through the Barbados Workers Union, to be identified before the empirical phase of the research began. In practice, members of each of these groups were interviewed early in the research process. However, what emerged was a situation in which the initially identified groups were not particularly meaningful. The nature of what were in fact causally significant groups emerged as the research proceeded, for example, as the lack of distinction between apparently different groups such as the planters, government and various regulatory bodies became more evident. In practice, this lack of distinction is a significant element of the conditions in which Barbadian development takes place. Thus while subsequent interviews involved similar individuals, a new and more meaningful understanding of how causal groups were constituted evolved throughout the research process. In Australia, it was similarly possible to target initial interviews on members of apparently significant causal groups which included, farmers, the regulatory authorities, the financial sector, industry bodies such as the 'Canegrowers' association and the milling companies. Again it was possible to identify subsequent interviewees in the light of initial interviews. In this case, the groups were

more clearly defined and meaningful, but the importance of factors such as the ethnically defined communities which exist in some parts of the Australian sugar farming sector only emerged during the research process.

As Sayer (1984:2454) suggests, what is important to realist research is "learning from the respondents what the different significances of circumstances mean for them". And in accordance with this definition of realist methodology, the interviews although tape recorded, were conducted in a very loosely structured manner, and questions were kept as 'open' as possible. Although the interviews were largely unstructured, the aim of understanding causality in realist terms was used to steer the conversations. The interviews were not conducted in order to specify what is or is not sustainable (although in Australia, in particular, the vast majority of respondents were quite familiar with the term). Rather, they were conducted with the quite different objective of testing and refining the model outlined in figure 3.2 of this thesis.

As the literature suggests is appropriate (see, for example, Pratt, 1994), the research progressed iteratively as the initial model outlined in chapter three of this thesis was tested and refined. In both case studies, apparently significant causal mechanisms were identified and substantiated from a realist perspective. In practice, the identity and primacy of particular mechanisms tended to emerge during the empirical component of the project and subsequent interviews were focussed to explore these. Similarly, the nature and significance of the contexts in which the Barbadian and Australian sugar industries are developing also became clearer during the course of the empirical research and again an effort was made to focus discussion around these factors.

The final phase of the research involved a reconsideration of interview transcripts and primary data collected during the fieldwork and a reinterpretation of literature reviewed earlier in the research process. In practice, it was possible to identify and, to some extent at least, substantiate a number of apparently significant causal mechanisms and to begin to describe the significance of certain conditions. This, in turn, allowed further testing and refinement of the theoretical categories and model defined early in the research process.

The subsequent chapters of this thesis provide a general description of the global sugar economy, in chapter 5; while background information on the sugar industries of Barbados and Queensland is outlined in chapters 6 and 8 respectively. These two primarily descriptive chapters are each followed by chapters where the secondary and primary data collected in the research are analysed to provide a specifically realist interpretation of development in the case studies. The discussion in both the descriptive and analytical chapters draws heavily on transcripts of the interviews conducted in both Barbados and Australia. A significant number of verbatim quotations are included because these: (a) serve to elucidate the respondents own interpretations of causality and (b) are useful in defining the particular contexts in which development occurs in ways which capture the subjectivity of the strategies and actions of various individuals and groups. Chapter 10 attempts to synthesise the analysis of the case studies and to identify general insights into the nature of sustainable development. The final section of the thesis presents an evaluation of this project and it's conclusions and suggests how this approach might be further tested, refined and progressed.

Although as is normally the case with realist research, what was produced was a complex picture involving plural causal mechanisms which were perhaps incompletely related to the conditions prevailing in the case studies, it can still be argued that a 'practically adequate' explanation was produced. Certainly, further research would be useful in that it would allow a fuller evaluation of the mechanisms and relationships identified in the study. However, the project can claim to have made some progress both in terms of elucidating the causality of the unsustainable in the case studies, and in beginning to define a new methodology for exploring sustainability issues.

Chapter 5 **SUGAR**

This chapter provides a context for the two case studies which follow by outlining the nature of cane sugar production and the global sugar economy. The chapter begins with a brief description of the characteristics and history of sugar production. Consideration is then given to current patterns of production and consumption. Key features of the global sugar economy, including the ACP Sugar Protocol of the Lomé Convention, are outlined in the final section of the chapter.

5.1 **Sugar**

With significant production in over 115 countries, sugar is one of the most widely produced agricultural commodities in the world. In 1993, the world produced almost 111 million tonnes of sugar. At average 1993 prices, the total value of this production was in excess of US$28 billion. Approximately 30% of total world sugar production, worth around US$8.5 billion, is traded internationally each year. Sugar is also one of the world's most widely consumed foodstuffs with mean global per capita consumption amounting to around 20 kilograms per year (International Sugar Organisation, 1994).

Sugar production is closely associated with a range of practices and events which might well be considered to be unsustainable. The negative effects of the Florida sugar industry on the Everglades is perhaps the best known example of large scale environmental impact (see, for example, Usborne, 1994). In practice, however, whilst these may vary in their scale and significance, most if not all sugar industries involve environmental impacts of some kind (Abbott, 1990; Blume, 1985; Watts, 1987; Tomascik and Sander, 1985). Links between sugar production and socially and morally unsustainable practices are also well documented (see, for example, Tomich, 1990; Coote, 1987; Adamson, 1972; Hannah, 1989; Beckles, 1990; Sánchez, 1964; Graves, 1993).

Sugar is a compound of carbon, hydrogen and oxygen. It occurs in a number of different forms including sucrose, dextrose and levulose. As both dextrose and levulose are difficult to crystallise, most refined sugar is derived from sucrose. Although sucrose is found in all green plants, just two plants are commercially important: sugar cane which grows in tropical and sub-tropical areas; and sugar beet which is produced in temperate areas. Sugar cane production is generally, but not exclusively, associated with less developed countries whilst beet production is essentially a feature of the developed

countries of Europe and North America. Despite the dissimilarity of production methods, the sugar produced is essentially a uniform and homogenous product which does not differ significantly in its nature or quality. Thus sugar represents a good example of a major agricultural commodity where the developed and developing worlds are in more or less direct competition with one another. As Abbott puts it:

> "The industry is characterised by a number of contrasts and dichotomies which have enabled it to develop along two separate and independent geographical and political lines. Virtually all the world's supply of sugar beet is produced by the developed countries .... Cane sugar, on the other hand, is produced principally by the developing countries of Asia, Africa and Latin America (Abbott, 1990:1).

5.2 **Sugar cane**

Sugar cane, which belongs to the same plant group as maize and sorghum, is a perennial giant grass which thrives in tropical and semi-tropical climates. All varieties currently used in commercial sugar cane agriculture are hybrids of *Saccharum officianum L.* (Blume, 1985:37). The mature sugar cane plant is 12 to 15 feet high and has stalks of about 2 inches in diameter. Commercially produced sugar cane is normally grown vegetatively by planting setts - small sections of cane. Each sett grows a stool or cluster of about 8 to 12 cane stalks. Cane planted in this way takes about 18 months to mature before a first crop can be harvested. Until the cane plants become established, fields need to be weeded periodically. Within a period of a few months, however, the ground coverage is generally dense enough that weed growth is minimal. After cutting the remaining stubble will sprout again and can be harvested the following year. This practice is known as 'ratooning' and can be repeated for a number of years before the crop needs to be cleared and replanted. Ratooning is profitable because cultivation costs are minimised, but yields and sucrose content fall progressively with each ratoon. Thus an optimal ratoon cycle length, usually about four years, reflects a balance between reduced costs and falling returns (Blume, 1985;75).

Sugar cane will grow in most tropical and sub-tropical climates and in a range of different soil types. It is, however, susceptible to frost damage and requires a particular seasonality in the climate to grow well. Specifically, it needs adequate water supplies during certain periods of the growing cycle. In a number of climates sugar cane can be grown well using natural rainfall, although this implies a degree of risk as shortages of rainfall during the

growing season can dramatically affect both yields and sugar content. It is not uncommon for irrigation to be used, as it is for example in much of Southern Queensland.

Sugar cane is normally produced monoculturally, although in some countries rotational crops are traditionally included in the production cycle. In part at least because of these monocultural production techniques, commercially produced sugar cane is very vulnerable to a range of diseases, such as smut, Fiji disease and ratoon stunting disease (Humbert, 1968; Abbott, 1990; Blume, 1985). Accordingly, the productivity of the cane varieties used invariably tends to fall within a relatively small number of years and new disease resistant varieties have to be adopted. Even with the constant development of new disease resistant varieties, modern sugar cane agriculture requires large inputs of both pesticides and fertilisers.

The increased use of mechanical harvesters has greatly expanded the practice of cane burning. Cane burning involves setting fire to standing fields of cane prior to harvesting. This facilitates harvesting as it removes the outer leaves of the cane plants. Most mechanical harvesters are designed to cut only burnt cane, although machines are now available which will cut 'green' or unburnt cane. Hand cutters also prefer to cut burnt cane because this saves them the job of removing the leaves or trash by hand after the cane stalk has been cut. Green cane often has a number of agronomic advantages: the trash is ultimately returned to the soil increasing its organic content; and in areas of low rainfall a trash blanket helps to preserve soil moisture. In high rainfall areas, however, green cane harvesting is not always possible as the trash blanket can contribute to water-logging and can lower soil temperatures and thereby impede plant growth.

Historically, sugar cane production was a highly labour intensive operation often involving extremely unpleasant and arduous work - hence sugar cane's long association with slavery and other forms of coerced labour. A series of technological developments in agronomy, transport and processing have largely transformed the nature of cane production dispensing with the need for large amounts of labour. Traditionally, cane was cut by hand with a skilled labourer being able to cut around one acre per day. Mechanical cane harvesters were developed in the post war period mainly in Australia. A typical modern cane harvester can cut several tens of acres per day but costs in excess of US$ 300,000. These harvesters normally cut the cane two rows at a

time, separate the trash and chop the cane stalks into short sections known as billets. These are then loaded directly into trailers for transport to the mill. Although a small amount of cane juice is lost when cane is billited, chopped cane is much more easily transported and processed than whole stalk cane.

In some cane producing areas such as Australia the whole of the production process is now highly mechanised and cane is produced with relatively little labour. Conversely, other producers, such as Guyana, remain dependant on the exploitation of large numbers of very poorly paid workers. Even where cane is still cut by hand however, it is now normal for other aspects of the production process, such as loading into trailers or lorries, to be effected mechanically. The levels of mechanisation occurring in different parts of the world are discussed in some detail by Abbott (1990) and Blume (1985).

5.3 **Milling and Refining**

Sugar production is an essentially agro-industrial activity - unprocessed sugar cane, or for that matter sugar beet, has little direct utility or value. Turning cane into sugar is normally a two-stage process. The cane is first milled into raw sugar which is subsequently refined into granulated white sugar and other marketable products.

Sugar cane deteriorates quickly when cut and must be processed within a short time of harvesting, usually within a maximum of about fourteen hours. Thus cane growers need to be located within a relatively short distance of the factory which will process their cane. Processing involves washing, shredding and crushing the cane. The cane is then soaked in water which is heated and evaporated to leave sucrose which subsequently crystallises to form 'raw sugar'. This process creates two principle bi-products: bagasse and molasses. Bagasse is the residual cane fibre and is used mainly as a fuel to power the processing factories. Molasses is used in the production of rum, cattle feed and yeast, and can be further processed for human consumption. Historically, cane was most usually processed in small mills on the plantations where it was produced. Developments in technology and the need to achieve economies of scale have meant that processing is now almost always undertaken in relatively large centralised factories.

The raw sugar produced in areas where cane is grown is refined into the product familiar to consumers throughout the world in a separate process

which normally takes place in the countries where it is consumed. Conventionally, international trade in sugar involves raw sugar, which is refined into a marketable product in the importing country. Barbados, for example, exports raw sugar to Europe, and this is subsequently refined by Tate and Lyle in London. As much of the value adding is achieved in the refining and marketing of sugar, this arrangement tends to disadvantage producer countries. Historically, there were valid technical reasons why this pattern was necessary. These are now largely redundant as the technology exists to bulk transport refined sugar without any significant loss of quality.

5.4 **The history of sugar cane production**

The history of sugar cane is closely linked to that of European colonisation of tropical and sub-tropical parts of the world. Historically the vast majority of production was organised on plantation based systems using slavery and other forms of coerced labour. Various legacies of the industry's often unfortunate history remain important today.

According to Blume (1985:30) three phases can be identified in the diffusion of sugar cane:

> (1) 15th and 16th centuries: Dispersal within the American tropics; the colonial plantation based on slave labour developed there.
>
> (2) 19th and early 20th centuries: diffusion of commercial sugar cane agriculture occurred elsewhere in the tropic whilst still under colonial rule; the plantation system changed in many ways.
>
> (3) After 1950: In the era of decolonisation sugar cane agriculture has been introduced to many, mostly African countries eager to establish a sugar industry. Again, new types of structural systems in sugar cane production developed.

Although amongst the most widely produced and consumed agricultural products in the world today, sugar has only been consumed in significant quantities since the mid nineteenth century. Sugar cane was probably first cultivated in South East Asia some 10,000 years ago and spread through South Asia to the Middle East. The earliest references to sugar making appear in Sanskrit literature of the fourth century B.C., but sucrose was practically unknown in Northern Europe until around 1000 A.D. (See, for example, Deerr, 1949; Mintz, 1985; and Blume, 1985). Until the mid-nineteenth century sugar remained an extremely expensive luxury good in Europe, more properly thought of as a spice than a food *per se*. As Mintz puts it:

> "In 1,000 A.D., few Europeans knew of the existence of sucrose, or cane sugar. But soon afterwards they learned about it; by 1650, in England the nobility and the wealthy had become inveterate sugar eaters, and sugar figured in their medicine, literary imagery, and displays of rank. By no later than 1800, sugar had become a necessity - albeit a costly and rare one - in the diet of every English person; by 1900, it was supplying nearly one-fifth of the calories of the English diet" (Mintz, 1985:5).

Sugar's transition from a scarce luxury item to one of the world's foremost mass consumption commodities was certainly timely. During the second half of the nineteenth century two developments threatened to undermine the value of what had formally been a rare and expensive commodity. Just as improvements in cultivation and processing technology predicated a changing scale of production for colonially based cane sugar production, Europe began to develop an indigenous beet sugar industry. Mintz sees this transformation very much as part of a larger picture:

> "As the first exotic luxury transformed into a proletarian necessity, sugar was among the first imports to take on a new and different political and military importance to the broadening capitalist classes in the metropolis - different, that is, from gold, ivory, silk and other durable luxuries. Whereas the plantations were long viewed as sources of profit through direct capital transfers for reinvestment at home, or through the absorption of finished goods from home, the hypothesis offered here is that sugar and other drug foods, by provisioning, sating - and, indeed drugging - farm and factory workers, sharply reduced the overall cost of creating and reproducing the metropolitan proletariat" (Mintz, 1985:180).

However, whilst the transformations which allowed sugar production to be sustained and indeed expanded during the late 19th century were certainly opportune from the perspective of colonial sugar producers, they were hardly part of some grand and objectively promoted strategy to ensure the future viability of the industry. As Mintz suggests:

> "The profound changes in dietary and consumption patterns in eighteenth- and nineteenth-century Europe were not random or fortuitous, but the direct consequences of the same momentum that created a world economy, shaping the asymmetrical relationships between the metropolitan centres and their colonies and satellites. And the tremendous productive and distributive apparatuses, both technical and human, of modern capitalism. But this is not to say that these changes were intended, or that their ancillary consequences were well understood. The ways in which the English became the biggest sugar consumers in the world; the relationships between the colonial loci of sugar production and the metropolitan locus of its refining and consumption; the connections between sugar and slavery and the slave trade .... these and many other aspects of sugar's history must not be thrown together and labelled 'causes' or 'consequences' as if, once enumerated, they explained everything or anything by themselves. But it is possible to

point to certain long-term trends the general consequences of which are readily discerned (Mintz, 1985:158).

By the beginning of the twentieth century many of the key features of present day sugar production had already been established. Sugar had emerged as a widely produced agro-industrial commodity. And the duality of beet in the North and cane in the South had already become clear. During the twentieth century, most sugar cane producing countries were to become independent, but sugar's incorporation within a global capitalist economy and the unequal relationships embodied within this have remained highly significant.

5.5 **Current structure of world sugar production and consumption**

Today sugar, either cane or beet, is grown in more countries than any other agricultural product. Overall global sugar production rose from 52m tonnes in 1960 to around 101m tonnes in 1982 and continued to expand, albeit slowly, throughout the 1980s, reaching a level over 110m tonnes in the early 1990s. Within this, developing countries, essentially sugar cane producers, increased their share of the overall total from 52% in 1960 to 58% in 1983. Production in developed countries, primarily of beet sugar, fell from 48% of the overall total to 42% during the same period (FAO, 1987:7). (See figure 5.1).

Figure 5.1 **Sugar production: developed and developing countries**

	1960	1965	1970	1975	1980	1983
DEVELOPED COUNTRIES						
MILLION TONNES	25	30	32	35	38	40
PERCENTAGE	48	47	45	44	46	42
DEVELOPING COUNTRIES						
MILLION TONNES	27	34	40	45	45	56
PERCENTAGE	52	53	55	56	54	58

Source: FAO (1987)

Although as Mintz (1985) has observed developing a cane sugar industry has often proved to be "like holding Confederate currency", a significant number of Southern countries have either expanded existing production or established new sugar cane industries during recent decades. Several factors appear to underpin this development. These include: objectives of self-sufficiency in sugar production; inappropriate responses to short-lived hikes in the sugar price; inaccurate predictions of future demand; and the ready availability of capital from intergovernmental lending agencies (FAO, 1987:4). One the most striking examples of a rapidly expanding sugar industry in the South is

Thailand. Thai sugar production rose from 676,000 tonnes in 1961/62, to 1.7 million tons in 1981/82 and has continued to expand since then.

The world-wide average consumption of sugar in 1985 was 20.3 kilos per person. However, this gross figure masks large variations between countries. For example, in Australia per capita consumption in 1985 averaged 48.5 kilograms whilst Kampucheans only consumed an average of 0.7 kilograms in that year (FAO, 1987:5). Overall global sugar consumption rose from 49m tons in 1960 to 95m tons in 1984, but has been rising only very slowly since then (FAO, 1987; Licht, 1993). Three important factors emerge from the analysis of recent sugar consumption trends. First, a distinct dichotomy exists between the consumption trends existing in developed countries and those in developing countries. Second, there is a move away from the direct consumption of sugar which is in part being offset by increased consumption in manufactured food products. Third, traditional uses for sugar are increasingly being threatened by the adoption of a range of non-sugar sweeteners.

Direct consumption of sugar is currently falling in most developed countries, largely because of health concerns and the belief that sugars are fattening. Conversely, the demand for sugar is increasing in most developing countries (see figure 5.2). Direct consumption of refined sugar is, at best, static in most developed countries. To some extent, this trend has been counteracted by the increased use of sugar in manufactured food products. However, this market is itself tenuous as other major industrial sugar users, such as soft drink manufacturers, have been moving to artificial sweeteners (Heismann, 1993).

The development of various forms of artificial sweeteners has represented a major challenge to the world sugar economy over recent decades. Chemical

Figure 5.2 **Sugar consumption: developed and developing countries**

	1960	1965	1970	1975	1980	1983
DEVELOPED COUNTRIES						
MILLION TONNES	32	39	42	41	46	46
PERCENTAGE	67	66	60	54	53	50
PER CAPITA (Kg)	32	38	40	39	40	38
DEVELOPING COUNTRIES						
MILLION TONNES	16	20	29	35	41	46
PERCENTAGE	33	34	40	46	47	50
PER CAPITA (Kg)	8	9	11	12	12	13

Source: FAO (1987)

sweeteners such as saccharine and newer products such as aspartame have now been marketed for some time. Sugar consumption is also threatened by the expanded production of another agro-industrially produced sweetener - high fructose corn syrup (HFCS). The penetration of what were traditionally sugar markets by these sweeteners has at times been quite dramatic. For example, while US sugar consumption fell by 2.2 million tons between 1980 and 1984, consumption of HFCS increased by 2.3 million tons during the same period (Abbott, 1990:333). That said, the potential of these alternatives is itself limited. Whilst their growth has been promoted somewhat by health concerns over sugar, similar concerns are apparent with respect to most chemical sweeteners. Moreover, sugar has a range of organic properties which support its continued use in many products, for example it provides texture and acts as a preservative in manufactured foods.

Special sugars and non-food uses for sugar

Historically, the major bi-products of sugar production have been molasses and, derived from this, rum. Molasses is a marketable product in its own right, both for human consumption and in animal foods. Rum, however, is considerably more significant in terms of income generation and the majority of established cane producing areas have rum industries. A more recently developed non-food use for sugar has been in the production of ethanol for use as a vehicle fuel, most notably in Brazil (see, for example, World Bank:1980). Even given the atypical scale of the Brazilian sugar industry, however, ethanol production has hardly been an economically viable proposition and there seems to be little prospect of this end-use being developed in other producer countries in either the short or medium terms.

There is also some apparent potential in the bi-products of cane sugar production. Bagasse, which is the plant material remaining after the cane juice has been extracted, was traditionally burnt to fuel the crushing mills. It can, however, be made into a variety of paper and wood substitute products. A growing interest has been developing regarding the potential of sugar as a feedstuff for various processes within the chemical industry. Whilst this latter possibility may well prove to be very significant in the longer term - non-food uses for sugar and its bi-products are likely to remain a minor consideration in the immediate future.

In the short term, at least, the consumption of sugar as a foodstuff, whether directly or indirectly, is the only variable likely to have any truly significant effect on overall global demand. Estimates vary as to how much future growth is likely. Whilst there is clearly potential for increased consumption in the South as intakes approach those in the North and as a result of population growth, a whole range of uncertainties prevent any reliable prediction. Within this, however, it seems unlikely that any future growth will be anything other than modest. Certainly, it seems unlikely that the structural overproduction which currently exists will be negated by any demand side fix. Recent patterns of sugar production and consumption indicate a pattern of distinct and persistent overproduction. This appears to be underpinned by a range of factors. On the one hand, short-lived price hikes periodically result in new and expanded production. Beyond this, the global sugar economy involving as it does a high degree of protectionism and support for domestic industries also means that production is highly price insensitive. A factor which is exacerbated not only by the existence of fixed assets in established industries but also by the relatively long length of sugar cane production cycles (see, for example, World Bank, 1986).

Structural overproduction such as exists within the global sugar economy clearly represents an inefficient use of resources. And whilst this imbalance may well advantage some groups - essentially sugar importers and sugar multi-nationals - the depressing effects which it has on sugar prices is always going to be likely to promote the over-exploitation of both human and natural capital. In practice, sub-economic sugar industries tend not to be closed down. Rather, they struggle to remain sustainable by adopting more and more exploitative practices. In this sense, at least, a link may well exist between the nature of the global sugar economy and a whole range of unsustainable events and practices.

5.6 **The global sugar economy**

Boom and bust

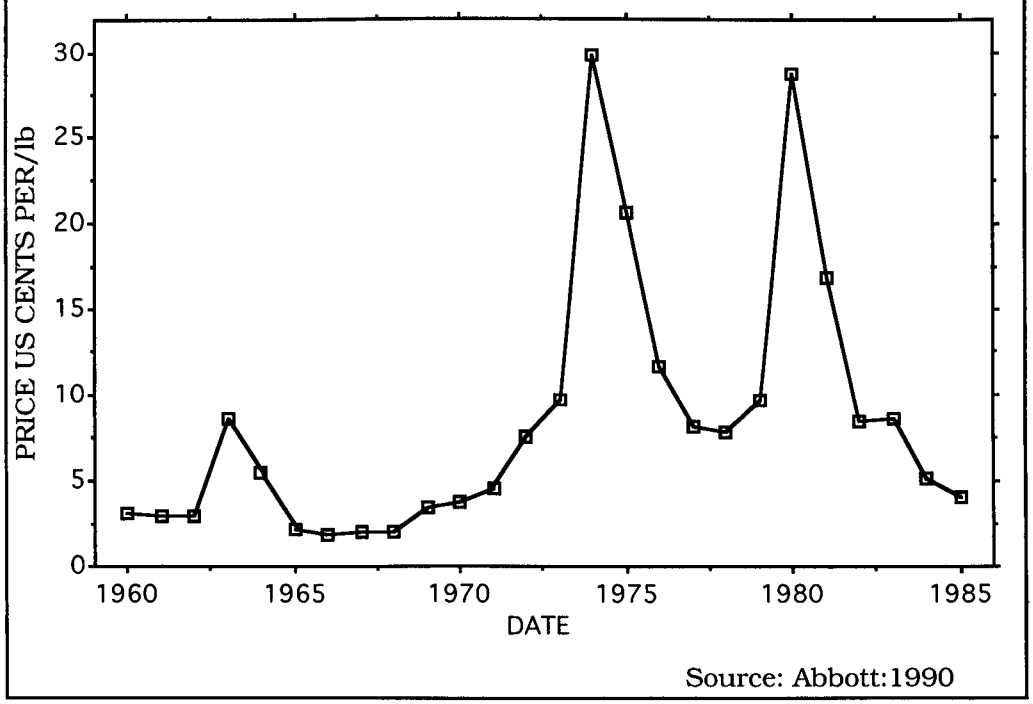
Throughout its history the global sugar economy has always been typified by boom bust cycles engendered by extreme price volatility. This pattern remains just as valid today as it did in the past (see figure 5.3). Recurrent short periods of high prices for sugar within the world market are seen as problematic because they encourage the entry of new producers and existing producers to

expand production. Borrell and Duncan outline the extent and effects of this extreme price instability in these terms:

> "In June 1985 the world market price slumped to an historic low of $0.06 per kilogram. A decade earlier, in the boom year of 1974, sugar had sold for a brief period at around $2.60 per kilogram (in 1985 values) and averaged $1.30 per kilogram throughout the year." (Borrell and Duncan, 1989:172).

In practice, sugar prices fluctuate markedly not just seasonally but often on a day to day basis. Although this is hardly apparent from figure 5.5, the market price of sugar has been falling in real terms ever since the introduction of sugar beet and the technological transformations of cane production which occurred during the nineteenth century. This underlying trend is disguised by both the volatile nature of the market and inflation but as Mintz (1985:158) suggests "the steady and cumulative decline in the relative price of sugars is clear enough". This decline is significant because in practice it has defined a progressively stressful context within which producers have had to produce sugar more and more 'efficiently' in order to remain competitive and hence sustainable.

Figure 5.3 **World market sugar prices 1960 -1985**



Source: Abbott:1990

International trade in sugar

Although global sugar production has risen in absolute terms the percentage of total sugar production traded internationally has been falling for some time. Over 70% of the world's sugar is now consumed in the countries where it is produced (Abbott, 1990; ISO, 1994; F. O. Licht, 1993). A high proportion of the remainder is exported under 'controlled market agreements' (Coote, 1987:38). In practice, there are two types of controlled market agreement: bilateral agreements; and special arrangements. Bilateral agreements, which accounted for about 15% of sugar exports in the mid 1980s, are normally fixed term contracts between exporter and importer countries which fix the quantity and price of sugar to be traded between the two countries. Brazil, for example had an agreement of this type to supply the Soviet Union with 320,000 tonnes of raw sugar each year between 1981 and 1985. Australia has entered into a number of such agreements with Japan and other countries. Some 25% of sugar exports occur through special arrangements. During the 1980s, the three most important of these were: the Sugar Protocol of the Lomé Convention, the quota system of the USA, and Cuba's trade with the Soviet Union and other Eastern European countries. This last arrangement is now effectively defunct. Blume summarises the situation in these terms:

> "Two sectors can be distinguished in the international sugar trade. Some 25% of the international trade is handled under special agreements, such as the 1974 Lomé Convention which regulates the trade between the EEC and ACP countries, and the preferential trade arrangements between Cuba and the COMECON countries. Apart from the sugar exports traded under these special arrangements a substantial amount of sugar is handled under long-term supply contracts, further restricting the world market which as a result is surprisingly small" (Blume, 1985:301).

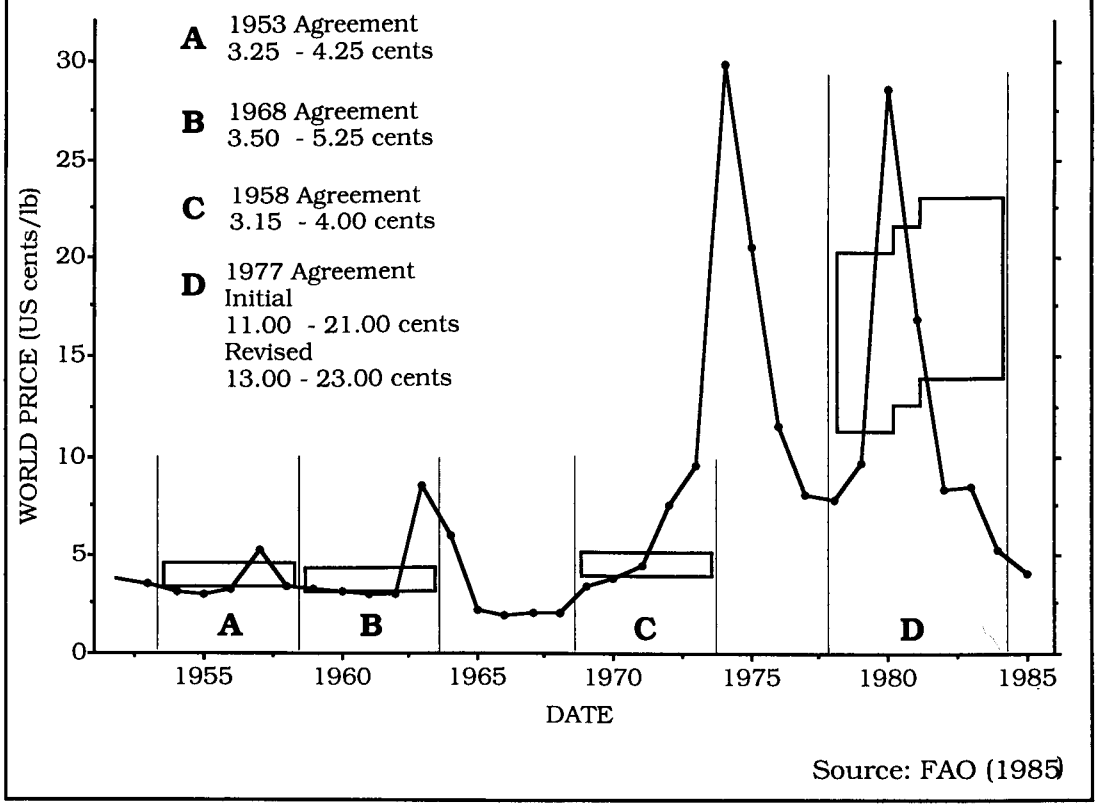
With only a small proportion of annual production being freely traded on the open market, the global sugar economy is in practice a 'thin market'. Such markets are very vulnerable to the effects of relatively small variations in output or disruptions to existing trading patterns and tend to react dramatically to any such events. As it currently operates, the global sugar market serves to: (a) increase the volatility in the price of openly traded sugar on the world market; and (b) to depress the price for sugar on the open market in the long term. This last factor is highly significant. Although a significant proportion of sugar exports occur under some form of bi-lateral arrangement, these are negotiated within the context of structural overproduction and the volatile but normally very depressed prices which occur in the residual market. This clearly prejudices the positions of exporter countries. Even where

bi-lateral agreements are negotiated successfully, these seldom involve any particular price premium over prevailing market prices. Moreover, it is not unheard of for importing countries to default on agreements when market prices fall below those previously negotiated.

Regulation of the international sugar economy

There have been a number of attempts to regulate international sugar trade and prices during the twentieth century. The most significant of these have been those promoted by the International Sugar Organisation (ISO) which incorporates both sugar exporting and importing countries. The ISO has promoted a series of International Sugar Agreements (ISA). Four ISAs have been instituted since the Second World War: 1953, 1958, 1968, 1977 (see figure 5.4).

Figure 5.4 **ISAs and world sugar prices**



Source: FAO (1985)

These ISAs attempted to keep sugar prices within predetermined bands by allocating Basic Export Tonnages (BET) - effectively voluntary export quotas - to producer countries, and through the development and controlled release of buffer stocks. In practice, the ISAs proved to be almost totally ineffective with prices straying outside bands for almost as much time as they stayed within them during the periods when the ISAs were in operation. When the 1978 ISA lapsed in 1984 it was subsequently extended for a further 2 years, but it was not possible to negotiate a new agreement. Although the ISO remains in existence, with offices in London, it now performs a purely administrative role and is mainly concerned with gathering statistics.

The effective failures of successive ISAs reflects various problems which included: non-participation of major parties including at various times both the EU and the USA; non compliance with BETs; free riding; and demand trends for sugar which have tended to be much more static than has often been predicted (Abbott, 1990; FAO, 1987).

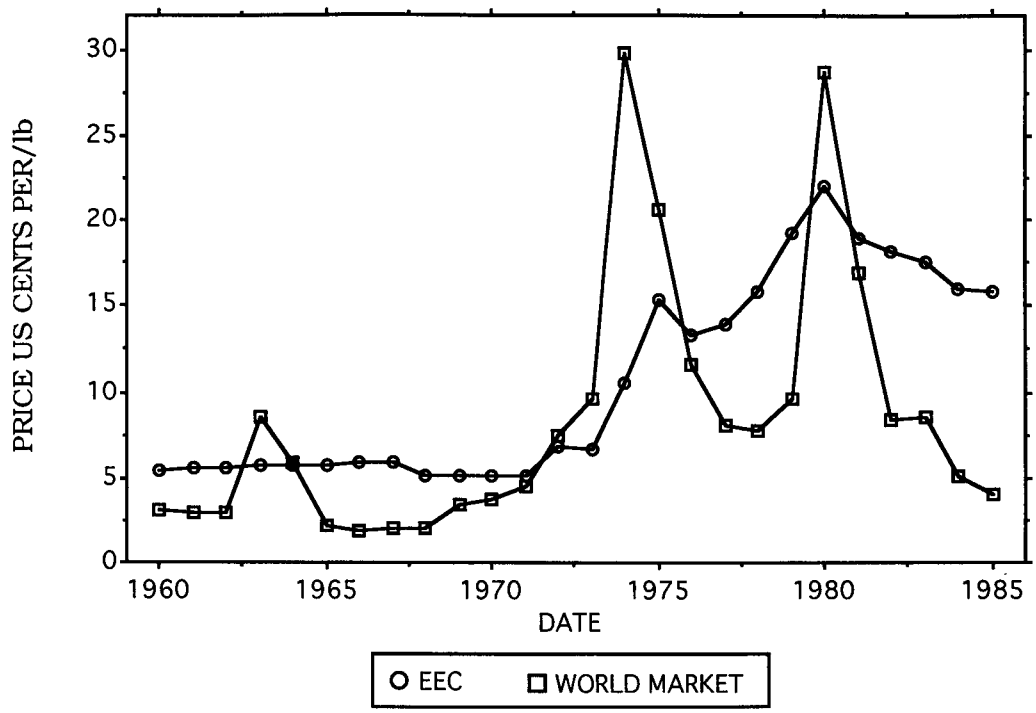
The Sugar Protocol of the Lomé Convention

The absence of any effective overall regulatory framework covering the global sugar economy has ceded a central significance to the policies and practices of the key players within the sugar economy. A small number of multinational companies have become increasingly significant at a global level. Tate and Lyle, for example, a British based company had a turnover of £3,817m in 1993. Tate and Lyle either own or have interests in over 90 companies which operate in over 30 countries (Tate and Lyle, 1994). Even more significant, however, are the policies of the major purchasers of sugar on the international market. According to Sturgiss, Tobler and Connell (1988), for example, the joint effects of EU, US and Japanese policies has been to depress the world price by around one third whilst increasing price volatility by 28%. The USA has various special trading arrangements with sugar producing countries, particularly in Central America, the Caribbean and the Philippines. The rationale for these has often been as much strategic as economic. European Union sugar policy has also had a highly significant effect on the global sugar economy. The EU is now one of the world's largest producers and exporters of sugar. Over and above this, it also has formal trading arrangements with a large number of Southern cane producing countries. These arrangements are formalised under the Sugar Protocol of the Lomé Convention.

The Lomé Convention was first signed in 1975. The objectives of the convention involved granting some protection to 64 African, Caribbean and Pacific (ACP) countries who then had trading arrangements with members of the European Community. The Protocol incorporated those colonies and former colonies which had traditionally exported sugar to Britain under the Commonwealth Sugar Agreement (CSA). Australia was the only CSA signatory which was subsequently excluded from the EU Sugar Protocol. Under the terms of the Protocol, the EEC agreed to import 1.3m tonnes of raw sugar from the ACP countries (World Bank, 198:143; Borrell and Duncan, 1990:180). Each sugar producing ACP country was allocated a quota based on historical trading patterns. Barbados, for example, was granted a quota of 54,000 tonnes of sugar. These quotas receive a guaranteed preferential price related to the 'A' quota price paid to European beet producers. Since 1975, European intervention prices have consistently been considerably higher than the world market price for sugar (see figures 5.5 and 5.6).

Although it was a net importer of sugar in 1975, the EC was exporting over 5m tonnes onto the world market by 1981 (Coote, 1987:100). Accordingly, all imports from ACP countries have been effectively re-exported onto the world

Figure 5.5 **EEC and world market sugar prices 1960 -1985**



Source: Abbott (1990)

Figure 5.6 **Financial benefits of the Sugar Protocol to ACP states (ECUs)***

YEAR	1975	1976	1977	1978	1979	1980	1981	1982	1983
ANNUAL QUOTA (m. tons)	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2
MEAN WORLD PRICE PER TON (i.e. LDP)	273	183	144	143	305	500	280	175	82
EEC GUARANTEED PRICE PER TON	255	296	312	327	339	357	391	401	443
DIFFERENCE EEC & LDP	18	114	167	184	34	-143	111	235	361
NET GAIN/LOSS FROM PROTOCOL	**24**	**148**	**218**	**237**	**44**	**-184**	**141**	**304**	**467**

* 1975 figures in European Units of Account (EUAs)

Source: Abbott (1990)

market since the late 1970s. Given the considerable premiums paid to the ACP countries, this has represented a not inconsiderable cost to the EC. However, recent CAP reforms and likely future changes in EU agricultural policy seem to indicate that the future of the ACP agreements are at best uncertain. In practice, the Protocol wording which covers the continuation of the agreement is somewhat ambiguous. Thus whilst the governments of the ACP countries involved tend to argue that the agreement is indefinite, most neutral observers believe its extension beyond the short term is highly unlikely. Any curtailment of the current EU arrangements would, most certainly, have significant economic, social and environmental impacts in many ACP countries.

5.7 **Sugar and sustainable development**

Sugar production and consumption incorporates a range of issues which are central to thinking on sustainable development. Individual sugar producing regions often use practices which by almost any definition are variously socially, morally or environmentally unsustainable. Understanding the causality of these unsustainable practices may well provide useful insights into the origins of the unsustainable in the more general case. Albeit for different reasons, the sugar industries of both Barbados and Australia have become increasingly stressed in recent years, and this stress has often been

reflected in a range of practices and events which might well be considered to be unsustainable. The contention here is that the relative transparency of many of the structures and mechanisms which underpin specific examples of unsustainability in the sugar sector is such that a multi-level understanding of this causality may be possible. If this is to be achieved, it is necessary to understand not only the specific, contingent conditions which vary between sugar producing regions, but also the relations between these regions and other parts of the world. It is also important to understand the institutions and values which regulate and serve to reproduce these relationships.

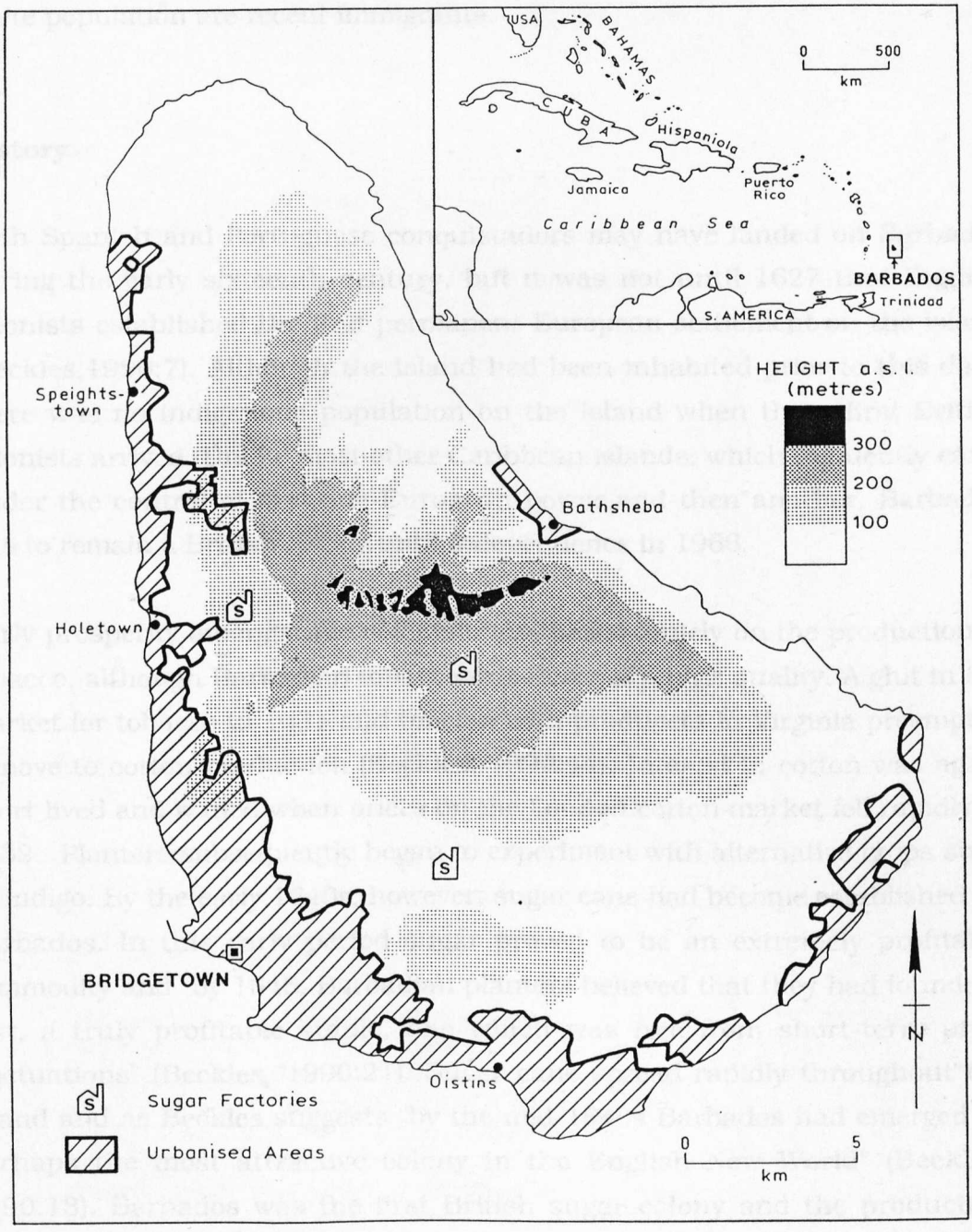
Chapter 6 **THE BARBADOS SUGAR INDUSTRY**

For over three hundred years sugar dominated Barbadian development. Almost every aspect of life on the island has been profoundly influenced by this single commodity. However, the Barbadian sugar industry is currently in crisis. This chapter begins with a brief description of Barbados and the island's history. The extent of the crisis which has befallen the sugar industry is then outlined. The remainder of the chapter is concerned to understand why the industry has collapsed and how this unsustainability is related to a range of other unsustainable practices and events on the island. What emerges here is a complex picture composed of partial and often contradictory explanations confused by the biases and self-interested perceptions of many of those involved in the industry. Within this, however, it is clear that the crisis cannot be adequately explained by the technical inefficiencies of Barbadian agriculture. Moreover, Barbados' access to protected and highly preferential markets suggest that the current problems cannot be fully accounted for in terms of externally generated pressures. The final section of the chapter begins to suggest how a more meaningful explanation of unsustainability in present day Barbados needs to be formulated within the racial and class structures existing in Barbados and the contradictions and tensions which exist within Barbadian society.

6.1 **Barbados**

Barbados is a small, tropical, anglophone island in the Eastern Caribbean lying 435 kilometres north east of Venezuela. The island is approximately 34 kilometres from north to south, 23 kilometres east to west and has a total area of 430 square kilometres. (See figure 6.1). Although the total population in 1992 amounted to only 259,000, population density is relatively high with 1,677 persons per square kilometre. Population growth is low having averaged considerably less than 0.5% per annum over the last 20 years. (GOB, 1993). Approximately 110,000 people live in Bridgetown, the island's capital, with the remainder living in either one of several smaller urban settlements or in more rural areas. Life expectancy and infant mortality rates of 73 years and less than 20 per 1,000 live births respectively are comparable with those in many European countries. Per capita incomes of US$5,200 in 1991 are relatively high in the context of other Caribbean countries (GOB, 1993:1). Health, education and welfare provision are all relatively well developed in Barbados. The island has a modern well-equipped hospital and health care is free at source. Literacy rates are comparable to those in the US and Europe. Secondary level education is compulsory and various forms of tertiary education are available. Barbados has a basic but effective welfare system incorporating old age pensions, unemployment benefits and social security provisions.

Figure 6.1 **Barbados**



The significance of slavery in Barbadian history is reflected in the fact that well over 90% of the Barbadian population are of African descent. Approximately 4% of the Barbadian population are white, with about 1.4% - around 4,000 - being indigenous Barbadians. The other two thirds of the white population are recent immigrants.

History

Both Spanish and Portuguese conquistadors may have landed on Barbados during the early sixteenth century, but it was not until 1627 that English colonists established the first permanent European settlement on the island (Beckles,1990:7). Although the island had been inhabited prior to this date, there was no indigenous population on the island when these first British colonists arrived. Unlike most other Caribbean islands, which frequently came under the control of first one European power and then another, Barbados was to remain a British colony until independence in 1966.

Early prosperity amongst the colonists was based largely on the production of tobacco, although Barbadian tobacco was never of a high quality. A glut in the market for tobacco in 1631 and tension with producers in Virginia preempted a move to cotton production (Beckles, 1990:14). Interest in cotton was again short lived and waned when prices on the London cotton market fell rapidly in 1639. Planters subsequently began to experiment with alternative crops such as indigo. By the early 1640s, however, sugar cane had become established on Barbados. In this early period sugar proved to be an extremely profitable commodity and "by 1645, Barbadian planters believed that they had found, at last, a truly profitable staple, one which was free from short-term price fluctuations" (Beckles, 1990:21). Sugar cane spread rapidly throughout the island and as Beckles suggests "by the mid-1640s Barbados had emerged as perhaps the most attractive colony in the English New World" (Beckles, 1990:13). Barbados was the first British sugar colony and the production systems established there were later to be disseminated throughout the English speaking Caribbean.

Having gained independence in 1966, Barbados is now an independent state within the British Commonwealth. Executive power is vested in the British monarch, represented by a Governor-general. Legislative power is exercised through a bicameral parliament, consisting of an elected 28 member lower

house - the House of Assembly; and an appointed 21 member upper house - the Senate. The two main political parties on Barbados are both broadly socialist: the Barbados Labour Party (BLP) and the Democratic Labour Party (DLP). The January 1990 elections were won by the DLP who gained 18 of the 28 seats in the assembly with 49% of the popular vote.

Economy

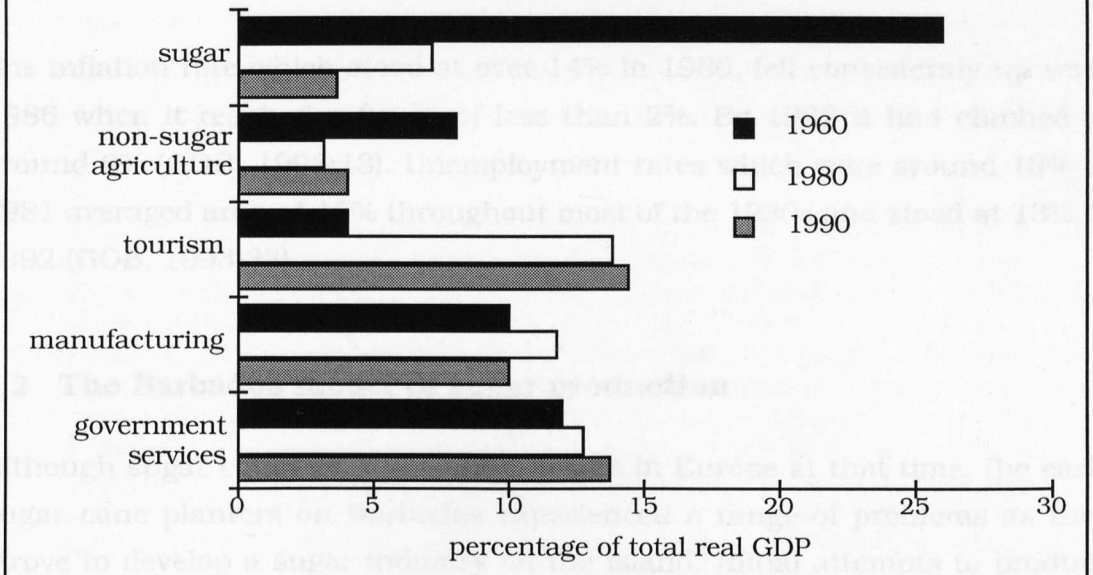
It would be difficult to overstate the importance of sugar in the history of Barbados. Within a few years of the first settlers arriving in the colony, Barbados was to become Britain's foremost sugar colony. Sugar rapidly came to dominate the island's countryside, its economy, its politics and the lives of its inhabitants. A small number of people were to make vast fortunes. As boom in the sugar economy periodically turned into bust, individual planters often lost their fortunes, but throughout all of this sugar was to remain king in Barbados for over three hundred years.

Until relatively recently the Barbadian economy was dominated by 'king sugar'. As Worrell puts it: "In 1946 ..... most economic activity depended on overseas trade. Sugar production dominated, accounting for over a third of GDP and bringing in two thirds of receipts from the sale of goods and services abroad" (Worrell, 1982:1). Throughout the post independence period, however, the sugar industry has become progressively less significant. As early as 1979 an official report into the industry noted the declining significance of this sector in Barbados:

> "Until about 20 years ago, sugar was unquestionably the mainstay of the Barbadian economy. Since then, the industry's share of gross domestic product has diminished, as a result of both the decline of sugar production and the growth of other industries, principally tourism. From a third of gross domestic product in the mid-1950s, sugar's contribution fell to about 20% in the early 1960s, and in the last three years has hovered around 6% (McGregor *et al.*, 1979:44).

In 1991 sugar accounted for only around 3% of GDP, with non-sugar agriculture accounting for a slightly larger figure. By 1992, Barbados' income from sugar exports amounted to only US$33.3m, which represented less than 23% of the total value of domestic exports. The tourist and manufacturing sectors were both considerably more significant than sugar by this time. See figure 6.2.

Figure 6.2 **Composition of GDP in Barbados 1960, 1980 &1990**



Source: Barbados Statistical Service (1992)

Within a period of less than thirty years, Barbados has moved from almost total dependence on a single agricultural commodity - sugar, to a similar dependence on its tourist industry. The Barbadian tourist industry developed rapidly in the 1960s and 1970s. As Worrell 1982 puts it:

> "Tourism rose from trivial proportions (it represented only two percent of GDP in 1956), to become the leading export earner in the 1970s, contributing 12% of real GDP in 1980. Its take-off began with a sharp upturn in 1957, followed by exponential growth. Because the sector was so small to begin with, it made its influence felt on the overall growth rate only in the mid-sixties" (Worrell, 1982:8).

With 432,000 visitors in 1992, the tourist industry contributed 11.4% of GDP and accounted directly for 16% of the work force (Pattullo, 1996). Tourist expenditure amounted to US$462m in 1992 (GOB, 1993:22). Various light industries, particularly electronics, accounted for 12% of GDP and 60% of the value of exports in 1992 (World of Information, 1994:67).

Throughout the last 20 years, Barbados has consistently experienced deficits in its visible trade balance (GOB, 1988; GOB, 1993). This deficit peaked at US$493m in 1990. Although the visible trade deficit is in large part negated by invisible exports, essentially tourism, Barbados' international debt has risen quite dramatically in recent years, climbing from US$381m in 1982 to almost

US$ 1,000m in 1992. This latter figure equates to around 25% of GDP and servicing this debt accounted for 17.8% of the value of exports in 1992 (GOB, 1993:39).

The inflation rate which stood at over 14% in 1980, fell consistently up until 1986 when it reached a figure of less than 2%. By 1992 it had climbed to around 6% (GOB, 1993:13). Unemployment rates which were around 10% in 1981 averaged around 15% throughout most of the 1980s and stood at 13% in 1992 (GOB, 1993:33).

6.2 **The Barbados model of sugar production**

Although sugar could command high prices in Europe at that time, the early sugar cane planters on Barbados experienced a range of problems as they strove to develop a sugar industry on the island. Initial attempts to produce sugar on Barbados were based largely on the 'Pernambuco model' which was already established on the South American mainland (Watts,1987). The technical expertise gained from Brazil enabled the industry to gain a foothold, but it was some years before Barbadian planters became knowledgeable and experienced enough to adapt the Brazilian techniques to suit local conditions.

With the possible exception of moderately inadequate levels of rainfall, especially in the dryer parts of the island, the climate and soils of Barbados are quite well suited to sugar cane production. That said, sugar cane can be a demanding and difficult crop to grow well and the initial enthusiasm of early planters was soon to be tempered by the emergence of a range of problems. One initial difficulty faced by would be planters was that of clearing the forests which covered almost all the island. Even when ring barking was adopted, the lack of any effective method of removing of stumps meant that clearance remained a labour intensive and expensive procedure (Watts,1987).

Early planters also experienced a range of agronomic problems including extensive and severe soil erosion and soil nutrient depletion. Although many planters had been taken aback by the totally unexpected fall in yields which accompanied these developments, solutions were soon found for each of these problems. Within a few decades of the first attempt to produce sugar on Barbados, an effective and agronomically sustainable sugar production system was already in place.

Several unique practices were developed, such as the specialist dung farms which produced the organic matter necessary for maintaining soil fertility. Another basic but successful and enduring adaptation to the environmental constraints on sugar cane production developed by the early planters in Barbados was the cane hole. According to Watts, cane holes were introduced to the West Indian landscape specifically as an erosion-control measure some time around the start of the eighteenth century.

> "Following the removal of the trash left from the previous crop, a systematic spacing of squares, approximately 5 feet in size, was marked out by hand hoes. In each square a hand 'hole', which measured two or three feet along each side, then was dug out to a depth of five or six inches. Once excavated, the holes remained unused until they were planted with cane in November: but the very existence of the two-directional system of ridges between them was sufficient to prevent or contain any down slope soil wash which threatened beforehand .... Cane holing should not be underestimated as being the first major, reasoned and largely successful attempt at controlling soil loss on sugar estates within the West Indies. Of local origin it was retained for many years ...." (Watts, 1987:402).

Whilst the early planters were able to address most of the environmental and agronomic problems which they faced quite effectively, the solutions found often involved highly labour intensive practices. And this in itself was to generate new difficulties as planters consistently experienced problems in ensuring adequate labour supplies.

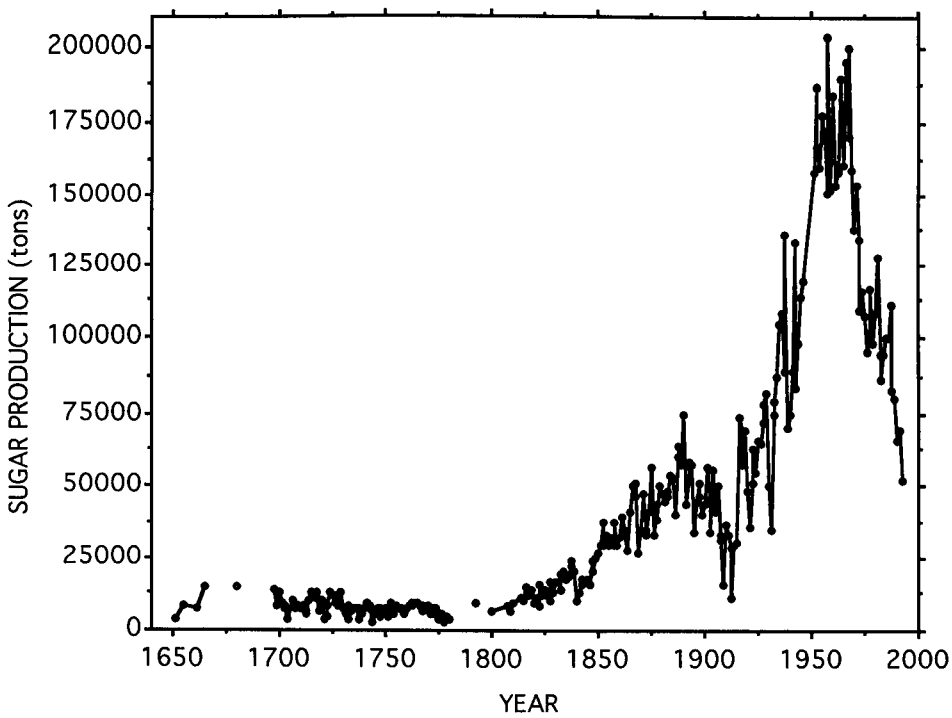
Over and above the environmental and agronomic problems which the early Barbadian sugar planters faced were the difficulties involved in turning sugar cane into a saleable commodity - sugar. During the seventeenth and eighteenth centuries, each large estate on the island had its own mill which processed the cane grown on that plantation, and in some instances that of smaller producers who could not afford to construct their own mill. There were, however, limits to how much cane could be processed given the technology available at that time, and larger estates would sometimes be broken down into separate production units each with its own mill when a single such facility could not cope with the production of the entire land holding.

Early mill technology was often rudimentary and knowledge of the processes involved was often inadequate. Indeed it has been suggested that the English were always behind the Spanish in the development and adoption of milling technology (Mintz, 1985). However, mill design and techniques were

progressively improved over the years as innovations such as the 'Jamaica train' were adopted. In parallel with these improvements, animal power was gradually replaced with wind powered mills throughout most of Barbados. In turn, windmills were progressively replaced by steam powered mills, which used the crushed cane stalks or bagasse as fuel.

Once established, sugar cane had spread rapidly through most of the island. Exact production figures for most of the seventeenth century are unavailable, but the island appears to have been regularly exporting around 15,000 tons of sugar per year to England throughout much of the second half of the century (Watts, 1987:285). Although sugar cane came to dominate the island's agriculture, production techniques, particularly milling technology, were such that it was not until the start of the nineteenth century that this level of production was expanded. Various developments during the nineteenth century, particularly the adoption of vacuum pans and centrifuges for processing cane juice into raw sugar, allowed production to be vastly expanded to meet the growing demand for sugar in the new urban industrial centres of Europe. Apart from short periods during the two World Wars, when priority was given to food production, sugar output rose steadily until the 1960s when it peaked at around 200,000 tons per year (see figure 6.3).

Figure 6.3 **Barbados sugar production 1650 - 1993**



Source: Watts (1987)

The nature of early sugar production techniques was highly significant in determining the patterns of development which occurred in Barbados. The practicalities of operating a sugar estate served to determine the pattern of land holdings which developed on the island. In practice, plantations needed to be of a particular size to be viable. Allied to this, the nature of sugar production also determined a particular and enduring pattern of social relations on the island. The costs of establishing and subsequently operating a working plantation - purchasing and clearing the land, building a mill and acquiring and maintaining a large work force - were extremely substantial (Watts, 1987:187). In practice, this served to limit the ownership of plantations to those with access to large amounts of capital or credit. As Watts states:

> "A crude, vertically oriented system of land use frequently was put into effect, with the rich bottom-lands being taken over by the 'big' and 'middling' landholders, and the poorer-quality ridgetops and intervening slopes left to the 'smaller' planters and freemen ..... Allied to this type of planter stratification, which by 1680 had become a fact of life in Barbados, a ruling estate-owner 'aristocracy' or 'plantocracy' also had begun to establish itself, in the sense that a restricted number of families commenced to control island affairs more completely than ever before" (Watts, 1987:332).

As Watts suggests, although smaller planters did exist during the latter half of the seventeenth century, the larger landholders were also the major sugar producers and they occupied an increasing dominant position on the island. Whereas estates in Brazil commonly operated a share cropping system whereby landowners leased land to small scale planters in return for a share of their sugar, their counterparts on Barbados tended to work their land themselves. Later technological development served to reinforce the established pattern of social relations. As sugar mills became more sophisticated only the largest estates could afford to operate such facilities, and thus any smaller cane growers found themselves dependent on larger enterprises for the processing of their cane. As the industry developed, many established small landholdings were quickly amalgamated into sugar estates of between 50 and 200 acres in size (Watts, 1987:188). A pattern of land holdings which, in its general form, has persisted to this day.

Another key difference between the Brazilian model and that which developed in Barbados was that whereas most estates on the mainland endeavoured to be as self-sufficient as possible, such a strategy was never pursued on Barbados (Watts, 1987:228). Again this was a feature of Barbadian development which once established was to remain highly significant. Indeed,

as sugar estates came to dominate the island, the philosophy of producing a single commodity and sustaining this production by importing all other requirements became a feature of the island as a whole as well as of individual estates.

The early planters in Barbados were largely successful in developing an effective and, in one sense, sustainable model of sugar production. At least it was sustainable in the sense that it allowed sugar to be produced for over three hundred years. Although individual planters were at times severely affected by various difficulties, sugar cane rapidly became king on Barbados. It has been argued, however, that the very success of the enterprise carried with it the seeds of its eventual demise. As Watts puts it:

> "Once the raising of cane sugar as a profitable commodity had been ensured, the general tendency was for planters to stay with what they had, rather than indulge in any further agricultural refinement and experimentation; and this proclivity was maintained as cane enterprises were expanded into other British and French islands within the region. As a result, the Barbados sugar production model came to be accepted as the norm, and its precepts formalised throughout. Indeed, one may argue that, in a very real sense, this model was in danger of becoming a fossilised feature of socio-economic life in the Caribbean almost as soon as it had become established, involving as it did structures in its field, factory, social and labour inputs that were so complex that change of any sort was hard to initiate." (Watts, 1987:383).

Thus whilst the Barbados model of sugar production was certainly sustainable in some ways - in practice, it produced sugar continuously for three hundred years so it must, for example, have been agronomically sustainable - the very nature of the model which implied inflexibility and resistance to change was eventually to prove to be its undoing. The eventual unsustainability of the sugar industry owed as much to internally generated tensions and an inertia inherent in its very nature as it did to any externally generated mechanisms.

Equally, whilst the Barbados model of sugar production may have proved to be sustainable in the sense that it existed for a long period of time, it can hardly be seen as being commensurate with notions of sustainable development. Not, at least, if these notions define development as a moral issue. Throughout almost all of its history the Barbadian sugar production has been dependant on the exploitation of various forms of coerced labour. Most significantly, it has had a long association with slavery. An association which many commentators suggest continues to be highly significant a hundred and fifty years after this institution was formally abolished.

Sugar estates on Barbados were first developed through the use of indentured labour, mainly British craftsmen and labourers contracted to work on the island for specific periods. However, it soon became obvious that the scale of labour required could not be adequately met in this way. "Contemporary opinion in Barbados was that the new sugar estates needed one labourer for every acre of land under cultivation, if all stages of production and milling were to be undertaken with reasonable efficiency: and after the first few years of experimentation with the crop, this requirement was doubled" (Barrett, 1965; quoted in Watts, 1987:202). Accordingly estate owners turned to the purchase of slaves to meet their labour requirements. There were 6,000 slaves working on estates in 1650 and around 20,000 by 1653. By the mid 1660s there were more slaves on the island than there were whites. By 1833, the slave-white ratio had reached over six to one, with over 80,000 slaves and less than 13,000 whites (Watts, 1987:311).

Although slavery persisted until emancipation in 1833, a number of tensions had begun to emerge within Barbados' slavery based sugar production system well before this date (Watts, 1987:218). The high white-slave ratios heightened fears of slave revolts. The costs of acquiring and maintaining slaves had also risen over the years and many estates experienced difficulties maintaining adequate labour supplies.

Being so small an island, the post-emancipation situation in Barbados was somewhat different to that in some other sugar colonies, for example Jamaica. On Barbados relatively little opportunity existed for slaves to leave plantations and engage in some form of subsistence agriculture. Virtually all of the land on the island belonged to the estates and there were no virgin areas to which freed slaves could migrate. As Adamson puts it:

> "Post-emancipation provides the cliché that everything must change in order that everything must remain the same .... The Negro was liberated from the plantation but, he was not free to develop his own economy and culture" (Adamson, 1972:255).

Sánchez evaluated a similar situation in the neighbouring island of Antigua:

> "His Britannic majesty's new subjects learned that the planters had agreed with one another to fix a salary for all the island (i.e. on abolition in Antigua) of 1 shilling for the most skilled workers and 9d for the rest. This wretched wage was less expensive to the planters than the maintenance, clothing, and lodging of each slave. The planters gained from the emancipation above and beyond the indemnity they received from their motherland" Sánchez (1964:24-25).

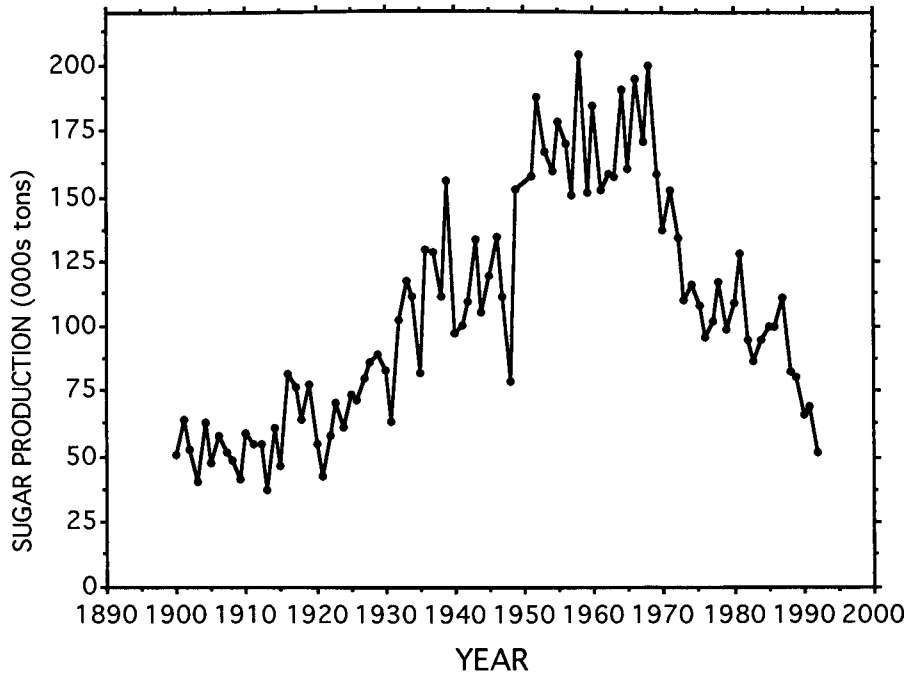
Thus whilst emancipation may have ended slavery *per se*, the basic patterns of social relations established in Barbados in the seventeenth and eighteenth centuries persisted in all but name until well after 1833. Indeed according to some commentators it still persists:

> "The plantation system, the race relations system, the managerial ideology, all these things are a legacy of slavery. Policy in the sugar industry today has to be seen as a survival of attitudes that have survived from the slavery period. Their approach to labour: cheap, cheap wages, lack of sanitary facilities, lack of continuous employment, these attitudes, as far as I am concerned, have all survived from slavery. Here is an industry that uses 80% of the agricultural land in this country and that land is controlled by the white community that is only 1.4% of the population .... to my mind that is unjust and needs to be rectified, this country needs land reform which places the ownership of the sugar industry in a larger number of people." (Personal communication, Barbadian academic).

6.3 **The sugar industry in post-independence Barbados**

Until well after the Second World War the sugar industry remained the dominant economic activity on Barbados. Sugar production which stood at about 50,000 tons in the first decade of the century tripled in the period up to 1970, peaking at a record high level of over 200,000 tons in 1967 (see figure 6.4).

Figure 6.4. **Barbados Sugar Production 1900 to 1992**



Source:BSIL records

Prior to Barbados gaining its independence from Britain in 1966, the island's sugar production was sold into three or four main markets. Some 5,000 tons were exported annually to the USA at a premium price under the terms of the US Sugar Act. A small but profitable trade existed with Canada who imported fancy molasses rather than sugar *per se*. Some 15,000 tons were used to meet domestic demand. During years of exceptionally high output Barbados also sold some sugar onto the world market. The principal market, however, was with Britain under the terms of the Commonwealth Sugar Agreement (CSA). Under the terms of the CSA Barbados was permitted to export some 136,610 tons of sugar per year at premium prices. An arrangement which afforded the island significant benefits. In 1962, for example, prices paid to Barbados under the CSA amounted to B$219.66 per ton whereas the average world market price during that year was B$124.71.

Following Britain's entry into the EEC, the CSA was extended for a number of years, but was subsequently replaced by the Sugar Protocol of the Lomé Convention which was signed 1975. All the former parties to the CSA, with the single exception of Australia, were incorporated within the Protocol. These African, Caribbean and Pacific (ACP) countries, including Barbados, received both a guaranteed market into Europe and preferential prices - equivalent to the 'A' quota price for European beet sugar. Barbados received a quota of 54,000 tonnes of raw sugar per year. As the McGregor Report observed in 1979:

> "this price arrangement is more favourable than that of the former Commonwealth Sugar Agreement to the extent that the Lomé price is indexed to EEC prices ..... normally EEC prices are likely to be substantially higher than free world market prices" (McGregor *et al.*, 1979:30).

Barbados' quota into Europe was substantially less than that which it had enjoyed within the CSA. Given, however, that production was already falling at this time, the majority of any surplus production was still accounted for by the US quota, the Canadian market for molasses and domestic demand, with little if any sugar being traded on the open market.

Following a period of high returns during the 1960s, sugar was still seen as being highly significant and quite viable at the start of the 1970s. And although the industry had started to contract, attitudes were still largely positive at the end of the decade. As the 1979 McGregor report into the Barbados sugar industry put it:

> "Sugar manufacturing is associated with Barbados to a far greater extent than with any other 'sugar island' in the Caribbean. Historically, this island's contribution to the world sugar industry, both in terms of technological innovations and output, has been quite out of proportion to its size. Even at today's output level, far below the peak of the 1960s, Barbados still produces about one ton of sugar per acre of national territory and nearly half a ton per inhabitant" (McGregor *et al.*, 1979:11).

By 1992 however, cane production in Barbados had fallen to eighteenth century levels. Production fell from a high of over 2 million tonnes of cane (tc) to a low of 528,000 tc in 1967. In 1960, the sugar industry had accounted directly for 20% of the island's labour force, by the early 1990s only just over 2% of the island's population were directly employed by the sugar industry. Sugar's contribution to GDP, also fell sharply. As late as 1980 GDP from sugar had amounted to B$94.2m (6.3% of nominal GDP), by 1990, however, sugar accounted for only B$58.5m (2% of nominal GDP) (Sparks Companies Inc, [SCI], 1992:20).

Structure of production

Historically, a small proportion of the total output of cane was produced by several thousand 'small farmers'. Small farmers in Barbados are conventionally defined as growers with less than 10 acres. In the 1982, several thousand small farmers produced 85,000 tc amounting to 14% of total cane production on the island. By 1992, far fewer small farmers produced only 22,000 tc, about 5% of, much reduced total production (Booker Tate 1993, vol. 1:4).

To some extent the factors which underpinned the falling production of this sector may reflect the same factors as those affecting the plantation sector. In large part however, it seems that small scale sugar cane production of this type has been declining as older farmers have ceased production and no new entrants have taken their place. In practice, many 'small farmers' had very limited holdings, typically only one or two acres and they almost invariably produced sugar cane merely as a supplement to some other source of income. Often these 'farmers' continued to produce cane more out of habit and tradition rather than for the minimal financial returns available (personal communication, BSIL manager).

Some 100 plantations have remained the principal cane producers in Barbados, see figure 6.5. In total the plantations account for just over 25,000 acres or approximately 80% of the arable land on the island. Most of these plantations have between 100 and 400 acres of cane land, the median size is just below 300 acres (Booker Tate, 1993, vol. 3). By the early 1990s, well over 90% of the sugar which was being produced on Barbados was grown on plantations (Booker Tate, 1993, vol. 3). The majority of these plantations are privately owned and operated, employing their own labour and using their own equipment. However, as McGregor put it in 1979:

> "The number of estates belies the degree of ownership concentration. Three companies - two public and one private - together with their subsidiaries own approximately 20% of the cane land. In addition the government-owned Barbados Agricultural Development Corporation (BADC) controls ten estates with nearly 1,300 hectares of cane land" (McGregor *et al.*, 1979:18).

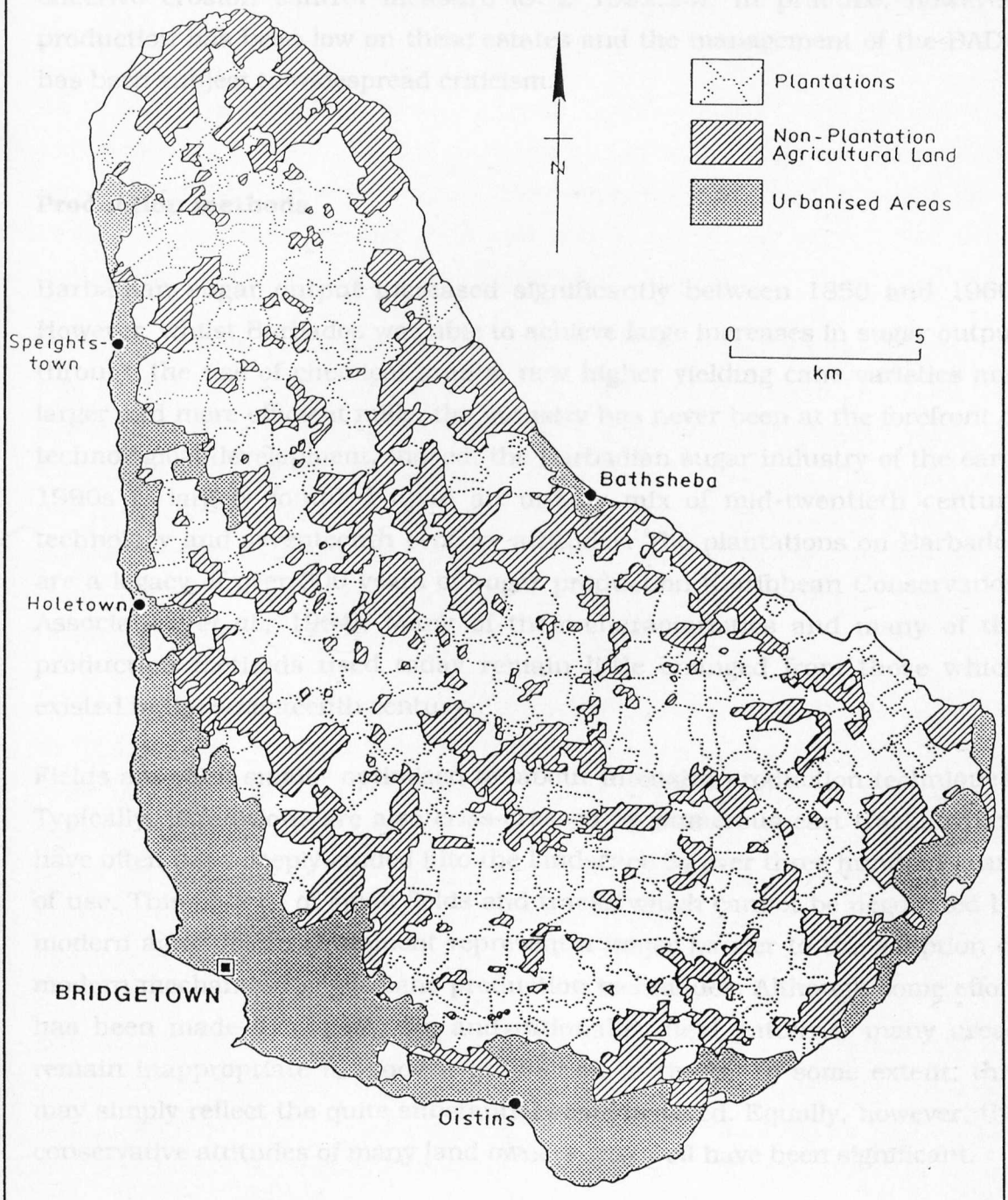
By the early 1990s land ownership had become even more concentrated with 5 companies controlling 35 estates which amounted to 15,662 acres or 55% of the 1988 harvested area (SCI, 1992:25).

It is common practice on Barbados for sugar estates to be managed by an 'attorney'. In the Barbados context, an attorney is the owner's representative and is given full responsibility for the running of the plantation. Attorneys are usually established and respected planters in their own right who are contracted to run other plantations. It is argued, at least by the attorneys, that there are a number of advantages to this system. In theory, they should, for example, be able to gain significant economies of scale by effectively treating the estates which they control as a single operational unit. Attorneys are paid a fixed fee per acre per month.

Historically attorneys were normally employed by British absentee owners who often never visited their estates. In recent years it has become more common for attorneys to be managing estates owned by upper middle class Barbadians or corporate owners who concern themselves with other business interests and delegate the management of their estates to these people. In 1988, some 85% of the sugar estates on Barbados employed an attorney. Just 7 attorneys controlled some 63% of the arable acreage on plantations (SCI, 1992:25).

In 1992, the GOB owned 9 plantations, with just under 3,000 acres of cane,

Figure 6.5 **Barbados plantations in 1979**



Source: McGregor (1979)

which it managed through the BADC. Although many of these estates are situated in agronomically marginal areas, government policy has involved maintaining sugar cane production, not least because this was seen as an effective erosion control measure (SCI, 1992:25). In practice, however, production has been low on these estates and the management of the BADC has been subject to widespread criticism.

Production methods

Barbadian sugar output increased significantly between 1850 and 1960. However, whilst Barbados was able to achieve large increases in sugar output through the use of chemical inputs, new higher yielding cane varieties and larger and more efficient mills, the industry has never been at the forefront of technological development. Indeed, the Barbadian sugar industry of the early 1990s is largely founded upon an unholy mix of mid-twentieth century technology and seventeenth century attitudes. The plantations on Barbados are a legacy of over 300 years of sugar production (Caribbean Conservation Association *et al.*, 1994). Many of their characteristics and many of the production methods used today remain little changed from those which existed in the seventeenth century.

Fields are often small - optimised to labour intensive production techniques. Typically, plantations are also criss-crossed by numerous cart tracks which have often been deeply eroded into the landscape by over three hundred years of use. This pattern of small fields and tracks which cannot be negotiated by modern agricultural equipment represent a major barrier to the adoption of modern mechanised sugar cane production techniques. Although some effort has been made to consolidate and rationalise field patterns, many areas remain inappropriate to modern production methods. To some extent, this may simply reflect the quite substantial costs involved. Equally, however, the conservative attitudes of many land owners may well have been significant.

Topographical constraints have also acted as a barrier to modernisation. Relatively steep slopes were not problematic when traditional labour intensive production methods were being used, particularly when cane-holing was adopted to prevent soil erosion. Much modern farm machinery, particularly cane harvesters, however, cannot cope with slopes much in excess of 10 degrees. The McGregor report estimated that about 25% of plantation land was unsuitable for mechanisation. Accordingly, a number of plantations,

mainly but not exclusively those in the Scotland district, have proved to be physically unsuitable for mechanised sugar cane production. Moreover, as the McGregor report points out "the areas potentially mechanizable are unevenly distributed. Few estates on the island are totally mechanizable" (McGregor, 1979:114).

In practice, although almost all cane is now loaded and transported mechanically, less than 50% of the cane was actually cut by machine during the early 1990s. This is problematic not simply because it requires high levels of labour, but also because it is and can result in the harvest not being completed before the onset of the summer rainy season.

Historically each plantation on the island processed its own cane in its own mill on the estate. During the late nineteenth and twentieth centuries this system has been gradually replaced with one based on centralised factories. Initially, a relatively large number of factories were operated, but progressive technological development has seen the majority of factories close. Of the fourteen which existed in 1970 only three were still operating in 1993: Bulkley, Saint Andrews and Port Vale. All of these factories are relatively small by modern international standards.

According to SCI (1992:23) Barbadian sugar factory costs are amongst the world's highest, at around B$500 (US$250) per ton of sugar in 1990. For the most part, factory equipment is old, outdated and inefficient. Despite this, capacity in each of the three factories is well in excess of recent production levels. In total, the remaining factories have the capacity to crush around 800,000 tc per year, which would produce approximately 90,000 tonnes of sugar (ts) (Booker Tate, 1993, vol 2).

Barbados Sugar Industries Ltd. (BSIL) was formed in 1973 to operate the sugar factories and to supervise transport and storage of sugar cane, raw sugar and other sugar products. It also had some responsibility for research and co-ordination within the industry. For example, it was responsible for co-ordinating cane harvesting to ensure a smooth throughput of cane in the factories and thus avoid delays during which time the sugar content of the canes would deteriorate.

Share ownership in BSIL was restricted to those major land owners who produce cane. The company was managed through a number of committees and a full time managing director. The GOB had a seat on the board through

which it represented the interests of small farmers and government owned plantations. According to Booker Tate:

> "BSIL tends to operate as a co-operative working for the producers. As a result it focuses more on distributing sugar proceeds to growers than generating profits and dividends" (Booker Tate, 1993, vol.1:3)

6.4 **Government support for the sugar industry during the 1980s**

Although the Barbados sugar industry had already started to contract during the 1970s, the industry was plunged into crisis when currency fluctuations produced a sudden drop in income during 1981. Both planters and the factory sector rapidly experienced liquidity problems. These problems led the Barbadian government to embark on what was, given the small size of Barbados, a massive programme of support for the sugar industry. By the end of the 1980s the total sugar industry debt to the Barbadian government amounted to more than B$1,000 for every person on the island.

Recent government intervention in the Barbadian sugar industry needs to be seen in the context of a long established tradition of such support. Within this, however, a number of specific reasons have been cited to legitimate what was, and indeed remains, an extremely high level of support given the very small size of the Barbadian economy.

Although earnings from sugar exports have fallen dramatically in recent years, sugar exports still represent one of very few sources of foreign exchange for Barbados. It is also widely claimed that unlike the situation with the tourist industry where a high proportion of inputs are imported, most of the earnings from sugar are retained within the island.

Whilst the sugar industry is now far less significant than tourism in terms of employment generation, it is still significant. Direct permanent employment in the sugar industry accounts for about 2% of the island's labour force. This figure almost doubles during the harvest period. Overall some 4,000 families derive some form of direct income from the sugar industry (Personal communication, IMF Representative). Further employment is also generated in a range of functionally related activities such as transport. Although, agricultural employment is generally unpopular amongst the Barbadian

population, a further reduction in employment opportunities would most certainly be politically negative, particularly in the light of recent high rates of unemployment.

Production costs for Barbadian sugar are far higher than the world market price for raw sugar and the Barbados sugar industry could not operate if it had to sell its sugar within this market (Booker Tate, 1993). For some decades Barbados sugar production has only been profitable and viable in the context of the ACP agreement and the other preferential markets to which Barbados had access. The 63,000 tons produced in 1981 was not sufficient to meet both domestic demand and Barbados' quotas into these markets.

Although the Barbadian government maintains that the ACP Protocol is indefinite and cannot be revoked, it is not clear whether this is indeed the case as the protocol wording is ambiguous. In practice, Booker Tate implicitly accepted the fragile nature of the quota in their report (Booker Tate, 1993, vol. 1). Certainly, persistent overproduction of sugar within Europe and changed strategic concerns mean that the EU faces pressures to revoke the ACP agreement and thus that it would be unwise for any country to further prejudice it's position by fulfilling its quota with sugar purchased on the open market. As the GOB are most certainly aware, any continued failure to fulfil their quota, or for that matter continuing to meet domestic demand with imports from the world market as has happened on several occasions, would almost certainly result in the subsequent loss to Barbados of this extremely preferential market. This apart, it seems certain that payments to the ACP countries will fall in real terms as support of European agriculture is cut back in the medium term.

Once sugar cane is cut, it needs to be processed within about fourteen hours or the sucrose content decreases rapidly. This processing can only be achieved efficiently in centralised factories. Such factories are necessarily of such a size that a minimum volume of cane is needed to support them. Thus, even within the context of Barbados' established and relatively small factory sector, a 'critical mass' exists below which the factories would be under-utilised to the extent that they could have no chance of operating profitably. Thus in a situation where less cane is being produced, the essentially fixed costs of the milling sector become increasingly significant and will potentially undermine the profitability of the industry as a whole. A similar argument can be seen to

exist with respect to other infrastructural and functionally related activities, such as the purpose built bulk sugar terminal used for handling exports.

Despite a rapidly falling acreage, cane remains the dominant land use on the island. In this respect, sugar cane is seen as being important to the island's environment. Certainly many of those involved in the sugar industry argue that it is highly significant in preventing soil erosion. The contention being that it provides uninterrupted ground cover for a period of at least four years and thus protects the thin and easily eroded soils. In practice, several areas in the Scotland District where large areas of sugar cane land has been abandoned or allowed to go to grass have experienced severe problems of erosion in recent years. During the 1980s, soil loss on vegetated plots in this district averaged 26.1 tons/soil/ha/year, whereas on bare plots it reached rates of over 319 tons/soil/ha/year (Soil Conservation Unit, 1987). That said, the effectiveness of sugar cane in preventing soil erosion remains questionable. Although it may provide more continuous ground cover than many crops, the harvest occurs immediately prior to the rainy season and thus cover is at a minimum when it is most needed.

The nature of sugar cane agriculture is also seen as being significant to the hydrology of the island (Barbados Water Resources Group, 1978). The limestone geology of the island means that there is little surface water on Barbados and most of the island's water demand is met from groundwater sources and springs which occur around the base of the limestone cap. Rainfall infiltrated during the summer rainy season either recharges the aquifer or occurs as throughflow to these springs (Antoine, 1989:4; Nurse, 1978). This throughflow takes several months and accordingly the springs are most productive after the end of the rainy season. Any large scale change in the island's vegetation cover, such as would occur if sugar cane production were to cease, would effect evapotranspiration and infiltration rates and might well impact severely on the established hydrological regime in ways which would prejudice the island's water supply security (GOB, 1956; GOB, 1979:59; Hudson, 1987:17; Trotman, 1994). Barbados' water supply security is also threatened by changes in albedo resulting from widespread landuse change (Watts, 1996).

The sugar industry is seen as contributing to the amenity value of the island's landscape. Given the current dominance of tourism in the economy, maintaining a landscape commensurate with tourists perceptions of a green

and productive tropical island is seen as highly significant (Booker Tate, 1993; SCI, 1992). The recent environmental degradation which accompanied the collapse of the sugar industries on other Caribbean islands, such as Antigua (Government of Antigua, 1991; Caribbean Conservation Association, 1991), is frequently cited as an example of the reduction in amenity value which can accompany the rapid collapse of a sugar industry. A further argument frequently cited by many planters to legitimate support for the sugar industry is that few if any alternative forms of agriculture are viable on the island. This would appear to be a dubious contention. The Barbados Ministry of Agriculture insists that a more diversified agriculture is both desirable and possible and they have maintained this as a primary policy objective for some time (GOB, 1956; GOB, 1965). Although non-sugar agriculture is now more significant in terms of GDP, sugar cane still accounts for a very high proportion of all agricultural land on the island. Indeed much of the value of non-sugar agriculture on Barbados is accounted for by the intensive production of chickens and pigs which has developed in recent years.

In practice, the reasons why only limited progress has been made in promoting a more diversified agriculture are not straightforward. The market for traditionally produced root crops, such as cassava and sweet potatoes, has been partially undermined by changing eating preferences. The local market for agricultural products is small and much of this is accounted for by the tourist industry which demands consistently high quality and security of supply. Also, export markets for high value agricultural commodities which might be appropriate to Barbadian conditions, such as cut flowers, are already highly competitive. But perhaps more significant than any of these factors, is the fact that Barbadian agriculture is effectively controlled by a very small group of people whose perceived self-interests may well not be suited by the development of a more diversified agriculture on the island.

Historically sugar has dominated Barbados. It has dominated the island's agriculture, its economy and the lives of its people. Although the absolute and relative significance of sugar in terms of income and employment generation has declined appreciably over the last few decades, sugar and related issues remain highly politicised on Barbados. Slavery and racial and class based tensions may have prejudiced public attitudes to the industry, but problems in the sugar sector continue to reflect badly on the GOB.

It is also argued by both the government and those involved in sugar production that further investment in the Barbados sugar industry is rational

because the large amounts of investment already committed to the industry cannot be recovered. Thus existing investments should be discounted in any cost-benefit analysis. In practice, this is a self-reinforcing argument in that when the situation is analysed in this way the case for further support increases each time more investment is made. Over and above this, however, whilst it may indeed be rational to add more water when the sink is already half full, this logic only pertains if the basin doesn't leak.

Even if a policy decision was made not to support the Barbados sugar industry, there would still be a need for careful management if a number of problems were to be avoided. A rapid and total collapse of the sugar industry would almost certainly leave a vacuum which would, in all probability, produce a range of unfortunate economic, environmental, social and political consequences. That said, any planned and phased closure of the sugar industry would be difficult for technical reasons, not least because of the 'critical mass' problem. Notwithstanding these problems, managed retreat would seem to be preferable to a laissez-faire approach which simply allowed the industry to collapse. Thus there may well have been a strong case for short term support of the industry, for example, whilst new forms of agriculture were established. In practice, however, the nature of GOB support for the industry has extended beyond this.

Support mechanisms

In practice, the majority of GOB support provided to the sugar industry during the 1980s was furnished through the Barbados National Bank (BNB). The BNB is a parastatal organisation. It was incorporated in 1978 as an amalgamation of several government owned financial institutions, including the Sugar Industry Agricultural Bank. The BNB's assets amounted to B$526.4m in 1989 (SCI, 1992:55). Although the bank's remit is technically wider than the sugar industry, including, for example a role in the development of social housing, its portfolio is dominated by loans to this sector.

Although it claims to operate as a commercial bank, the status of the BNB is somewhat ambiguous. Its intended objectives are broadly those of a development bank. Indeed it legitimates its lending, for example to the sugar sector, in terms of its developmental function. And whilst it claims to act independently of the government, its senior managers freely admit that policy is politically determined. Indeed, senior members of the bank's staff appear to

be somewhat uneasy with the situation in which they find themselves. According to senior bank employee:

> "When the role of the BNB is assessed it will be shown to have played a very positive role .... This division of the National Bank (the Agricultural Division) exists because it has a development role, but its commercial and development roles have become mixed up ..... As bankers we would sometimes have preferred to have adopted a more commercial position, but the bank is government owned and in fairness the Barbados government supported sugar both directly and indirectly ..... as an element of socio-economic policy - strict commercial banking would have used different criteria" (Personal communication, Manager BNB Agricultural Division).

The BNB provided soft loans to the sugar industry throughout the 1980s. Interest rates were capped at a maximum of 8%, although normal interest rates were well into double figures for most of this period. These loans were granted with little if any regard for normal banking criteria - income generation potential, equity or whatever. By the early 1990s the total industry debt to the BNB was in the region of B$250. Senior managers within the BNB maintain that lending policy throughout the 1980s was subject to direct political control (Personal communication, Deputy Manager BNB Agricultural Division). In practice, this is most certainly the case. The GOB is the only shareholder in the bank, the board of the BNB consists solely of political appointees and any substantial loans have to be authorised by the finance minister. The GOB also supports the sugar industry through a system of controls on the domestic price of sugar. This policy produced B$14m in income for the industry in 1992 (Booker Tate, 1993, vol. 1:8).

Government support for BSIL

Throughout the 1980s, the milling sector received considerable support from the GOB. Both the operational and strategic capital requirements of BSIL were financed almost exclusively by the GOB through the BNB. Loans to BSIL during this period exceeded B$100m (Booker Tate, 1993, vol. 1:6). Further to this, the GOB guaranteed sugar industry bonds issued by BSIL in the early 1980s to a total value of B$36m.

Government support for the agricultural sector

Traditionally, the plantations had been financed through a number of private banks. Whilst it was technically possible for operational capital supplied through commercial banks to be underwritten by the GOB, the commercial

banks did not take up this facility. In practice, the commercial banks effectively ceased to do business with the sugar industry in Barbados in the early 1980s. Commercial bank credit to the whole of the agricultural sector averaged less than B$30m - about 3% of total lending - during the 1980s, and little if any of this credit applied to sugar cane production (GOB, 1993:42). During the 1980s the BNB provided the sugar sector with credit some eight times higher than the total extended by commercial banks to the entire agricultural sector (GOB, 1993:24). Whether it was because the commercial banks declined to provide credit or because they chose to use the services of the BNB, most planters sought to finance both long and short-term capital requirements through the BNB (Booker Tate, 1993, vol. 1:4). In 1992, the BNB's loans to the agricultural sector totalled B$186.6m, with about 90% of this figure comprising loans to sugar plantations (SCI, 1992:55). By the end of the 1980s, GOB loans to the plantation sector amounted to B$6,800 (US$3,400) per acre of estate land on the island - a figure considerably above the value of the land.

6.5 **The Barbados sugar industry in the early 1990s**

Sugar production

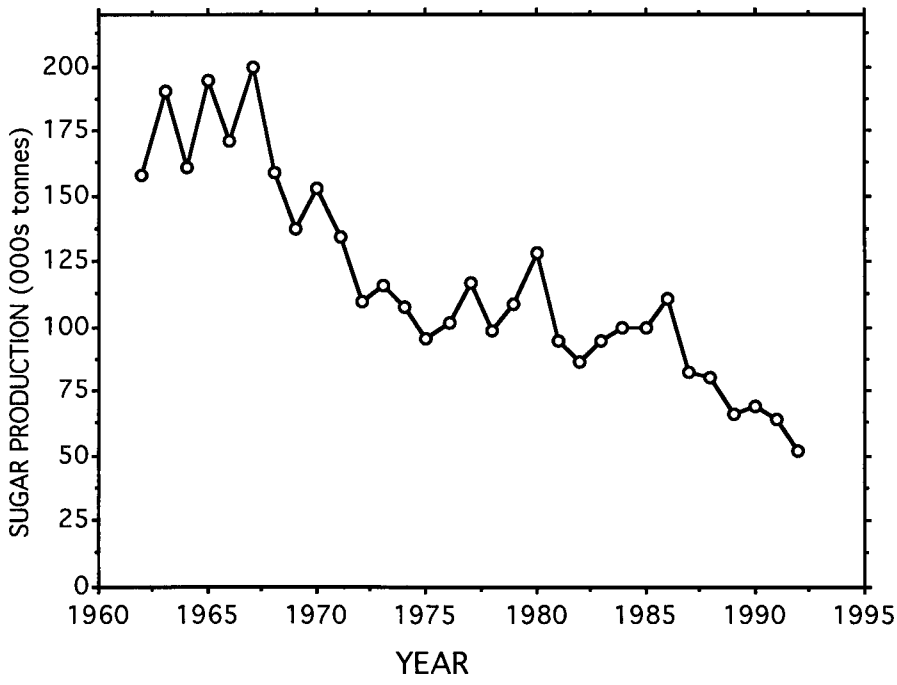
Despite massive government support during the 1980s, it was unavoidably apparent to all concerned that the situation of the Barbados sugar industry had gone from bad to worse during the 1980s. Sugar production which had already declined by over 60% since 1967, fell by a another third between 1981 and 1992, dropping from 75,000 tons to around 50,000 tons. This drop in output reflected both a reduced acreage under sugar and falling yields. In 1967 cane was harvested from 52,000 acres at an average yield of 35 tc/a. In 1992 22,000 acres were harvested with an average yield of 24 tc/a. (McGregor *et al.*, 1979:44; Booker Tate 1993, vol. 1: 4). (See figures 6.6, 6.7 and 6.8).

Figure 6.6 **Barbados sugar production 1967, -81 & -92**

	tc	**acreage**	**yields**
1967	1.80m	52,000	35 tc/a
1981	1,28m	40,000	30 tc/a
1992	0.52m	22,000	24 tc/a

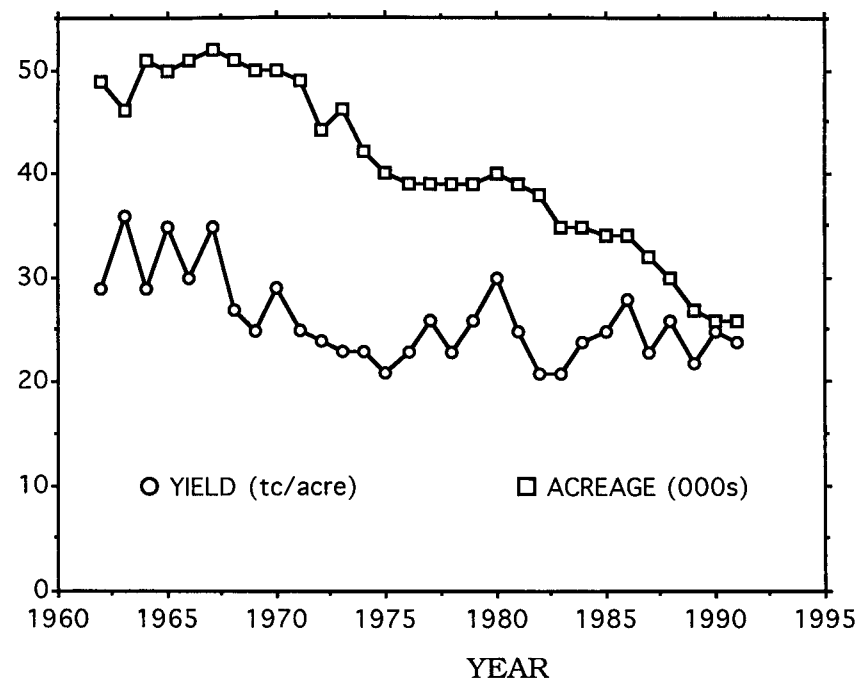
Source:BSIL Records

Figure 6.7 **Barbados sugar production 1962-1991**



Source: BSIL Records

Figure 6.8 **Barbados sugar cane acreage and yields 1962-1991**



Source: BSIL Records

By 1992, the US quota had not been fulfilled for some years and the profitable molasses trade with Canada had been lost. Even more significantly, production in 1991 was less than the ACP quota (54,000 tonnes) to the EU. The Barbados government maintains that it was able to meet the 1991 quota by using buffer stocks, although it does concede that sugar was imported to meet domestic demand (personal communication, Chairman Barbados Agricultural Management Corporation (BAMC)). Whilst it may be relatively apparent why this claim should be made, its validity is nevertheless somewhat questionable.

The financial status of the sugar industry 1992

By the early 1990s it had become unavoidably apparent not only that the support afforded the industry by the GOB during the 1980s had been largely ineffective, but also that this level of support could not be sustained. Both the factory sector and many individual plantations had accrued debts which they had no hope of servicing. And at a macro-economic level, the overall industry debt was beginning to have serious consequences for the GOB.

In 1992 BSIL had liabilities of B$170m and assets of B$40m. The majority of this debt was owed to the GOB although loans were also outstanding to the Caribbean Development Bank and to a range of private creditors (see figure 6.9). BSIL received loans throughout the 1980s to finance both capital expenditure and their day to day operations. However, despite the support which BSIL had received, the mills remained outdated and inefficient by international standards. Some investment had been made on upgrading machinery, particularly at the Port Vale factory, but despite this BSIL still experienced operational losses every year throughout the 1980s. By the early 1990s the company was clearly unable to operate profitably or to service its outstanding debts.

Figure 6.9 **BSIL debts - 1992**

Caribbean Development Bank	B$ 3m
BNB	B$110m
Sugar Industry Bonds	B$ 36m
Creditors	B$ 21m
Total BSIL debts	B$170m

Source: Booker Tate (1993)

Although Booker Tate estimated BSIL's assets at B$40m, even this low figure need to be treated with some circumspection. In practice, BSIL assets, which essentially consist of three sugar mills, only have any value if a viable sugar industry remains on the island. If the industry were to close, it is unlikely that BSIL's assets would have any real value, certainly little if any of their mostly old and outdated plant could be sold abroad (Booker Tate 1993, vol. 1:6).

The indebtedness of plantations to the BNB at 30 June 1992 was B$113m. Approximately B$30m was owed to other creditors. See figure 6.10. Some 52 plantations were unable to service their debts to the BNB at this time. Of these 40 were categorised as Heavily Indebted Plantations (HIP) and 12 as Moderately Indebted Plantations (MIP). The distinction being that HIPs were not in a position to continue production because they could not meet their day to day operational costs. HIPs accounted for 13,000 acres or 46% of the cane land in Barbados (Booker Tate, 1993, vol. 1:6).

Figure 6.10 **Plantation debt to BNB - 1992**

	Number	**Debt to BNB B$m**
HIP	40	103
MIP	12	10
Total	52	113

Source: Booker Tate (1992)

Whilst the BNB's accounting procedures effectively separate the agricultural and milling sectors of the sugar industry, in practice, the debtors are the same people. As share ownership in BSIL was restricted to estate owners and virtually all planters are members of BSIL, both sets of debt are owed by the same group of companies and individuals.

An unsustainable situation?

According to Booker Tate, a total of B$249m (88%) of the total industry debt could be regarded as delinquent in June 1992. To be properly understood, this level of debt needs to be considered in the context of the small size of Barbados and its economy (Booker Tate, 1992, vol. 1:6). Of the 100 plantations on Barbados 52 were categorised as being either HIP or MIP. Individual HIPs typically had debts of around B$2.5m. Of those 48 plantations

not classified as either HIP or MIP, 10 were already owned and managed by the Barbadian government (AIMS Report, 1991). By 1992, plantation debt to the BNB represented approximately B$1,000 per person in Barbados. By this time, two things were clear. First, it had become unavoidably obvious that despite the very high level of support which it had received, the sugar industry was in crisis. Second, it was equally apparent that this level of support could not be maintained.

6.6 **The Barbados sugar industry restructuring plan**

By the early 1990s, the Barbados sugar industry was clearly on the point of total and imminent collapse. A large number of growers could not operate because of their indebtedness, and more and more land was being taken out of sugar production. 1991 production had not been sufficient to meet both domestic demand and the 54,000 tonnes ACP quota into the EU. Sugar was being imported from the world market, ostensibly to meet domestic requirements, and the continuance of the quota arrangements was becoming increasingly prejudiced. The level of sugar industry debt to the BNB was such that it was placing considerable pressure on the Barbados currency and the IMF were keen to see positive action taken. In fact, the situation was such that unless radical measures were taken very quickly the industry would, in all probability, have ceased to exist within the next year or two.

In 1992, tenders were invited from firms wishing to plan and manage a restructuring of the industry. Three firms submitted tenders. Booker Tate - a jointly owned subsidiary of Tate and Lyle and Booker plc whose primary interests are managing sugar cane estates - were commissioned to formulate and manage a restructuring programme in 1993. It is somewhat unclear to what extent the engagement of a foreign firm to manage the sugar industry restructuring programme was a result of pressure from the IMF. Certainly, it was perceived as somewhat demeaning for the GOB to have to engage an outside body to manage what had traditionally been the mainstay of the island's economy. The appointment was also contentious because of Booker Tate's relationship with Tate and Lyle who are effectively the market for all Barbados' sugar exports. These points aside, however, there may also have been a degree of political expediency in the appointment as it allowed the GOB to distance itself from what is in some ways a no win situation and moreover one which might well involve a number of politically unpopular policy

measures. In practice, the role of Booker Tate was somewhat disguised by the formation of a Barbadian management company, the Barbados Agricultural Management Company (BAMC) which would, in theory at least, have strategic control over the restructuring programme. In practice, however, both the day to day management and strategic planning have been placed largely in the hands of Booker Tate.

Booker Tate identified their primary objective as securing Barbados' preferential markets, in particular the EU quota, but also delinquent quotas to the US. Accordingly, their plans were formulated around the need to produce around 75,000 tonnes of sugar per year (ts/y).

In the short term, some form of debt work out scheme was needed to allow the industry to continue to function. In the longer term, however, it was clear that to use Booker Tate's words "quite radical" measures were needed if the industry was to remain viable (Booker Tate, 1993, Executive Summary). Booker Tate's report suggested two alternative strategies for restructuring the Barbados sugar industry. The first of these involved foreclosing on HIPs. This was not adopted, in part at least, because it was unclear whether the loan agreements between the BNB and the planters allowed for foreclosure. In any event, as the Booker Tate report acknowledges, action of this type would, in all probability, have resulted in extensive and long lasting litigation. The second strategy, which was subsequently adopted by the government, involved leasing the HIP's arable land for a period of 12 years.

Thus when the restructuring programme was commenced in 1993, BSIL, the HIPs and the government plantations all came under the direct, if temporary, control of BAMC and Booker Tate. BSIL was effectively wound up and the HIPs were leased for twelve years in line with Booker Tate's recommendations. Under the leasing arrangements, rents from the estates are paid directly to the BNB to service debts, but freehold title to the property remains with the individual plantation owners and they retain the opportunity to regain control of the land when the leases lapse in 2005, provided they are then in a position to repay any remaining indebtedness.

Before submitting their tender for the contract to restructure the Barbados sugar industry, Booker Tate undertook a detailed study of the industry and completed a five volume report of their findings (Booker Tate, 1993, Executive Summary and main report, volumes 1 to 4). In this report Booker Tate identify

a range of inefficiencies in both the agricultural and factory sectors. And in practice, the substance their restructuring plan centres around attempts to achieve efficiency gains and cost savings by addressing these inefficiencies. In particular, they argue that the plantations have been highly inefficient in their use of both labour and machinery. Booker Tate claim that considerable cost savings are achievable if current practices are rationalised. In practice, Booker Tate have consolidated the HIPs and the government owned plantations into three operational units. This they suggest will allow them to use both machinery and labour more efficiently. They also propose to close one of the factories - Bulkley - after the 1994 harvest.

Given the obvious inefficiencies existing on many plantations prior to Booker gaining control, significant cost savings may well be possible. Whether these will, in themselves, prove to be sufficient to allow the industry to become viable in the future is far from clear. Certainly, a range of technical problems, and perhaps even more significantly social problems, will undoubtedly prove to be beyond the scope of Booker Tate's compass and resources. And as Booker Tate have recognised themselves, there are other, more 'intangible', factors underlying the collapse of the industry:

> "Perhaps the largest obstacle to a successful restructuring is intangible - the existing industry culture and its ability to change. The culture within the sugar industry is typical of a shrinking and unprofitable industry. Symptoms include:
>
> a) The average age of employees is high;
>
> b) Training and development of staff and succession planning are virtually non-existent;
>
> c) Staff moral, team spirit and employee productivity are declining;
>
> d) Investment in replacement equipment and new technology are low;
>
> e) Effort is focused more on obtaining subsidies from government than improving operating practices;
>
> f) Conflict between parties involved in the industry is frequent and sometimes prolonged; and
>
> g) A poor image in the eyes of the public.
>
> h) Most fundamentally those involved in the industry are resistant to change. If the sugar industry is to continue in the longer term a

> fundamental change in culture is required .... currently the industry is fragmented among many interrelated groups. Conflicts of interest exist between these groups which sometimes operate to the detriment of the industry as a whole" (Booker Tate, 1993, vol.1. pp12 - 14).

Booker Tate may well be able to promote a more rational and efficient use of the resources which the industry currently possesses. But they have inherited not only an industry in crisis but also one which has been slowly haemorrhaging for some time. Years of under-investment mean that most of the limited amount of machinery which is available is old and often obsolete. This is the case in both the factory sector and on the estates. In their initial study of the industry, Booker Tate compiled an inventory of the agricultural sector. They found only a minimal amount of machinery on the HIPs (Booker Tate, 1993, vol. 1).

Given that Booker Tate's strategy revolves around achieving efficiency gains they also face another problem in that they control only about half of the arable land on the island. Thus they will be obliged to operate with fragmented holdings. Booker Tate do propose to invite non HIPs to participate in the programme on a voluntary basis, but it is far from clear how many of these will opt to join the scheme.

Somewhat curiously many of the HIPs are on good agricultural land. Others, however, including most of the government owned plantations for example, are agronomically very marginal, with low rainfall and inappropriate topographies. Thus a further problem for Booker Tate is that much of the land involved in the restructuring programme is not particularly suited to sugar cane production. Accordingly, whilst the logic of the programme is predicated on efficiency gains, which in practice means achieving economies of scale, much of the land being used is not really suitable for the kind of mechanised production which Booker Tate perceive as being synonymous with efficiency. Even on high grade land the achievement of efficiency gains will require what is, in the Barbadian context, quite significant further investment. Booker Tate estimate the cost of the measures currently being undertaken at something over B$100m (personal communication, Booker Tate Manager, Barbados). Whether sufficient support will be forthcoming in the future is far from clear. Indeed it is far from clear whether such support should be given even if the GOB could find the resources which would permit them to provide it. As

Booker Tate's manager in Barbados prognosticated "the best we can offer the industry is hope".

6.7 **Explanations of crisis in the sugar industry**

As Booker Tate suggest, while there are clearly a range of technical explanations for the current crisis in the Barbados sugar industry, there are also a range of other, more fundamental, causes underpinning this unsustainability. Although the explanations offered by key actors in the industry often focus on technical considerations, deeper explanations also begin to emerge. When these explanations are considered within the social, economic and political conditions pertaining in Barbados, it is possible to construct a multi-level and in some respects powerful understanding of what has been unsustainable in Barbados. The explanations most commonly proposed are outlined in the next section of this thesis.

1. **Currency fluctuations in early 1980s.** When asked what caused the current crisis in the Barbadian sugar industry, almost all interviewees claimed that the fall of European currencies relative to the US dollar in 1981 played a significant role. The Barbados dollar is linked directly to the US dollar, but EU sugar payments are made in ECUs. When European currencies, and hence the ECU, fell sharply against the US$ in the early 1980s, sugar receipts in Barbados fell by almost 40% within a few days. Although exchange rates returned to something nearer 1980 levels over a period of 3 or 4 years, the effects of the 1981 price shock are widely held to have been much longer lasting. One planter outlined the situation in these terms:

> "In 1980 there were five Bajan dollars to one American dollar and it was the highest exchange value against the pound sterling and the bajan dollar and the American dollar. When you sold your cane to England you were getting approximately B$1,750 per ton. By 1982 when the pound sterling had fallen so much that it was worth only three and at one stage two Bajan dollars we were getting around B$700 for a ton of sugar. That destroyed the industry. It was the exchange rate and nothing else at all. If you think that it is something else you are fooling yourself. Everybody will tell you all sorts of different things, but that was really what the problem was" (personal communication).

Booker Tate's manager in Barbados outlined his similar perspective on the situation in these terms:

> "What we shouldn't say is that the decline in the Barbados sugar industry is due to these secondary things which are inefficiencies - bad management, excessive labour costs, poor capitalisation. That wasn't the reason why it went down. It was an underlying reason why it was inevitable that it eventually would go down. Actually it went down because of the exchange rate" (personal communication).

The rapid and severe drop in incomes experienced by both the planters and BSIL in 1981 certainly did have a profound effect on the sugar industry in Barbados. That said, it is far from clear whether this factor can be seen as the sole or even the principal cause of the crisis. It may well be that a sounder, more efficient, industry could have weathered this price shock somewhat better than the Barbadian industry did. From this perspective, the events of 1981 served to expose underlying inefficiencies which, it might be argued, were the real cause of the industry's decline. Equally, however, the events in 1981 perhaps were crucial in that they persuaded many planters that there was no future for the sugar industry in Barbados. Once this had happened it became rational for planters to adopt strategies which recognised this. In practice, it may well have been these strategies which turned probability into inevitability.

2. **Misappropriation of price stabilisation funds.** The planters argue that moneys paid into a sugar industry price stabilisation fund were misappropriated by the government to finance the development of social infrastructure, e.g. the Princess Royal Hospital. The suggestion being that these funds (estimates vary as to what their value would have been by the early 1980s, but certainly over B$100m) would have gone a long way towards offsetting the consequences of the effective price collapse experienced in 1981. The government claims that for the most part these funds were used to develop infrastructure functionally related to the sugar industry, e.g. the new harbour which was built to handle sugar exports in Bridgetown.

3. **Attitudes to the sugar industry** The long association of sugar with slavery in the Caribbean created a legacy of antipathy to the industry amongst black populations which is widely held to still be significant. Certainly attitudes to agriculture and to sugar cane production in particular are far from universally positive in Barbados today. This cultural aversion is frequently cited as underpinning a number of problems including labour shortages and the malicious setting of cane fires. In practice, however, while considerable antipathy certainly does exist, the extent to which this is simply a legacy of

slavery is perhaps debatable. On the one hand plantation work is often hard and unpleasant and would in all probability always prove to be unpopular. Equally it may be that pre-existing racial tensions effectively mask class structures which are, or at least are perceived to be, congruent with these. Indeed the planters, the government, the general public and academics such as Beckles all seem to conflate, inappropriately, race and class structures on the island.

4. **Labour costs/problems.** Almost all the planters interviewed claimed that rising labour costs have come to represent a major problem undermining the profitability and hence the sustainability of the industry. Labour costs do account for the majority of expenditure on plantations and sugar industry wages in Barbados are now significantly higher than those in many of its competitors industries (see fig. 6.11). As Booker Tate (1993, vol. 1:8) put it, "a major competitive disadvantage in Barbados is the high cost of labour. For example, labour rates tend to be over five times higher than in Jamaica".

Figure 6.11 **Agricultural wages in the Caribbean, 1992**

Average daily earnings in B$	Barbados	Jamaica	Guyana
Cane cutting	52	9	8
Field labourer	35	6	3
Skilled factory worker	72	13	5

Booker (1992, vol. 1:8)

In part, wages have also tended to rise in line with wages in other emerging sectors - notably tourism. Equally, however, current wages also reflect a strong union - a high percentage of both agricultural and factory workers are members of the Barbados Workers union. Barbados is a small island where the work force is easily and effectively unionised. The size of the island and the nature of sugar production are such that it is relatively easy to promote effective industrial action, e.g. at harvest on the plantations or in the sugar factories.

Overall wage costs have also undoubtedly been high because the vast majority of plantations maintained work forces well above those needed to produce sugar efficiently. Typically, there would be several levels of management on a relatively small plantation. Although this might have been appropriate 50 years ago it has become increasingly anachronistic in recent years. One

planter who has rationalised his work force outlined the situation in these terms:

> "Well, I'm doing the work that I used to employ five people to do and of those five people three got a living wage, for two of them it wasn't full-time work ..... I used to have a superintendent, an overseer, a manager, an accountant and an attorney. And now I do all these jobs myself" (personal communication).

Although many estates have remained 'over staffed', and whilst the planters complain bitterly about the high wages they are obliged to pay, there have nevertheless been considerable problems in recruiting labour in recent years. Workers have been imported from other islands and Guyana for several harvests. This situation has arisen despite high levels of unemployment in Barbados. Planters also claim that domestic workers do not work as hard or as well as they might. Several of the planters interviewed contended that foreign workers were more productive. As one planter suggested:

> "We used the Guyanese in 1990 and '91. They were very good workers, cut the cane very clean and nice. Our Bajan people don't really clean them as they should be cleaned. They were, you could see they were, specialist cane cutters .... those fellows loved to work here when they came. I found that those fellows would work every day - Monday to Sunday - they never wanted to stop. They came here to work for money and that's what they wanted. I found that they were very good workers. I still have one or two working for me" (personal communication).

Several factors may be significant here. A relatively high level of welfare provision may have lessened the necessity to take up this kind of work, which is extremely arduous. New job opportunities have developed in the tourist industry and other tertiary sector industries. There is also a widespread belief that the historical legacy of slavery has led to a general antipathy to working in agriculture in general and the sugar industry in particular. However, Barbados had little difficulty in recruiting workers from other parts of the Caribbean where slavery had also occurred when sufficient labour could not be found domestically. Whilst there may well be some truth in this, what seems to be more significant is the continuing existence of a white plantocracy.

Labour problems on Barbados have also been problematic because of the antagonistic and often adversarial relationship between the planters and the largely unionised workforce. Strikes have been common as have malicious cane fires. One planter illustrated his relationship with union in these terms:

"Two years ago I was at that time President of the Federation [the BSIL committee which negotiates with the Barbados Workers Union (BWU) which represents the majority of workers in the sugar industry], I'm Vice-President now. I asked for a year's moratorium on wages - they wouldn't give it to me. We fought and fought, we started the crop six weeks late, we had strike in the middle of the crop and we lost fifteen million (dollars worth of cane). One negotiating meeting I went to the head of the union who I was negotiating with and he told me that there was a cane fire at my place. I said you know its burning, would you go and put it out? But that's what they do, try to intimidate you. But you have to stand up to them" (personal communication).

5. **Inability or unwillingness to modernise efficiently.** Given the relatively high labour costs and labour problems experienced in Barbados it is perhaps surprising that more effort has not been put into adopting modern, labour extensive production techniques. All plantations on Barbados have adopted technology to some extent, all for example use mechanised cane loading equipment and some form of mechanised cane transport equipment. Between 40% and 50% of the harvesting is mechanised (Booker Tate, 1993, vol. 2).

However, a great deal of the technology which is present on the island is highly under-utilised - a feature which Booker Tate were highly critical of. Cane harvesters are extremely expensive pieces of equipment. Normally imported from Australia, such cutters cost something over US$250,000 in 1993. A number of plantations possess such harvesters which are only effectively used for two or three weeks during a five month harvest period. There has been little use of contractors or co-operation between plantations in the use of such equipment (Booker Tate, 1993, vol. 1). Some effort has also been made to develop a cheaper, smaller scale, single row harvester which would have been more appropriate to the scale of Barbados, but this initiative met with little success and has been abandoned.

In practice, several barriers exist to effective and efficient mechanisation. Modern sugar production technology is very expensive and represents a considerable investment which normally requires external financing. The topography of many traditional cane producing areas is such that it is difficult or impossible to mechanise sugar production effectively, particularly in respect of harvesting. One widely expressed, and probably partially valid, opinion as to why the industry has not adopted modern production techniques is that many plantation owners are 'conservative' by nature and resist change.

6. **Unwillingness to diversify.** Given the problems experienced in the sugar industry and Barbados' heavy dependence on food imports, a strategy of agricultural diversification, particularly the development of import substitution agriculture, would appear to be opportune in several respects. In fact, various official reports into the island's agricultural sector and successive National Development Plans have advocated such a strategy. Diversification would also appear to represent a sensible strategy for individual farmers. Agronomically it would alleviate some of the problems inherent in monocultural sugar cane production such as the build up of pests and diseases. Economically, it would provide a better cash flow and reduce the vulnerability engendered by dependence on a single source of income.

Whilst there has apparently been widespread agreement for some considerable time that diversification would be advantageous, relatively little progress has been made in this respect. Non-sugar agriculture has now become more important than sugar in terms of income generation, but almost 80% of the agricultural land remains in sugar and large amounts of food are still imported. In practice, much of the income generated in non-sugar agriculture comes from intensive livestock production, particularly of chickens and pigs (GOB, 1993).

Most sugar producers on Barbados do grow rotational crops within the sugar cycle, but for the most part these are the root crops - yams, sweet potatoes etc. - which have traditionally been produced and for which there is now only a very weak market. Relatively little progress has been made in introducing new crops. Most planters suggest that this reflects agronomic constraints. There may be some limited validity in this, but it would seem that a range of different crops could be produced. There are, however, other constraints. The domestic market for agricultural products is small, and much of this is accounted for by the tourist industry which requires not only particular high quality but also security of production both of which might well be difficult to obtain on the island. The small scale of the island also makes for particular difficulties in developing a processing sector which would produce greater value adding and higher returns to the producers. These problems aside, it is the case that many landowners have interests in the tourist and food importation industries and thus have little incentive to undermine their profitable interests in food importation.

Over and above the long-standing policy adopted by successive governments to promote agricultural diversification, there have also been specific government sponsored projects to promote specific crops. For the most part, however, these have met with little success. A recent venture to develop cotton production, for example, proved to be an expensive failure.

7. **Absentee owners.** Absentee owners have long been a problem in Barbados. Plantations without resident owners have typically under-performed those run which have been owner-managed (see, for example, Watts, 1987:352). In theory, attorneys should be in a position to achieve efficiency gains through integrating the operation of several properties. In practice however, several interviewees questioned the efficiency of this system. Attorneys were said to put their own properties first and to exploit other plantations in their charge, for example, by overcharging them for the use of the attorney's machinery.

Perhaps, more significant than this, however, is the highly influential role played by a very small number of attorneys. As suggested earlier, just 7 attorneys controlled some 63% of the arable acreage on plantations in 1988. Thus, this very small group have had the potential to exercise a considerable degree of control on the industry.

8. **Cost of inputs.** Almost all planters complain about the high cost and the low quality of inputs. Pesticides and fertilisers are said to be expensive and of dubious and unreliable quality. Particular concern is expressed over the cost of machinery and especially spares - which do appear to be inappropriately expensive.

The government, however, tends to suggest that most of the suppliers are closely linked with the plantation owners, either directly in that the ownership is the same, or through various informal networks. The corollary of this being that the planters are quite happy to make their money from these business interests rather than through sugar production *per se*. Not least because this arrangement facilitates a form of transfer pricing which allows the true profitability or otherwise of the plantations to be disguised and which thus can be used to substantiate the case for further government support for the industry. As one planter who was not a member of this group put it:

> "They were all right because they were some of the merchants in Bridgetown, and what they lost here they gained there. What you lose in the Lord's prayer you gain in bed" (personal communication).

9. **Agronomic problems.** Largely through a process of trial and error, the early planters on Barbados gradually developed a model of sugar cane agriculture, including for example the use of cane holes, which suited the particular environmental conditions found on the island. This traditional system was self-evidently sustainable in the sense that it allowed uninterrupted cane production for two or three hundred years. In recent years, however, a number of agronomic problems have emerged.

As with most forms of monocultural agriculture, sugar cane tends to be problematic in that various pests and diseases to which that crop is susceptible have the opportunity to develop over long and uninterrupted periods of time. In practice, new disease and pest resistant varieties of cane have to be adopted as established varieties periodically become increasingly less productive. Barbados has its own cane breeding station, and most people within the sugar industry there are reasonably satisfied with their work. Certainly new varieties have been developed to overcome diseases, such as smut, which have occurred in recent years.

Soil compaction is a major and widespread problem. In large part this is a consequence of mechanising various aspects of the production process. Even where cutting is still done by hand fields are ploughed using tractors and cut cane is mechanically loaded onto to some form of mechanised transport after cutting. Most observers suggest that although some degree of compaction may well be unavoidable, the situation is far worse than necessary because of a range of inappropriate practices in the use of machinery on many estates.

Soil erosion is a major problem in areas where sugar cane is no longer produced. The generally very thin soils of the island can be almost totally eroded during a single rainfall event if no adequate vegetation cover exists. Even where cane has been replaced with grass, slippage and other forms of soil movement are common. In the Scotland District, in particular, there have been severe problems of soil loss. Given the extreme vulnerability of Barbadian soils to erosion and the undulating topography of much of the island, it is perhaps somewhat curious that contour ploughing is not commonly practised in Barbados. Even on relatively steep slopes, up slope ploughing is the norm.

During the 1970s, controlled cane burning was introduced into Barbados in an attempt to address problems arising from the unregulated use of this practice. Although cane burning, which makes both mechanised and hand

cutting easier, has been used effectively in other locations such as Queensland, it proved to be highly problematic in Barbados. Both yields and sugar content fell dramatically during the period when controlled burning was used and the practice was soon abandoned in favour of a return to green cane. The major problem with cane burning was probably that the trash, or trimmed leaves from the cut cane, was not left on the ground. A trash blanket serves to prevent evaporation and maintain soil moisture content, and when it is subsequently incorporated it is beneficial in that it raises the organic content of the soil.

Maliciously set cane fires are, however, still a problem. Workers being paid on piece work rate perceive an obvious advantage in being able to cut burnt cane quicker than green and this may well account for some fires. On other occasions the motivation for setting fires appears to reflect the tensions which exist between planters and cutters rather than any direct gain by the workers.

Extension services have been available to planters and farmers from a variety of sources in Barbados including: the Ministry of Agriculture, BSIL and the island's sugar cane research station. Relations between the Ministry's extension workers and many planters have apparently not always been particularly propitious. This probably reflects the different agendas of the Ministry and the planters, with the former attempting to promote a more diversified pattern of agriculture and the planters, for whatever reasons, not wishing to do this.

Many extension workers argue that a large number of planters use inputs - fertilisers, pesticides and herbicides etc. - very inefficiently. Knowledge and understanding of these products is said to be low. For example it is suggested that planters will commonly mix different proprietary brands and indeed different types of pesticide together. There is also a widespread suggestion that many planters have a poor understanding of how their machinery should be used. There is some evidence that inappropriate farming practices have contributed to quite widespread problems such as soil compaction.

10. **Cost-price squeeze.** As profitability became compromised in the early 1980s most planters do appear to have economised on inputs. Certainly the most obvious and rational explanation for the quite dramatic fall in yields which has occurred during the 1980s would be a reduction in the inputs been used and the level of effort being put into cane production.

The most significant method of reducing short-term costs in sugar cane agriculture does not simply involve reducing the amounts of inputs such as fertiliser and pesticides used. With sugar cane there is a particular temptation to minimise short-term costs by ratooning for longer than the optimal period as this avoids expensive cultivation and replanting (Blume, 1985;75). An optimal ratoon length is usually three or four years, but it is possible to ratoon almost indefinitely. This saves the cost of cultivating but both the yields and sugar content of subsequent harvests will be lower and lower each year. Thus, given that the greatest cost involved in cane production is in the cultivation, planters can get something of a free ride for a number of years. But such a practice is not sustainable in the longer term, especially where extended ratoons are not properly fertilised (de Boer, 1994:4; Wickham *et al.*, 1990:6). And indeed it soon becomes unsustainable in the sense that it is unprofitable as returns fall below the costs of harvesting. Most respondents were unwilling to admit to cutting back severely on inputs or extending ratoons themselves, but most suggested that these practices were widespread amongst other producers.

To some extent, reducing expenditure appears to have been a reasonably rational response to the situation experienced in the early 1980s. As Booker Tate's manager pointed out, those planters who did try to maintain or indeed increase their output in order to offset falling prices rapidly found themselves in serious financial problems:

> "Many of the people who went bankrupt first are those that tried desperately to maintain production, to replant their fields and to keep the industry going. They were the first to go under, to get bankrupt" (personal communication).

11. **Tragedy of the commons.** According to Booker Tate, the development of the crisis reflected a divergence between the individual and collective interests of the planters and the sugar industry as a whole:

> "As an individual farm you could stay alive and run everything down without getting into serious debt, but if many of you do that you destroy the whole industry and that in a way is what happened. The production fell and the costs of the remaining output increased ... it was a vicious circle" (personal communication, Manager, Booker Tate).

Thus in something akin to a 'tragedy of the commons' situation, individually rational responses to problems proved to be collectively damaging. That said, whilst individual land owners certainly did adopt strategies defined by their

own interests, and while these did contribute to the progressive crisis within the industry, it may well be that these strategies reflected individual interests which extended beyond the agricultural sector *per se*.

12. **Loss of motivation by planters.** A large number of interviewees suggested that the problems of the sugar industry in Barbados have been compounded by a widespread belief that the industry has no real future. Thus planters are not motivated to invest in their properties or even to make any real effort to farm efficiently. As one planter and attorney put it:

> "The manager walks out in the morning and he knows that whatever he does its a loss position. That's very demoralising. If he weeds, if he fertilises, its a loss position. And particularly if when he wants these things he cannot get them because there aint the money from the bank" (personal communication).

The problem here is not simply that it is difficult to remain viable in the short term. The more perceptive planters, at least, are all too aware that the future of the ACP agreement is highly uncertain and that this is likely to have very profound consequence for the island's sugar industry. In practice, what seems to have happened is that many planters have adopted strategies which go some way beyond the passive response of not investing in their sugar interests and have apparently been positively removing as much capital from the plantations as possible and reinvesting this elsewhere.

13. **Development gain, ineffective planning controls.** Throughout much of the post independence period considerable amounts of money have been made from development gain as, often high grade, agricultural land has been turned into housing and tourist related developments. Apparently, this has dissuaded many planters from investing in sugar or being particularly concerned with developing their sugar interests as they intend to change the use of their land at the earliest opportunity. There has been quite considerable speculation in land related to the possibility of development gain.

In theory, the GOB has quite comprehensive development control powers (Griffith, 1996). In practice, these have proved to be largely ineffectual (Carnegie, 1996). Most commonly, planning permission refused at normal levels has been granted under ministerial review. Accusations of corruption are widespread and appear to be not without some substance. However, what tends to occur is perhaps something less than corruption in the most literal sense of the term. In part the situation is confused by the fact that a large

number of plantations are owned by individuals or companies with interests in the tourism, construction and retailing industries. In practice, patterns of individual and corporate ownership are complex and often involve senior political figures as well as landed interests. Thus development gain may well involve indirect gains by individuals involved in the development process rather than bribery *per se*.

To some extent the GOB appears to implicitly defend development gain as a legitimate objective through its claims that the current high level of debt owed to the BNB can be effectively expunged through the sale of further land for development. According to one eminent Barbadian politician:

> "The Barbadian government has the capacity to recover that $200m at any time it wants to by the simple stroke of the pen allowing sub-division of some of the land that is now in sugar. And it moves the value of land from $2,000 or $3,000 to $10,000, so divide this by $200m and you will understand. There is a golf project, 400 acres of Westmoreland Plantation in St James, that has permission to develop. They claim that the receipts from this is going to be $600m. And Barbados has no capital gains tax and we don't have a development tax in the sense that you have it other countries" (personal communication, former Prime Minister of Barbados).

14. **Movement of capital out of sugar.** As profitability in the sugar industry became compromised and new investment opportunities have emerged during the 1970s and 1980s, there appears to have been considerable movement of capital out of sugar into these other sectors. Accordingly, there has been under-investment in the sugar industry. Moreover, the government claim that much of the support afforded the sugar sector has passed straight through the industry to be reinvested elsewhere. There is considerable circumstantial evidence to support this contention. It is also widely suggested that money is not only invested in other sectors of the Barbadian economy but that much is exported to 'safer' locations such as the US and Europe. A former chief agricultural director in the Caribbean Development Bank summarised the situation in these terms:

> "There were many years in which sugar would show a modest profit, sometimes no profit at all, but the subsidiaries were making considerable profits. Take for example the question of inputs into the sugar industry. The sugar industry should have been getting its own inputs - tractors and fertilisers etc. - but instead of that companies were set up - Plantations Ltd., for example, the very name tells you. This was a company originally set up to deal in inputs for sugar. There were other organisations to deal with the storage and shipment of sugar after it was manufactured in the factory. All of this, in my view, should have been part of the industry. But these were siphoned off, but the same persons who

ran the sugar industry actually ran these places as well, but they weren't part of sugar ..... the money that was being made out of sugar in those days was not being made out of crystals of sugar. All of these things were part of it and that was part of the problem" (personal communication).

Similarly, a former Prime Minister of Barbados, and perhaps significantly one whose family have considerable interests in the sugar sector, suggested:

"That is a fact. There is no question about it, the merchants were dependant on the sugar industry up until the rise of tourism in the 1950s, 60s and 70s. From 1976 on tourism became a very important factor. It grew faster than sugar and as tourism expanded sugar declined. Some of the planters put money into the hotel industry ..... In my opinion they could have carried out the reorganisation of BSIL in the 60s, but its a fact that there were influences within BSIL which were dominant, which predominated, because they also had a merchant interest, that's a fact. You have to look at these things together. There were a lot of concurrent causes" (personal communication).

When asked if some people in the sugar industry were 'purposeful and objective in taking money out of the industry' one senior member of the Barbadian government suggested that:

"I would confirm that is my impression. They used the system .... in terms of business you could not call it illegal. If I can get money on soft terms and repay part of it and have the use of the rest of it, you see a lot of them used the moneys, they invested in other business activities and in some instances it was said they educated their children at the expense of the sugar industry" (personal communication, Barbados Minister of Housing, Land and Environment).

The mechanisms through which money was allegedly transferred out of the plantations is also well known. Receipts for sugar cannot be disguised, but income from non-sugar crops is almost exclusively in cash. Thus all inputs to the plantations whether these were for sugar or non-sugar crops were charged to the plantation, but cash income from non-sugar crops was habitually not accounted for. As Barbados' Overseas Trade Commissioner suggested:

"My reading of the situation is this - after they saw the problems and realised that things were maybe not working according to plan, what has been happening, and I'm very adamant about this, they were planting other crops and filtering .... this is very important. Under the Sugar Act, non-sugar crops, the revenue from non-sugar crops was never taken, but the expenses were, and the expenses were passed on against the background of sugar. When you put in a new crop, and you inter-plant onions or those other things the manure was for the canes and not for those other things. It was classed as an expenditure for sugar, but when the crops were reaped the revenue did not go where it should, it went elsewhere ..... the labour cost on non-sugar crops is not accounted for, the

labour cost goes to sugar, it goes against the expenditure for sugar while the profit goes straight into the pocket" (Personal communication, senior official within the Barbados Ministry of Agriculture).

Many of the planters also have interests in functionally linked commercial interests and a system of transfer pricing allowed the real profitability of the plantations to be disguised. As one member of the Barbadian government put it:

> "What you should check is the relationship between the sugar industry in Barbados and Plantations Ltd and Barbados shipping and trading. You have a relationship where the sugar industry was on almost all occasions making a loss, but the suppliers of chemicals and fertilisers were making a big profit." (Personal communication, Barbados Minister of Trade).

The potential for planters to engage in creative accounting of the nature suggested, is in part at least, facilitated by the limited compass of the Regulatory system on the island. Barbados law does not require privately owned businesses with a turnover of less than B$1m to prepare full accounts and as most plantations fall within this category, hard evidence of the real accounts of these properties is almost certainly impossible to obtain.

15. **Poor government.** Given the nature of sugar production, there is an obvious need for some degree of regulation if only to co-ordinate the agricultural and industrial sectors of the industry. Various other factors including both environmental and economic risk and uncertainly, the interdependencies which exist between the sugar industry and the environment and the need for various forms of external support also militate strongly for regulation.

Although some regulatory functions have been vested in other bodies, for example BSIL, the GOB has been and remains the locus of most regulation formulated and enacted within the island. In practice, much of the regulatory framework which influences the Barbadian sugar industry is effectively external to the island, consider for example the ACP agreement and any changes which the EU may wish to bring about. Equally, it is clear that the Barbadian sugar industry is affected by elements of the mode of social regulation existing in Barbados which are not directly related to this sector. Consider, for example, the effects which the development of even a rudimentary welfare state on the island have had with respect to labour recruitment in the agricultural sector. Thus whilst the GOB remains the locus

of most of the regulation which is formulated around the sugar sector, its potential and scope are necessarily highly selective, constrained and far from comprehensive.

Many of the planters are openly critical of the government in Barbados. All post independence governments have been broadly socialist (the two main political parties in Barbados are both 'Labour' parties). Thus most planters are not sympathetic to the general ethos of policy. But over and above this, the planter community also tends to be highly critical of the competence of most members of government.

16. **Debt.** In the first and last instance, most if not all plantations in Barbados which have become dysfunctional have done so as a direct result of high levels of debt. Whatever other problems the plantations may have had, it has been their inability to operate at a profit and thus to service their debts, which had made them unsustainable. Again, however, the situation may not be quite so straightforward as it at first might appear. As a former chairman of the BADC pointed out:

> "I can remember one plantation which had not made money for something like ten or eleven years, it lost money every year ..... well I got a white, young Barbadian who I felt knew what he was doing and who owned his own equipment and we got on with the job. We took that plantation, it was gone to pot, and in the first year after planting we made a profit" (personal communication, former Chief Agricultural Officer, Barbados Ministry of Agriculture; former Agricultural Director Caribbean Development Bank).

17. **Conspiracy theories.** Many members of the planter community argue strongly that the whole system of support provided for the sugar industry during the 1980s constituted a strategy by the GOB to encourage planters to over-extend themselves and thus to allow the state to appropriate the land. Certainly loans were made well beyond any reasonable banking criteria and there was never any realistic chance of them being serviced or repaid. And in practice at least half of the plantations found themselves grossly over-extended with no hope of servicing their debts to the BNB. As one planter and attorney put it:

> "They want to take over the whole thing. But why? I don't think they can manage my estate better than I can. And what am I going to do - sit on my arse? They are screwing me now ..... I think that in another couple of years it will be just like Rhodesia. They'll have chased every white farmer out. And then when they thing goes to hell, it will be the same as with Mugabe or whatever his name is,

they'll have to beg them to come back. It will happen" (personal communication).

However, the conditions under which the loans were granted did not allow the government to foreclose on the mortgages in the normal sense. Accordingly, although many plantations have been unable, or unwilling, to service their very high levels of debt, their estates have only been leased by the GOB. The planters retain the option to regain control of the properties at the end of this period. One planter considered that this situation simply reflected the incompetence of the bank:

> "If you are so foolish to do what the bank (BNB) did which was to take out mortgages which did not give them the right to force the sale of the land, you'll never get your money back. Under that sort of business practice you're damned foolish, and that's what the bank has done. The bank got a mortgage which did not authorise them to sell off the property and they can't get their money back. and the bank ought to be bankrupt, under normal business practice they would be bankrupt" (personal communication).

In reality, however, the leasing arrangement appears to undermine the suggestion that government support for the industry during the 1980s was part of a strategy to disenfranchise the planter community. This theory is also fundamentally negated by the fact that much of the money loaned to the planters by the BNB was never invested in the sugar sector. Had it in fact been used as it was intended, or perhaps more accurately if less had been borrowed, it is highly probable that far fewer plantations would have become as indebted as they did.

The government theory is based on a contention that the planter community has quite objectively extracted as much support from the government as possible and then effectively expropriated much of the money ostensibly provided to support the sugar industry and used it for their personal benefit. There is considerable circumstantial evidence to suggest at least a degree of truth in this type of suggestion.

Senior members of both major political parties are quite overt and unequivocal in suggesting that the planter community has objectively sought, gained and subsequently misappropriated government money. As one Minister in the Barbadian government suggested:

> " They don't look as if they are bankrupt, and surely they are not. And as for those who appear to be bankrupt don't ever look at that either - that's only for show - rather than showing it off you hide it. They're still in control of 80% of the land" (personal communication, Barbados Minister of Trade).

The level of borrowing and debt accrued by many plantations appears to be well in excess of any figure which might have been accounted for by operational expenditure during the period in which the loans were granted - typically B$2.5m (US$ 1m) per HIP over a period of less than 10 years, or more than B$250,000 per year. Such figures are particularly difficult to account for given the fact that Booker Tate found virtually no assets - machinery, etc. - on these properties,

With little investment having been made on machinery etc. during the 1980s, the only major expenditure of the plantations was on wages, which normally account for about 60% of total outgoings. But this level of expenditure does not equate with the amount of borrowings which occurred. A typical plantation, employing ten full time labourers earning a maximum of B$10,000 per year would have a wages bill for these workers amounting to B$100,000 per year. If a further ten workers were employed for the three months of the harvest this would add another B$25,000. If we add to this national insurance payments etc., it seems unlikely that the total yearly wage bill for a typical plantation could be more than $150,000. Given that virtually no major purchases were made during this time, a generous estimate of other operational expenditures would be B$100,000 per annum. This would give a total yearly expenditure of B$250,000. Over a ten year period this would amount to B$2.5 million, or roughly the figure which many plantations owe the BNB. Interest on these debts was capped at a maximum of 8%, and even if we allow for the effect this would have, it is difficult to see how all of the borrowings could have been used to finance legitimate agricultural expenditure on the plantations. Balancing debt and apparent outgoings requires that these estates had virtually no income during these ten or so years and this simply is not the case. Most estates, whilst prices for their sugar may have been reduced for a period in the early 1980s, continued to produce sugar and to get paid for it. Most estates also produced some non-sugar crops, the incomes from which were not so affected by the currency problems.

6.8 **From sustainability to unsustainability**

There are then many possible explanations for the decline of the Barbados sugar industry. It may well be that the majority of these explanations are, in some sense, reasonable and accurate. What seems clear, however, is that

specific technical explanations based on physical, agronomic or even labour supply problems are not, in themselves, complete explanations for either the demise of the sugar industry or for the range of 'unsustainable' events which have accompanied this. A more complete and powerful form of explanation needs to incorporate an understanding of (a) the external context in which the Barbadian sugar industry has operated and (b) the ways in which the unsustainability of the island's social structures have underpinned not only the collapse of the sugar industry, but also many of the more material and morally unacceptable forms of unsustainability which have come about.

Context

The problems of the sugar industry in Barbados have to be understood and interpreted in terms of the guaranteed markets and the system of preferential prices within which the industry operates. The main quota is for 54,000 tonnes of sugar into the EU and the price which Barbados receives for this sugar is effectively determined by the 'A quota' price for European beet sugar. This averaged 27 US cents per pound in the 1980s whereas the world market price for sugar averaged about 10 US cents per pound throughout this period. Thus Barbados received a premium of around 150% for its sugar exports during the 1980s. And, the problems created by the 1981 currency fluctuations aside, Barbados has not been exposed to the extreme price volatility which typifies the international sugar market. It has enjoyed guaranteed markets and extremely preferential prices for virtually all the sugar it could produce. Even within this context, however, the industry has proven to be increasingly unsustainable.

In fact, the effectively stable conditions provided by Barbados' position within the ACP agreement defines a potentially useful context within which the 'unsustainability' of the island's sugar industry can be understood. If we accept that the markets and the income for Barbados' sugar have, for the most part at least, remained stable throughout the 1980s, it surely follows that the crisis which developed reflected internally generated tensions and contradictions rather than any externally produced changes in the context within which the industry operates. In itself, this may well be a highly significant commentary on the nature of sustainable development and the ways in which it might be achieved. Not least because it suggests that the

unsustainability of development in Southern countries cannot be fully explained in terms of uneven development at a global level.

Inefficiency as a cause of unsustainability

To some extent, the current crisis in the Barbadian sugar industry can be explained in terms of the comparative disadvantages faced by Barbados and by the technical inefficiencies which have typified the sugar industry there. Although well suited to traditional production methods, several features of the Barbadian physical environment are not particularly appropriate for modern methods. Some of these problems, such as small fields, could be overcome, others such as the sometimes unfortunate topography are essentially fixed. But these physical difficulties provide only a partial explanation of the current crisis, especially given the very advantageous context in which the sugar has been marketed. Certainly, the 'modernisation' of the Barbados sugar industry was never accomplished in a particularly effective manner, and current inefficiencies may well have served to prejudice the profitability of the industry. But it is far from clear that these have been sufficient to render the industry economically inviable given the preferential prices received for the island's sugar. Moreover, if the substance of the crisis is falling output, technical inefficiencies in the production system cannot be the cause *per se*. What was essentially the same system produced almost four times as much sugar as that now being achieved 25 years ago. That said, these inefficiencies may have served to make the industry relatively less profitable than alternative economic activities, and this may well have been significant.

A similar argument pertains to role problems of labour supply and costs. It is widely argued in Barbados that the problems of ensuring an adequate labour supply have constituted a major factor in the industry's recent crisis. Clearly conditions have changed and the more direct forms of control and coercion adopted in the past are no longer tenable. But it is far from clear whether problems of ensuring adequate labour supplies can fully explain the sugar industries problems. It is, however, important to appreciate that little which happens in Barbados can be properly understood outside the context of the racial and class based tensions which pervade Barbadian society. It is, for example, difficult to explain why such problems were experienced in recruiting agricultural labour during periods of high unemployment on the island. Certainly it appears that the problems reflected something more than the unpleasantness of the work or the wage rates available. Indeed many of the

labour problems experienced stemmed from the extremely poor relations which existed between the planters and the workers and the union rather than from any specific and material grievances regarding either pay or working conditions. Moreover in practice, the problems experienced in obtaining labour supplies on the island did not prove to be insurmountable, labour was obtained from abroad when necessary. And beyond this, had the plantations adopted more modern production systems the need for labour would, in any event, have been drastically reduced. Certainly sugar cane is grown in Queensland with virtually no non-family labour being employed.

The extent to which the unsustainability of the Barbadian sugar industry can be blamed on operational inefficiencies is then somewhat debatable. What is apparent, however, is that technically at least many of these inefficiencies could have been addressed. Indeed efforts are now being made to address them - Booker Tate's restructuring programme is founded on such measures. In theory, it is relatively straightforward to see how the industry could be made much more profitable than it has been. Large savings in labour costs could be achieved relatively easily, consolidation of production units and the more efficient use of expensive machinery and rationalisation of the milling sector are all obvious possibilities. Certainly cane sugar industries in other parts of the world, including developing countries such as Thailand, have been able to become progressively more 'efficient'. That said, however, a constant requirement for incremental efficiency gains, necessary it seems within a competitive capitalist economy (and indeed seemingly equally necessary in the protected situation of the Barbadian sugar economy), hardly seems to be compatible with the idea of sustainable development. Certainly it is clear that such gains can not be achieved indefinitely. Thus in so much as particular economic activities apparently face constant pressures to address declining profitability through whatever means are available, it might well be argued that the conditions which necessitate this incessant process of restructuring are fundamentally incompatible with the achievement of sustainable development.

As they themselves acknowledge, Booker Tate are very unlikely to be successful in restructuring the Barbadian sugar industry in a way which will allow it to become sustainable. The need for more efficient production methods has been apparent for decades and little progress has been made. Booker Tate will need to overcome the same barriers to change and rationalisation which have prevented it from occurring more spontaneously in

the past. It seems unlikely that they, or for that matter the Barbadian government, will have either the resources or the powers to overcome these barriers and ensure a viable industry.

In practice a range of often related problems has served to prejudice the profitability of the Barbados sugar industry Hudson, 1990). Whether these problems, either singularly or in total, have been sufficient in themselves to cause the collapse of the industry is at best unclear. What is more clear, however, is that in themselves these explanations offer only a partial picture of what has occurred on Barbados. Any convincing explanation of the causes of 'unsustainability' in the Barbados sugar industry requires that these direct causes of the industry's unsustainability be understood in the context of the social and political structures which exist on the island.

'The Merchant-planter elite'

Developments in the Barbadian sugar industry and in other sectors of the Barbadian economy cannot be adequately understood outside the context of the class and racial structures which prevail on the island. The direct political power of the 'plantocracy' has been gradually eroded during the twentieth century as the franchise has been extended, and ultimately with independence and universal suffrage. However, the indirect power held by what Beckles (1990) terms the 'merchant-planter elite' apparently remains. As direct political control over the island slipped away from the planter class, this group was able to extend its commercial interests in Bridgetown. Companies such as Plantations Company Limited and Barbados Shipping and Trading have for some time not only owned large land holdings but also controlled companies involved in retailing, importing, and in a range of other sectors including tourism. According to Beckles (1990:162), "the presence of these two corporations - Plantations Ltd. and BS&T - signalled the origins of monopoly capitalism in Barbados, and the final stage in the successful economic domination of the colony by the merchant class". Plantations Ltd. became bankrupt during the early 1990s and some of its assets, including six sugar estates, have been acquired by a large Caribbean based insurance company: the Caribbean Life Insurance Company (CLICO). BS&T remains the largest company in Barbados.

One Minister in the Barbadian government outlined his appreciation of the role played by the 'merchant-planter elite' in these terms:

> "They have been able to buy these hotels and other kinds of investment and are trying to hold their control over the country - over successive governments. They have been trying to hold that tight rein of control. While the government is looking for political enfranchisement for all, the economic enfranchisement remains with the former group to this day. How do you maintain that? That's the question you should ask, how do you maintain that grip? You have to dig and dig and dig till you get right down to the truth ..... its a subtle thing" (personal communication, Barbados Overseas Trade Commissioner).

Another member of the Barbadian government commented in these terms:

> "There was a group known as the 'big six' at one time. They were into sugar mainly, and they were into commission agencies in Bridgetown, and then they got into retailing activities, but none of them in those days ever got into any manufacturing. It was strange. We were here, government - political parties of both sides, pushing the idea of more manufacturing activities but they never got into this. They got into importing motor cars, owning garages - a quick, fast turn around. And they had a stranglehold on the import of everything under the sun which was brought into Barbados, and that is what it was. Their interests extended both ways, they had all the economic power" (personal communication, Barbados Minister of Housing, Land and Environment).

In practice, the true economic and political influence of the 'merchant-planter elite' is extremely difficult to quantify. For the most part, determining the diverse and extensive interests of companies such as BS&T is a relatively straightforward exercise, but cataloguing the interests and business relationships of the elite class as a whole is highly problematic. Their interests tend to be manifold and convoluted and their relationships with other businesses and other members of the plantocracy are often informal and arcane. Moreover, the nature of the relationship which exists between the merchant planter-elite and the government is not as clear cut as some commentators would suggest. Academics such as Beckles and, in public at least, most Barbadian governments have often been overtly and vehemently critical of the merchant-planter elite and the ways in which they have used their economic and political power to the disadvantage of the majority of the population on the island. For example, Beckles accounts for the continued government subsidy of the sugar industry in these terms:

> "I think that the benefits have been unevenly distributed ..... the money has not been used to generate the kind of social benefits we need. What it has done is to prop up and maintain the survival of the plantocracy. I do not think that the plantocracy or any ruling

> class should survive on the basis of the plantation. And when you investigate the expenditure patterns of the plantocracy what you find is a tremendous amount of conspicuous consumption. And that conspicuous consumption can only be maintained by the basis of subsidy. They have their holidays in New York, their big fancy yachts, their racehorses and they play their polo, a super privileged lifestyle. That's fine if they earn it, but if they do it on somebody else's earnings there is something immoral about that. But the governments of the last thirty years have been unwilling, or perhaps afraid, to confront this class and say this is the end of the line. This government is the first to say no more subsidies and there has been an awfully violent reaction to that" (personal communication).

The suggestion is that this small community is powerful enough to effectively subvert the political process. In practice, whilst political rhetoric is invariably populist, the reality is that this elite does appear to be extremely effective in promoting its own interests. On the one hand, corruption, for example within the development control process, is widely accepted as being the norm. However, the most significant issue may not be corruption *per se*, but rather the way in which the political agenda and the regulation of commercial activity is constructed to facilitate the interests of the plantocracy. As one government minister suggested when questioned about any tensions between government and the plantocracy:

> "What I know is that there were stages at which government's actions were constrained .... its options were perhaps limited, but government never sought to control the activities of the private sector .... except in more recent times when the central bankers had to restrain commercial activities because of the slippage of foreign exchange .... there has never been any confrontation .... the government has never had an adversarial relationship with them except in more recent times through the structural adjustment programme .... what I am in fact basically saying is that none of the Ministers of Agriculture, apart from me, have ever had a confrontation with the sugar industry as far as I am aware. I was the first one that shouted out and I don't think they liked it." (Personal communication).

This may go some way in explaining why despite years of rhetoric little real progress has been made in diversifying the agricultural sector. BS&T, for example, not only own significant amounts of sugar land (and its major shareholders own even more), but also dominate food imports and retailing.

When explanations of the sugar industry crisis in Barbados are extended beyond purely technical matters, they tend to be polarised around the positions adopted by the government and the plantocracy, both of which interpretations are formulated around racial tensions on the island. In practice, racial and class issues are often conflated with what may well be

class tensions being interpreted in purely racial terms. As one Barbadian put it:

> "I used to work as a sugar chemist at a sugar factory here, and I heard the owner who was a white man arguing downstairs with a fellow and saying 'now you just a nigger, now you just a nigger'. And I've heard him phone Cave Shepherd and ask for some shoes and when he couldn't get any he turned to me and said 'those blasted baccra bitches'. Where they use nigger for the blacks they use baccra for the whites. They use one word for blacks another for whites" (personal communication, former Chief Agricultural Officer, Barbados Ministry of Agriculture).

Certainly, the situation is far more complex than some commentators suggest. There is a significant black middle class, especially in the professions. Some black politicians have extensive commercial and landed interests. An increasingly large area of land is owned by blacks and has been for some time. The majority of HIPs are in fact owned by blacks. New commercial interests such as CARICO which has been acquiring land on Barbados are not controlled by the Barbadian planter class.

The unsustainability of the plantation system in Barbados is in itself merely a reflection of the unsustainability of a system of social relations which is a relic of seventeenth and eighteenth century colonialism. And here lies the basis of a much wider and much more meaningful set of unsustainable practices and events on the island. In present day Barbados there remains an elite class whose position became so fundamentally and clearly insecure that its members could not help but to be aware of their vulnerability. Within the constraints of bounded rationality, this group has striven to maintain its position - its wealth and privilege - in whatever ways it understands to be possible. To achieve this it has sought to maintain the effectiveness and viability of its economic base. And it has done this with a consummate disregard for the social and environmental consequences of its actions. Understanding how and why an increasingly incongruous and dysfunctional pattern of social relations has persisted for so long is centrally important to understanding the recent history of Barbados, and it may be centrally important to understanding the causality of a whole range of unsustainable practices and events which have occurred on the island.

Although the origins of the present day elite are clearly located within the plantocracy, this term has become increasingly inappropriate. Beckles' use of the term 'merchant planter elite' reflects a long standing and now well established diversification from purely landed interests. This process of

diversification has continued and intensified to the point where land ownership is no longer the basis of class differentiation and power on the island. Moreover, this elite group is no longer formulated around the strict racial divisions which defined it in the past, and indeed its activities are now partially obscured by often inaccurate racially determined perceptions of events. An obfuscation which is almost certainly quite useful to some of those involved. The successors of the plantocracy are now more properly seen as a more purely economic elite. An elite whose position appears to have remained intact despite a whole range of antithetical and potentially damaging developments. Particularly surprising perhaps given the process of declining profitability which has apparently occurred within the sugar industry.

It is perhaps useful here to consider more closely the size and composition of the present day elite. Clearly this is no longer either synonymous with the planter community or defined by purely racial criteria. A number of black Barbadians are now important actors within this group. And equally it is no longer correct to consider land ownership as a primary requirement of elite status. A number of plantations have for some time been owned by black Barbadians, although it is not clear to what extent these individuals have been assimilated into the elite group.

In practice, it appears that a number of plantation owners have been effectively excluded from the new elite community and this group appears to have been as disadvantaged by recent events as has the rest of Barbadian society. This may reflect the fact that there has been a large turnover in plantation ownership in recent years, engendered perhaps by the newly formed strategies of the elite. Equally, it may be that inclusion within this group has always necessitated something more than plantation ownership. Certainly as the significance of land ownership has declined and new economic activities have gained the ascendancy, new criteria seem to have emerged for accession. Although the very nature of this group means that it is difficult to ascertain its precise composition with any great certainty, the evidence suggests that it now includes leading figures within the tourist and construction industries, commerce and the financial sector. In all probability most post-independence politicians have never been included within this group. There may well have been some exceptions and boundaries may have been fuzzy and when necessary elastic, but the power of this group has had an economic rather than a political basis. That is not to say, however, that economic power has not been sufficient to allow a high degree of control over the political agenda on the island.

The incidentally unsustainable

The decline of the Barbadian sugar industry has been accompanied by a range of other 'unsustainable' practices and events such as accelerated soil erosion and negative impacts on the island's hydrological system. Many of these events appear to be directly related to what has occurred in the sugar industry. In this sense, understanding the causality of the decline in the sugar industry informs our understanding of why these forms of unsustainability have occurred. For example, extended ratooning which has been quite widely practised in recent years depletes soil nutrients, damages soil structure and can eventually result in massive soil loss (de Boer, 1994:4; Wickham *et al.*, 1990:6; Hudson, 1990:4; Walker and Simmonds, 1981). From this perspective, the causes of the soil loss involve the same factors which have underpinned the collapse of the sugar industry.

6.9 **Summary**

The Barbadian sugar industry which started to decline some twenty years ago has now entered a period of crisis and seems likely to collapse completely. This unsustainability is particularly difficult to explain given the high degree of protection and support afforded the industry in recent years. The process of decline in the sugar industry appears to have produced a range of other environmentally, socially and morally unsustainable practices and events. Within all of this, however, the elite group on the island appear to have been successful in sustaining their own privileged position.

Direct explanations abound for why the Barbadian sugar industry has declined. Whilst these may well be sensible in themselves, they seem to be inadequate to fully explain what has occurred. A more convincing explanation needs to delve beneath surface level appearances to uncover the deeper causal mechanisms involved and the institutional and social context in which they have operated. The unsustainability of the plantation system and threats to the status of the island's elite social group appear to be significant causal factors influencing both the decline of the sugar industry and the promotion of other forms of unsustainability. Chapter 7 of this thesis will attempt to develop a multi-level, realist, explanation for what has occurred. Such a mode of explanation potentially represents a powerful basis for understanding not only the reasons why the Barbadian sugar industry has collapsed, but also how this event has been implicated in a range of other unsustainable outcomes.

Chapter 7. **BARBADOS: INTERPRETATION AND ANALYSIS**

This chapter provides a deeper analysis of 'unsustainable events' in and around the Barbadian sugar industry. The chapter begins by considering a range of explanations which might account for the collapse of the sugar industry and goes on to discuss the significance of the unsustainability inherent in the plantation system and the pattern of social relations on the island. Consideration is then given to how this unsustainability is related to a range of other unsustainable outcomes. The discussion focuses on the strategies which have been adopted by the island's elite group to sustain their own status and privilege and the institutional and social context which has legitimated and empowered these strategies. The final section of the chapter attempts to interpret development in Barbados in explicitly realist terms using the methodological approach outlined in chapters 2 and 4 of this thesis.

7.1 **An unsustainable industry**

Sugar has been produced on Barbados for over three hundred years. Thus in one sense, albeit a very narrow one, sugar production has demonstrably been a sustainable activity on the island (Watts, 1987). And, other things being equal, it would seem reasonable to assume that if this activity was sustainable for a period as long as this it could be sustained indefinitely. Clearly, however, such an assumption would be fallacious as the Barbadian sugar industry is now anything but sustainable (Drummond and Marsden, 1995b).

Neo-liberal approaches to sustainable development would suggest that the collapse of an industry such as the Barbadian sugar industry may be a positive development in that it clears the way for new, more profitable and more productive activities to emerge. Development is perhaps necessarily dynamic and within this it may be that particular industries will inevitably become inappropriate and unsustainable. And thus in practice, it may well be that the Barbadian sugar industry's day is done and the island and its people will be better off without it. From this perspective, it would be wrong to sustain an unprofitable industry artificially, for example through subsidies, because this would encourage a sub-optimal pattern of development. Certainly this is the position now taken by the IMF in Barbados. In practice, however, it is far from clear whether this neo-liberal perspective and the approach to sustainable development which it defines possess any real legitimacy. The Barbados case certainly suggests that the implications of this type of approach

are more subtle, more wide-ranging and more uncertain than is sometimes claimed.

The Barbadian experience clearly demonstrates that the demise of a particular industry cannot necessarily be evaluated and addressed as a singular, discrete event. In practice, the decline of the Barbados sugar industry has been closely associated with a range of environmentally degrading and socially unfortunate impacts. These include: accelerated soil erosion; potentially negative effects on the island's hydrology which may well severely prejudice water supply security; increased unemployment; a reduction in much needed foreign exchange earnings; and the misappropriation of capital needed for the wider development of the island. On the one hand the restructuring process associated with the collapse of an established industry is itself almost inevitably going to be traumatic as traditional livelihoods, conventional land uses, established communities all become redundant. It is always going to be likely that both people and the environment will tend to suffer during such events. And what the Barbados case shows is that relict industries will not necessarily be replaced by new and more productive economic activities in the same locations. Over and above this however, the Barbadian case would seem to suggest that the process of decline which preempts the final collapse of a particular industry may well tend to produce a range of unsustainable outcomes which extend beyond those involved in the collapse of the industry itself. Unsustainable outcomes which, in this case at least, appear to have been the more or less direct results of attempts to address particular consequences of decline within the sugar industry. Or more succinctly, outcomes which are the result of particular actors or groups attempting to safeguard their own positions by adopting strategies purposively designed to protect extant capitals and class structures - the incidental consequences of which tend to be a range of degrading and destructive events. Understanding the causality of such unsustainable outcomes in a way which incorporates the whole range of causal factors involved may be crucial to the achievement of sustainable development. Such an understanding requires an appreciation of the objects and structures which give rise to the tendencies involved and the processes and mechanisms which produce their realisation. Also particularly important here are the institutional and social conditions which legitimate and empower the mechanisms involved. If unsustainable outcomes are to be avoided, it is vitally important to understand how modes of social regulation 'activate' causal mechanisms and thus allow unsustainable outcomes to be realised.

7.2 **From sustainability to unsustainability**

The collapse of the Barbadian sugar industry cannot be directly explained in terms of a changed external context which has prejudiced the viability of the industry. The global sugar economy is certainly a volatile and hostile environment, but Barbados has scarcely been exposed to this. The ACP agreement which has provided a guaranteed market and preferential prices has effectively cocooned the Barbadian sugar industry, shielding it from external problems. The price shock of the early 1980s was just that; a shock, but hardly sufficient to fully explain subsequent events. In this sense, the Barbados situation is analogous to an experiment where the conditions have been simplified by the exclusion of certain factors. The key exceptions to this may be the uncertainty which surrounds the future of the ACP agreement and the indirect effects which Barbados' incorporation within an increasingly globalised food production system have had for non-sugar agriculture on the island. These factors aside, the effective exclusion of external determinants of the sugar industry's unsustainability suggests that the causes of the current problems are in large part endogenous rather than simply imposed from abroad.

Moreover, given that sugar production had been sustained for so long on Barbados, there is no reason to suppose that such production could not continue on the island because of environmental or ecological problems or for that matter because of purely agronomic reasons. Indeed it would seem that the reverse is what has occurred, rather than ecological or agronomic problems causing the collapse of the sugar industry, the collapse of the industry has been instrumental in promoting a range of environmental and ecological problems.

From this perspective, it soon becomes apparent that the plantation system and the class structures which accompany it are themselves unsustainable and that this unsustainability has been a significant causal factor underpinning both the collapse of the sugar industry and a range of other unsustainable events on the island. Even a cursory examination of recent events in Barbados reveals that the dysfunctionality and unsustainability of this particular formation is a clear and significant factor involved not just in the current unsustainability of the Barbadian sugar sector but also in the derivation of a whole range of unsustainable events which have occurred outside the industry itself.

The inequity of the plantation system in Barbados strikes straight to the heart of the moral dimension of sustainable development. More than this however, the plantation system in Barbados is unsustainable because it has become manifestly dysfunctional (Booker Tate, 1993). If the events of the last few decades in Barbados tell us anything it is that this traditional formation is no longer suited to sugar production on the island, and indeed that it is probably an inappropriate and inviable basis for any form of agriculture. On the one hand, the plantations exist in a form which reflects outdated production techniques. Production units are optimised to three hundred year old farming systems - systems which are no longer efficient or appropriate. But more than this, they also appear to be fundamentally unsustainable in that they are incapable of evolving to new conditions. In practice, the average size of plantations in Barbados is probably not incompatible with sustainable sugar cane agriculture - certainly similar sized units in Queensland don't have the same problems. Within this however, field sizes, the use of labour and machinery and many of the agricultural techniques used are all the product of inertia - legacies of the past - rather than elements of a rational, dynamic and well managed sugar production system. In itself, this is somewhat incongruous as it would be reasonable to expect that the plantation owners would have avidly pursued measures which would have enhanced the profitability of their enterprises. Particularly incongruous because the evidence would seem to suggest that the effective modernisation of the Barbadian sugar industry has not been fundamentally precluded by the lack of adequate capital to achieve this. Indeed, it would seem that the government support of the 1980s alone would have been sufficient to allow considerable progress to be made in this respect.

In practice, however, the plantation system is much more than a system of land holdings. It is fundamentally a particular social relation involving a landed class and, traditionally at least, a landless labouring class necessary for agricultural production to occur. Almost from its inception, the Barbadian sugar industry has faced problems of maintaining and reproducing an adequate labour supply. Historically this problem was addressed first through the use of bonded labour and slavery and subsequently through alternative but often only marginally less repressive means of coercion. One feature to emerge out of this is that class and racially based tensions have long been a potential threat to the sustainability of the Barbadian sugar industry. Recent experiences in Barbados would suggest that little has changed. What does

seem to have changed, however, is that the planter community no longer sees ensuring an adequate agricultural labour force as the key to reproducing its status. Indeed the current elite group on Barbados no longer sees sugar production or any other form of agriculture as being significant in this respect.

As the direct political power of the plantocracy has waned with universal suffrage and independence, the traditional planter community and its successors have striven, apparently with considerable success, to maintain the value of their capital and to construct new forms of power and influence (Beckles, 1990). Historically the basis of the plantocracy's power was located unconditionally within the sugar industry and this group strove to determine power structures and a political agenda which supported the sugar industry and hence the basis of their own wealth and power. Latterly, the elite class has been obliged to fundamentally reappraise their situation. The sugar industry and agricultural land are no longer the most viable investment opportunities in Barbados. The basis of capital accumulation has changed and so has the basis of wealth, power and privilege. The Barbadian elite class has responded to these new conditions by adopting new strategies. It has new goals and it has sought to influence the political agenda in new ways in order that it can pursue these goals more effectively. Or, perhaps more accurately, it has old goals that can now only be achieved in new ways.

7.3 **Plus ça change, moins ça change**

The sugar industry in Barbados, for so long the basis of wealth and power on the island, is now in a state of terminal decline. However, the elite group which has for centuries benefited from the profits of this industry appears to be successfully sustaining its own position. The sugar industry has become unsustainable and many of the fixed assets associated with the industry will inevitably be devalued, but the basic class structures of Barbadian society have remained - they have been sustained. And, moreover, it would seem that they have been sustained through more or less purposive and objective strategies pursued by this elite group - including the marginalisation of sugar production. Whatever the populist rhetoric may be, the powerful in Barbados have given up on the sugar industry. For so long a cash cow, the Barbadian sugar industry has now been transformed into an unholy hybrid of Judas goat and sacrificial lamb. New and more attractive investment opportunities have evolved and the Barbadian elite has responded to these developments. Their

strategy has changed from constructing a political agenda which supported the sugar industry to one which allows them to maintain their wealth, status and power in new ways. Engagement with new accumulation processes, however, has necessitated the extraction of as much capital as possible from the sugar sector, including government support for the industry, in order that it might be reinvested in new and different forms of economic activity.

What seems to be so incongruous in the Barbadian experience is the degree of success which the elite class has had in averting the unsustainability of their own position. This is particularly surprising given the aspirations of post-independence governments to pursue a development path largely determined by the perceived injustices of the island's unfortunate history. Populist political rhetoric during the post-independence period has always been centrally concerned with undermining the position of traditionally privileged groups within Barbados - essentially the white plantocracy. Whilst it is easy to understand why such an agenda has formed part of all political manifestos in post-independence Barbados, it is equally clear that the actuality of government policy and practice has been largely determined by effective impotence and real-politik than the singular pursuit of any developmental objectives. This real-politik has involved a situation in which successive post-independence governments could not ignore the ambitions of those who held and wielded economic power.

It would seem fair to say that the objectives of successive governments in Barbados have been genuinely progressive (Girvan, 1973; Pastor *et al., 1991*). The major political parties have always been broadly socialist and the immediate post-independence period was certainly perceived as being one of considerable opportunity and optimism. Almost thirty years after independence, however, some things have changed but others have not. There has been progress, for example living standards are relatively high and health and education provision are well developed by regional standards. These developments aside, however, the power and privilege enjoyed by the island's elite class remains as does its ability to exploit the island's resources and population. This group may be less obvious than the eighteenth century slave owners, or Beckles' merchant planter elite, and the forms of exploitation and legitimation may now be more subtle and less transparent, but in essence the basic pattern of social relations established within the seventeenth and eighteenth century plantation economy remains.

The issue here is not simply that this group is able to exploit Barbadian resources largely for its own ends, or that the inequitable distribution of wealth on the island is in itself incompatible with notions of sustainable development. Also crucial are the unsustainable outcomes which have resulted from the processes through which the elite group has been able to sustain its own position and status. Here lies the basis of much that is unsustainable in present day Barbados. And what is important here, is not simply an understanding of the structures and mechanisms which have tended to produce such outcomes, equally significant is the social and political context which has allowed these tendencies to be realised in practice.

7.4 **The incidentally unsustainable**

As the sustainability of the plantocracy became increasingly prejudiced in recent decades, this group has been able to purposively, and in large part successfully, avert the loss of its own wealth, status and power. It has been able to achieve this despite the emergence of new conditions which have served to undermine the traditional basis of its position. It has accomplished this self-preservation first, through ensuring a large amount of support for the sugar sector from the Barbadian government, and second through progressively transferring the economic basis of its standing (including much of support provided by the GOB) from its traditional location in sugar cane agriculture to new and different forms of economic activity. These actions were clearly central to the demise of the sugar industry. It may be that this demise was inevitable and that the flow of capital out of the industry merely reflected and perhaps preempted the realisation of its final demise, but it is not clear that this has in fact been the case. It is equally possible that the sugar industry could have been sustained given real commitment to the industry's future by all the parties involved - something which clearly has not occurred. Whilst this might have meant that more profitable investment opportunities would have had to be forgone (from a neo-liberal perspective, a sub-optimal solution), what has actually occurred is effectively the worst of both worlds: the GOB has supported the industry with large amounts of capital which could have been used to finance other development and the industry has still continued its decline. In practice, it may well be that the sugar industry could only have been sustained through quite radical measures which would have undermined the position and status of the plantocracy, something which given the power and influence of this group, even in post-independence Barbados,

was never likely to happen. Although the present sugar industry restructuring programme tacitly accepts that the plantation system and much of what goes with it is at the heart of current problems within the sugar industry, the measures adopted have deliberately been left well short of anything which would really disadvantage the land owning class.

Even if we accept the neo-liberal view that the old and relatively unprofitable need to go, there are major problems here from the perspective of sustainable development. Not only has the old industry gone, but capital on which it was based has also gone. As, for that matter, has the quite large amounts of money invested in the industry by the Barbadian government. In so far as this capital is being invested in new, and presumably more profitable economic opportunities, such as tourism, it may well be that the overall productivity of the island, and thus it might be argued overall welfare, is being increased. That is to say that the collapse of the sugar industry is, in fact, development. This is, however, only a valid appraisal if neither the capital or subsequent profits involved are exported, and it is far from clear whether this has been the case in Barbados. The tourist industry is a case in point here. At best the development of this industry has proved to be something of a two-edged sword for Barbados - certainly a very high percentage of profits are exported. Over and above these considerations, however, the restructuring process itself appears to have produced a whole range of unsustainable outcomes. Outcomes which for the most part are not adequately accounted for in conventional neo-liberal conceptions of development.

As planters have embarked on a process of relocating their assets, both individual plantations and the milling sector have been systematically run down. What has transpired in Barbados is not simply that an increasingly unprofitable industry has no longer been able to maintain sufficient levels of investment to secure its future viability. Certainly planters have traditionally been more prone to engage in conspicuous consumption than to invest in new agricultural machinery, but what appears to have occurred has gone some considerable way beyond this. Large elements of the planter community have systematically and objectively transferred capital out of this sector. This has involved not just a lack of investment in new machinery and plant, but also recourse to clearly unsustainable practices such as extended ratooning. Extended ratooning is a profound and telling exemplar of what has been occurring on Barbados. The physical degradation of soils implicit in this practice (Blume, 1985;75; de Boer, 1981) mean that it is inherently

unsustainable; first in that it can only proceed for a limited period, and second in that it precludes the future development of different forms of agriculture. It is so obviously an exercise in mining value, so patently a road to nowhere as far as agriculture is concerned, no rational planter who wished to remain in farming would engage in such a practice. Moreover, the quite widespread adoption of extended ratooning cannot be adequately explained by a general and over-riding requirement for short-term cost savings - BNB loans to the plantation sector far exceeded the costs of normal cultivation practices. Extended ratooning makes very short term super profit, but fundamentally undermines the potential for future agricultural production and future profits from agriculture. And in so much as ratooning can only be extended for a very limited number of years, such a practice is always likely to lead to other problems including the abandonment of formally productive agricultural land and associated processes of soil erosion (Hudson, 1994:4). Thus both the environmental and economic sustainability of the land is severely prejudiced. Extended ratooning is the strategy of someone who has little intention of continuing in agriculture. In practice, however, extended ratooning is merely one example of the strategies adopted by the planter community. In total, these strategies have produced conditions in the agricultural sector in which outcomes such accelerated soil erosion have been almost inevitable. Indeed the approach adopted has predicated a range of materially and morally unsustainable outcomes.

Whilst these events might be considered to be the unfortunate consequences of rational and legitimate decisions regarding the use of private capital, the wider development potential of Barbados has evidently been prejudiced by what has occurred. Not only have there been unsustainable impacts on the island's physical environment, there has also been extensive, apparently deliberate and clearly illicit misappropriation of the government funds allocated to the support of the sugar industry. Further to this, and perhaps most significant of all these events, is the fact that the new economic activities in which sugar industry capital is being invested may not be those which are most appropriate to the sustainable development of Barbados. Again the neo-liberal argument would suggest that these events have been brought about by the relative unprofitability of extant economic activities, and that investment in new, more profitable, forms of economic activity must be preferable. But it is not clear that this is the case here. For instance, it would seem to be manifestly reasonable to suggest that if sugar cane agriculture has to go, then the restructuring process should involve new forms of agriculture which (a)

utilise the large areas of redundant agricultural land; and (b) would potentially be useful in that they would reduce Barbados' heavy dependence on food imports. A diversified non-sugar agriculture may be marginally less profitable than alternative economic activities, but that does not necessarily mean that it is unprofitable *per se*, or that it is not an appropriate and desirable development for Barbados. Certainly the Barbados Ministry of Agriculture has argued for a more diversified agricultural sector for a considerable time. However, whilst it now seems to be inevitable that sugar cane will soon no longer be grown on Barbados, the possibility that the vacuum left by the demise of sugar cane agriculture will be filled by new forms of agriculture seems to be highly unrealistic. Certainly the experience of other Caribbean sugar islands such as Antigua would suggest that this is a highly unlikely scenario (Government of Antigua, 1991). As for that matter does the recent experience of Barbados itself. Areas of land in the Scotland District which have been taken out of sugar production in recent years have hardly been fully transferred to new forms of agriculture. Rather they have been subject to abandonment which has often resulted in severe soil loss, a process which has only been partially offset by government soil conservation programmes.

One factor which militates against the adoption of new forms of agriculture is that fact that many land owners are quite content to see their land idle, as they content themselves with the prospect of future development gain. From their perspective the less productive the land is seen to be the better the case for development permission to be granted. Beyond this, it also seems that however rational import substitution agriculture may appear, especially given the indirect and non-economic advantages which it embodies, its development might well compromise the profitability of various well established food importation and distribution enterprises. Although many of these enterprises are effectively incorporated within an increasingly globalised food system, the majority are still owned by Barbadian or Caribbean companies. In practice, they are owned by individuals and groups almost all of whom are, or have in the past been, centrally involved in the island's sugar sector.

For the most part, the environmentally and morally unsustainable events which have recently occurred in Barbados have not been the direct result of particular actions. Nobody has deliberately or directly pursued soil erosion or unemployment as a goal. Rather these developments have tended to be the indirect and indeed incidental consequences of strategies concerned to address quite distinct matters. As the Barbadian elite group has responded to

the changes which have increasingly come to threaten their position, they have acted to sustain their own interests. They appear to have been largely successful in achieving this. Unfortunately, this success has only occurred at the expense of the Barbadian environment and at considerable cost to the wider population. In total, the range of unsustainable outcomes which have transpired aggregate to a whole quite possibly sufficient to prejudice the overall development potential of Barbados.

7.6 **Sustaining privilege**

Until very recently the post-Colombian history of Barbados has been one in which a small elite group has prospered through the exercise of power founded on the ownership of land. Whilst its fortunes fluctuated over the years, and whilst individual planters did on occasions fail, the Barbadian sugar industry continued and often prospered. The industry produced great wealth, it made planters and merchants rich and it came to dominate the Barbadian economy to the almost total exclusion of almost all other economic activity. Throughout all of this the plantocracy, a small group of historically white landowners, were able to assure the reproduction of the conditions necessary for the production of sugar and thus the maintenance of their own wealth and their status. At times problems did emerge, particularly in ensuring the supply of labour necessary for sugar cane agriculture. At other times volatility in the world sugar market periodically threatened the viability of the sugar industry. Around the end of the nineteenth century, Barbados and other colonial cane sugar producers were particularly threatened by the development of beet sugar industries in Europe and elsewhere. But throughout all of this, the Barbadian sugar industry was sustained and the status and privilege of the plantocracy was sustained along with it.

It is interesting here to speculate what measures allowed this elite community to maintain a state of affairs so inequitable, so repressive and apparently so precarious and insecure for so long. Until emancipation, sugar production was ensured through the most direct forms of coercion: firstly through the use of indentured labour and subsequently through slavery. The abolition of slavery, a system which had in any case become quite dysfunctional by the early 1800s, necessitated new forms of regulation. Something which was not as problematic on Barbados as it was elsewhere because the small size of the island meant that no unused or unowned land was available for the freed

slaves. The survival of the emancipated population was only possible through wage labour on sugar plantations. In practice, the plantation economy and all that went with it was sustained throughout the nineteenth century and indeed throughout the vast majority of the twentieth century with relative facility.

The second half of the twentieth century, however, has witnessed many changes in Barbados. Freedom from colonial control produced new development objectives, and ostensibly a relocation of political power. Independence did not however effectively change Barbados' markets for sugar which became institutionalised within the ACP agreement. That said, whilst it has been suggested here that the demise of the island's sugar industry needs to be explained in terms of largely indigenous factors, the wider context cannot be totally ignored. Income from the sugar industry may have been secured by the ACP arrangements, but wider developments have affected the relative profitability of this industry on Barbados. Perhaps crucially, it is clear to all concerned that the ACP arrangements are unlikely to continue in their present form beyond the medium term. Within this, it is equally apparent that when the EU discontinues or even merely starts to decrease its support, the Barbadian sugar industry will then be unprofitable however it is run. From this perspective, the future of the Barbadian sugar industry has been, at best, uncertain for some time. Once this far from profound realisation had been made and the inevitability of the situation accepted, the rational response of those involved in the industry is to do whatever they can to protect their own interests. Clearly, in a situation such as this, some individuals and groups are better placed than others to evaluate the situation and more able to respond in ways which effectively protect their own interests.

It is hardly profound to suggest that individuals will tend to pursue their own self interests or that those with most power are likely to be the most successful in these endeavours. And it is hardly more trenchant to suggest that direct political power is often transcended by and rendered inconsequential by economic processes and the exercise of economic power. That said, it is perhaps illuminating to witness just how profoundly, and with what facility, a small group of people within Barbados have been able to maintain their own wealth and status through the exercise of economic and hence political power. That this had transpired in Barbados is perhaps particularly surprising given the overt hostility which exists between the elite class and the government and wider population of the island. Indeed it is difficult to appreciate the degree to which the events have apparently been

controlled and subverted by elite interests. The transparency with which the elite has been able appropriate government funds through the sugar industry support system, and the considerable development gains which have been made appear to reflect something not too far removed from corruption. But underlying these events is something more subtle and more profound. Crucial aspects of the political agenda have been significantly influenced by this increasingly obscure but clearly still very powerful group.

A particular group of people in Barbados have been able to sustain their own position, the value of their assets, their status and their power through the exercise of economic power. However, in itself the economic basis of their power would hardly seem to be sufficient to explain what has occurred. Certainly, it would seem that the self-interested strategies adopted by this group were necessarily legitimated and empowered by institutions and values embedded in the society as a whole despite the fact that both the general population and successive governments have been highly unsympathetic to this group and its objectives. The ways in which such strategies are substantiated and capacitated within a mode of social regulation may well be of paramount importance to any understanding of how many unsustainable events come about and how they might be avoided.

7.7 **Regulatory failure**

Much that has happened in Barbados could be interpreted as regulatory failure. Specific examples of environmental degradation are easily identifiable, and many of the social consequences of current restructuring process appear to be unsustainable in ways which transcend the purely moral constituencies of the term. Certainly apparently desirable non-economic aspects of development such as the amenity value of the island (though this may in fact have quite significant economic repercussions for the tourist industry) have been foregone. Indeed, more material forms of unsustainability have also occurred through processes such as soil mining. Moreover, it would appear that recent developments have already engendered new contradictions and forms of dysfunction which are likely to prejudice not only the sustainability of these developments themselves but also the wider development of all Barbados.

Although this is clearly an artificial division, it may nevertheless be useful to differentiate between more concrete instances of regulation - 'real regulation', legislation and the like - and what might be termed higher order elements of a mode of social regulation. Regulation, in the broad sense in which it has been used throughout this thesis, is concerned with ensuring the conditions needed for a sustainable economy and a sustainable society. This involves something much more than merely addressing specific, concrete problems. The regulatory system in Barbados appears to have been inadequate in both the narrow and the broad senses in which the term is used.

To some extent, failure of regulation, in the narrow sense, may simply reflect the inadequacies of the regulatory system which one might expect to exist in a developing country. Specific measures have been enacted, for example, to control and redress soil erosion, or for that matter to provide labour supplies for the sugar industry, but these initiatives have hardly resolved the problems being experienced. Indeed, it may well be that this failure reflects the impracticability of managing sustainable development discussed in the first chapter of this thesis. After the fact, *ad hoc*, end of pipe measures designed to address specific problems are never likely to be totally effective or capable of ensuring sustainable development. If specific sustainability problems are to be effectively addressed, the regulatory system needs to encompass 'higher order' instances of regulation which predispose development to modes in which unsustainable practices and events are unlikely to occur. However, it would be difficult to argue that what has occurred in Barbados over recent years has been particularly effective in this broad regulatory sense. If the objective of regulation in this sense is the maintenance of the conditions necessary for social and economic sustainability, it is far from clear that this has been achieved in Barbados. Whilst we must accept the regulationist position that modes of social regulation come about more through experimentation, struggle and conflict than through objective promotion *per se*, specific and supposedly purposive actions in Barbados have clearly played an important part in the evolution of the mode of social regulation now existing there.

Although, in itself, the collapse of the sugar industry hardly constitutes an example of 'broad' regulatory failure, it could be argued more convincingly that regulatory failure was important in the collapse of the industry. Certainly the dysfunctional hostility which has occurred between the planters and the work force would seem to support such a contention. However, it might be more succinct to argue that regulation in this sense is more concerned with

sustaining accumulation rather than any particular form of production. Viewed in this way it is less clear that there has been regulatory failure. Much depends on whether the conditions needed for new forms of accumulation to function have been ensured, and again this is somewhat less than clearly the case. Within this, however, what is undeniable is that the Barbadian government invested large amounts of capital in vain efforts to sustain the sugar industry.

Sustaining the sugar industry has always been part of Barbadian government policy. This objective has been justified on several grounds: export earnings, employment and environmental considerations being just some of reasons commonly cited. Over and above these, however, it also seems that the quite dominant role which sugar has played in Barbados' history has given the industry a political significance which far exceed its economic worth. From this perspective, sustaining the sugar industry can be seen as an important element of the mode of social regulation. The sugar industry has, at one and the same time, been a means of accumulation and also a significant instrument of regulation and social control. Whatever popular opinion may have been regarding the plantocracy and for that matter with regard to working in the sugar industry, the industry was widely perceived as a barometer of Barbados' well being. Sugar production was for so long what Barbados did well that problems in the industry are popularly seen as a reflection of poor government and an increasingly dysfunctional pattern of development on the island. Such perceptions may not be fully valid, but they were certainly widely held, and from a political, and indeed regulationist perspective, they may be quite significant.

From a regulationist standpoint any particular capitalist formation is always likely to be crisis prone and in the last instance insupportable. From this perspective Barbadian government support for the sugar industry may well have been ill-conceived and inappropriate. Notwithstanding these arguments, it could still be argued that the long history of various kinds of support for the Barbadian sugar industry have created conditions which are anything but conducive to innovation, efficiency and competitiveness. A situation which has perhaps been compounded by a belief within the sugar industry that efficiency is hardly an important goal because the sugar sector will always be baled out of any difficult situation by the Barbadian government. Certainly until very recently, such a belief may well have had some substance for two reasons. First, historically, the Barbadian economy was so dependent on sugar that the

consequences of a collapse of the industry would have been so profound that any Barbadian government would have been obliged to support the industry almost irrespective of the costs involved. Second, the planter community appears to have had considerable confidence in its ability to manipulate the political agenda to its own ends.

7.8 Tendency and realisation: structures, mechanisms and empowerment

A major theme emerging within this chapter centres around the recognition that the basis of much that is unsustainable in Barbados lies in the unsustainability of relict social and economic formations. In particular, it has been argued that the plantation system and the class structures which accompany this have become increasingly incongruous, insecure and unsustainable. And, that this relational unsustainability has been translated into environmental, social and indeed moral manifestations of unsustainability. This process of translation whereby particular class structures are maintained at the expense of other aspects of development may be crucial to understanding the causality of the unsustainable in Barbados, and perhaps elsewhere. A key point here is that what is being sustained is no more than a particular pattern of social relations; extant accumulation systems and extant industries are equally as extraneous and vulnerable as anything else.

The factors underpinning the unsustainability of extant social and economic formations on Barbados are multifarious. On the one hand, developments largely external to Barbados have changed the context in which economic activity on the island occurs. Whilst the ACP arrangements have provided some security for the sugar sector the future of these is now uncertain. Technological developments have undermined Barbados' comparative advantage in sugar production and have led, for example through developments in air travel, to the expansion of other sectors such as tourism. Beyond this, however, extant social and economic formations have become increasingly dysfunctional because of the nature of what they are. It has long been recognised that the plantation system is prone to inertia and poorly equipped to respond to changing conditions. Moreover, the inherent inequity of the established class structure in Barbados has also continued to create new contradictions within the sugar sector.

During the 1980s, the Barbadian sugar industry became increasingly unable to secure its future. Labour problems became more acute as alternative employment opportunities developed and traditional forms of coercion and legitimation have became untenable. The sugar industry proved to be quite incapable of modernisation, not because there was no capital available to finance this, but because the land owning class either could not or would not fully adopt new practices or invest the necessary capital. However, the elite social group on the island has been able to sustain its own privileged position. It has achieved this through responding positively to changes in the economic and social environment from which it derived the basis of its status. Traditional forms of accumulation have become unsound and untenable. Specifically, the sugar industry has no future. When an industry such as this ceases to function the fixed assets and resources upon which it has been based are clearly and unavoidably going to be devalued. And all things being equal, the capital employed in the industry and the status of those who own and control this is also likely to be devalorised. But this is not what has occurred in Barbados.

Whilst the processes involved have not yet quite run their full course, what has actually happened in Barbados is that the fixed assts and the natural resources involved in the sugar industry are indeed being devalued, but the value of capital and the relative position of the capitalist class is being sustained. The insignificant is being sustained at the expense of the materially and morally consequential. Increasingly cognisant of the unsustainability of the sugar industry, the historical basis of their position, the owners of the industry have striven to extract every last cent from the ashes of its funeral pyre. Thus what has occurred is not simply that the resources involved have ceased to be useful in that they are no longer the basis of a productive industry. (An important point is that many of the resources involved here need to be seen as multiple resources, that is, they potentially have use values outside the sugar industry). In practice, the resource base of the sugar industry has been systematically overexploited and degraded. The rational pursuit of capitalist self interest has resulted directly in a range of unsustainable outcomes.

The processes of capital extraction and transfer which have been central to the collapse of the Barbadian sugar industry have also been instrumental in promoting a range of unsustainable outcomes outside the industry itself. This process has been effective in sustaining a long established pattern of social

relations, but it has served to undermine the development potential of Barbados as a whole. The process of salvaging capital from the sugar sector has created conditions in which a range of unsustainable outcomes were always likely to eventuate. A direct relationship exists between the unsustainability of a particular capitalist formation and a range of unsustainable events both within and outside the sugar sector.

A key mechanism involved here appears to have been the transfer of capital out of the sugar industry. The sugar industry has not been run down in a planned manner which preserved the resources involved and sought to replace sugar cane with different forms of agriculture. Capital has moved to different sectors and to different locations and this has resulted in a range of unsustainable outcomes. The fact that the resources upon which the sugar industry had been based are no longer utilised, or more succinctly that they no longer have any economic value, is in itself neither here nor there. Resources are dynamic, things become resources, things cease to be resources. What is unquestionably significant from a sustainable development perspective, however, is that a number of resources, for example formally productive agricultural land, have been degraded simply in order that the value of capital might be preserved.

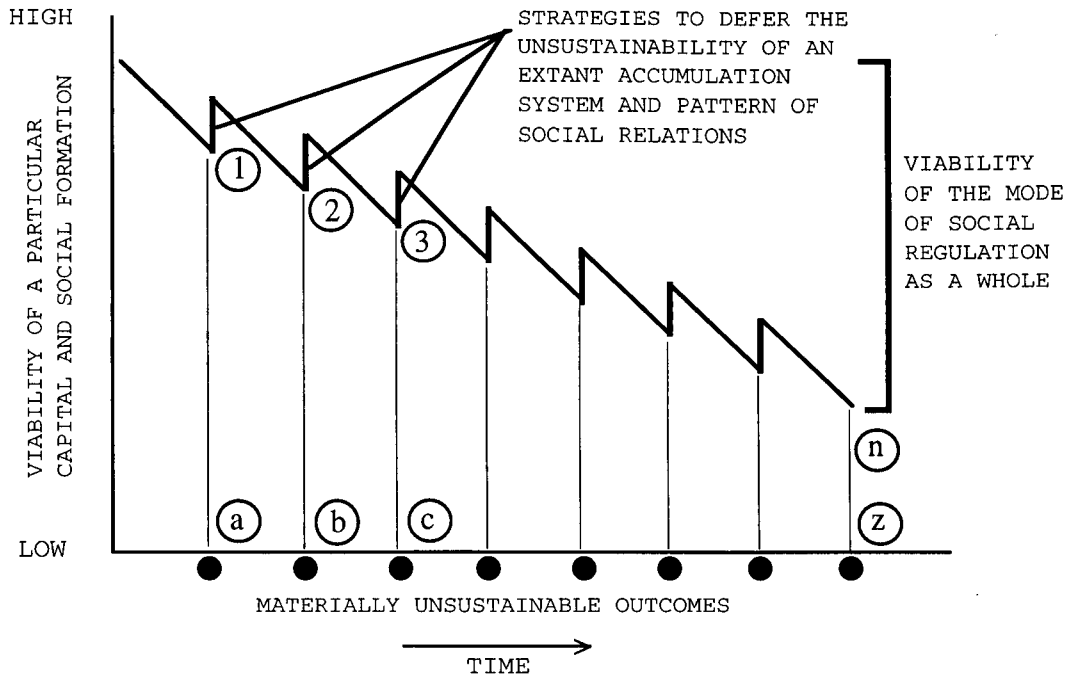
Some of the strategies employed by the planter community have clearly been illicit. Although it is unlikely in the extreme that anyone will ever be prosecuted for false accounting or corruption, the spirit of the law has clearly been severely stretched. Both the misappropriation of government support for the sugar industry and subversion of planning regulations clearly flirt with the bounds of both legality and morality. In themselves these events are a highly significant commentary on the effectiveness of the regulatory system on Barbados. But more significant still is the fact that the basic process involved here, the movement of private capital out of the sugar industry, is a totally legitimate exercise. Indeed not just in Barbados but throughout the capitalist world, liberalisation of financial controls and terms of trade have been specifically designed to facilitate actions of this type. Thus we have an inconsonant situation in which a mode of social regulation creates conditions which tend to produce unsustainable outcomes which subsequently have to be addressed through specific regulatory measures.

This interpretation of events in Barbados corresponds quite precisely with, and would seem to support, the realist explanation of unsustainable practices

and events developed in chapter 3. As the viability of the extant socio-economic formation in Barbados has become increasingly prejudiced and unsustainable through time, strategies have been developed to defer this unsustainability and, as suggested in chapter 3, these have produced a range of unsustainable outcomes. Figure 7.1 relates recent events in Barbados directly to this conceptual framework.

As the extant socio-economic formation on the island became increasingly insecure during the 1970s and 1980s, strategies were adopted to defer this unsustainability. Thus for example, strategy #1 might well represent extended ratooning. This is effectively a mechanism for minimising production costs which allows increased profitability in the short term. But this practice results directly in soil nutrient depletion an damage to soil structure. In other words, it leads to the materially unsustainable outcomes indicated at moment #a on the horizontal axis of the graph. Strategy #2 could be government subsidy of the sugar sector. Strategy #3 could be the transfer of capital out of the agricultural sector. Again both of these mechanisms are associated directly with materially or morally unsustainable outcomes.

Fig.7.1 **The Mode of Social Regulation and unsustainable outcomes**



Government subsidy of the sugar sector could be seen as unsustainable because in so much as it serves to sustain a sub-economic industry it produces a less than optimal pattern of development. There is some evidence that this has been the case in Barbados, a long history of subsidy and protection has resulted in manifestly inefficient production systems. These could be regarded as an unsustainable outcome in that overall welfare is clearly prejudiced by such a situation. The apparent misappropriation of government subsidies which appears to have occurred in Barbados must also have a material impact on the wider development of the island, and again could be construed as an unsustainable outcome. Certainly, it is unsustainable in the sense that it externalises the contradictions which have emerged within the sugar sector itself.

Similarly, the transference of capital out of the sugar sector appears to have produced a range of materially and morally unsustainable outcomes. Whilst this mechanism has served to sustain the economic basis of the land owners, it has simultaneously made a range of materially unsustainable outcomes related to the inappropriate farming practices almost inevitable. Beyond this, the effective transfer of government funds to individuals and private companies has clearly prejudiced the wider development of Barbados, in a situation where that country already has significant international debts and ongoing balance of payments difficulties.

In practice, the relationship between the structures which give rise to these mechanisms and the actual outcomes produced is governed by the nature of the mode of social regulation. Objects and structures such as those embodied in the global sugar economy, the ACP Protocol and the pattern of social relations and land tenure system existing in Barbados, tend to produce contradictions and tensions which undermine the profitability of sugar production and thus encourage the types of strategy adopted. But the mechanisms which these strategies embody are only 'activated' when they are legitimated and empowered by the institutions and values which are the mode of social regulation. Thus in this case, at least, there are structurally defined tendencies which predicate particular mechanisms which, in turn tend to produce a particular type of outcome. Thus it would appear that an 'internal' or 'necessary' relationship exists between these objects and structures and the materially and morally unsustainable outcomes which tend to occur, and indeed in this case actually have occurred. However, this relationship within which 'relational unsustainability' is translated into 'material unsustainability'

is itself fundamentally conditioned by the mode of social regulation. And a crucial point here is that whilst the mode of social regulation legitimates and empowers strategies which are temporarily 'successful', new contradictions and tensions will continue to emerge and new strategies will have to be put forward to address these And in practice, because the contradictions generated are likely to become increasingly profound, strategy #n is likely to involve more extreme forms of exploitation than earlier strategies. Thus, event #z is likely to be a profoundly unsustainable outcome.

To understand the causality of these unsustainable outcomes from a realist perspective it is necessary to understand, first what mechanisms are involved; second the objects and structures which give rise to these; and third the context which substantiates these processes. In practice, this context is defined by those elements of the mode of social regulation which legitimate and empower the mechanisms involved. Various specific mechanisms appear to have been involved here, but a key causal mechanism has been the transfer of capital out of the sugar sector. Thus we might infer, or 'retroduce' the existence of structures and objects which are necessary for this to have occurred. There must have been, for example, a particular form of property rights for this to have been possible. In this case, landownership patterns and the private property rights constituted in the plantation system have allowed individuals and companies to pursue particular strategies. But the very fact that these strategies have been successful, suggests that other structures constituted in the institutional and social conditions existing in Barbados have also been significant. Thus we could see some significance in the ineffectiveness of the planning control system. And, perhaps more importantly, in the ways in which the land owning class have been able to manipulate the political agenda to their own advantage.

In Barbados an extant socio-economic formation - the sugar sector and the pattern of social relations which historically has been associated with this - has become increasingly prejudiced and crisis prone. This has created tendencies to overexploit environmental and human resources. In practice, these tendencies have frequently been realised in practice because the mechanisms involved have been legitimated and empowered by the mode of social regulation. The mode of social regulation existing in Barbados prioritises and objectifies strategies designed to sustain the value of capital and through this to sustain extant class structures. Almost inevitably,

therefore, the mode of social regulation legitimates increasingly and ultimately unsustainable forms of exploitation.

As the Barbados case shows, the realisation of particular events reflects not just structurally defined tendencies and contingency, but also the conditions in which the mechanisms involved operate. Faced with the unsustainability of their position the Barbadian elite class embarked, quite objectively, on courses of action which would protect their status, the more or less direct consequences of which were always likely to result in a range of unsustainable outcomes. But, crucially if these unsustainable outcomes were to be actually realised, the processes and mechanisms set in place needed to function effectively. Given the nature of these processes, this could only occur if they were legitimated and empowered by the prevailing mode of social regulation. Thus it follows that if these processes and mechanisms were not empowered, then the tendencies to the unsustainable which they involve would not have been realised.

Successive governments in Barbados have become increasingly acquiescent regarding neo-liberal approaches to development. In part, this may reflect the country's weak financial position and pressure from the IMF. Equally, however, policies such as the liberalisation of commercial activity, the formation of a Barbados securities exchange and the development of an off-shore financial services sector are all increasingly seen as necessary if not totally desirable developments. Thus whilst the processes through which the elite has been able to sustain the validity of its own economic position has certainly reflected the inadequacy of the island's regulatory system, these processes have also been facilitated by the adoption of increasingly neo-liberal policies, including moves to liberalise financial controls in Barbados.

The current mode of social regulation on Barbados has served to legitimate and empower processes which sustain extant class structures and the privilege of an elite community but only at the cost of conditioning development to the unsustainable. The outcome is a whole range of unsustainable practices and events which cannot be effectively addressed in their specificity. The achievement of sustainable development requires that development is conditioned in ways which avoid the unsustainable rather than predispose it. In practice, this means that, amongst other things, those elements of the mode of social regulation which legitimate flows of capital through economies need to be re-evaluated.

7.9 **Conclusions**

This analysis supports the contention that unsustainable practices and events need to be, and can be, understood and addressed as the outcomes of economic and social processes and the institutional and social conditions in which these occur. The interpretation of recent occurrences in Barbados which has been developed in this chapter shows a more or less direct link between the unsustainability of the extant socio-economic formation on the island and a range of materially and morally unsustainable practices and events. It appears that the inherent tendency to unsustainability of this formation has been averted through mechanisms which have translated this into other more material and more significant forms of unsustainability. In particular, it appears that the mode of social regulation in Barbados, which involves both traditional and newly emerging regulatory forms, has legitimated and enabled strategies which prioritise, objectify and prescribe flexibility to the value of capital and the reproduction of extant class structures. In this way, the mode of social regulation in Barbados has conditioned development to the unsustainable.

Chapter 8 THE AUSTRALIAN SUGAR INDUSTRY

This chapter begins with a brief description of Australian sugar producing areas and a short history of the Australian sugar industry. The current structure of Australian sugar production is then outlined in some detail. Particular attention is paid to the nature of the sugar industry regulatory system which has been in place for most of the twentieth century. The next section of the chapter considers the impacts of the deregulatory process currently being enacted. The final sections are based on case studies of two sugar producing regions in Queensland. The discussion focuses on the problems currently faced by the industry and the coping strategies which have been adopted. Particular attention is paid to the range of environmental, agronomic, economic, social and moral forms of unsustainability currently occurring within the Australian industry.

8.1 The Australian sugar industry

Australia is atypical of most sugar cane growing countries in that it is a developed country with a high wage economy. Australian per capita GDP stood at US$17,000 in 1990 (World Bank, 1992). Over 80% of Australia's total population of 17.1 million live in the state capitals and other urban centres. Population densities are extremely low in most rural areas. With a total land area of 7,687 square kilometres Australia is a very large country, but climate, especially rainfall patterns, severely reduce the amount of land suitable for most forms of agriculture.

A former British colony, Australia has been independent since 1901 and has a federal system of government with legislative powers vested in both commonwealth and state parliaments. Although now considerably less important than they were in the past, primary industries remain highly significant in the Australian economy. Primary commodities accounted for 53% of the value of Australian exports in 1990 (World Bank, 1992). Within this, sugar accounted for approximately 6.5% of the value of Australian farm based exports in 1991 (Australian Bureau of Agricultural Resource Economics [ABARE], 1991a:4).

Commercial production of cane sugar in Australia did not begin until the 1860s. The first crop produced in Queensland was planted in 1862, but drought and financing problems meant that expansion was initially slow with only 338 tons of sugar being produced in 1867. By 1874, however, there were 71 operational mills producing over 4,200 tons of sugar (Graves, 1993:12).

Although the Australian sugar industry had its origins in Northern New South Wales and Southern Queensland, these areas were climatically less than optimal for sugar cane agriculture and the industry soon expanded into warmer and wetter areas further north. The port of MacKay, for example, rapidly become an important centre of sugar cane agriculture and milling with over 1,000 acres of cane being brought under cultivation and 17 mills being constructed between 1870 and 1874. By the last decades of the nineteenth century, sugar production had become firmly established in a number of pockets along Australia's north east coast.

Despite the fact that the establishment of the Australian sugar industry post-dated that in Barbados by over two hundred years, a number of close parallels exist in the patterns of development experienced in these two locations. The most significant element of commonality was the plantation. As had been the case in Barbados, early sugar cane production and processing in Queensland was organised around a plantation system. To some extent, it may be that early producers in Queensland merely sought to emulate the models existing elsewhere in the world at that time. But, equally, it may well be that the nature of sugar production at that time predicated the type of systems which might be used. Few individuals in nineteenth century Australia were in a position to establish a sugar production enterprise which required not only land but also the construction of an expensive mill and access to large amounts of labour if the crop was to be successfully cultivated and subsequently processed. Thus in practice, the nature of sugar production in the mid-nineteenth century may well have served to determine not only the type of production system used in the sugar industry, but also to define and actualise the pattern of social relations upon which the plantation system relied. A key difference in the histories of the Barbadian and Queensland sugar industries is that whilst the plantation has for the most part remained the basis of production on Barbados, it had essentially ceased to exist in Australia by the end of the nineteenth century. From that time onwards sugar production in Australia has been based on large numbers of family farms.

The cardinal problem underlying the collapse of the plantation system in Queensland was that of ensuring adequate labour supplies. Early plantations in the Caribbean had used slave labour and, whilst slavery *per se* was never an option available to Australian planters, attempts to maintain an adequate labour force were to become increasingly coercive. Throughout most of the

plantation period in Queensland, the industry relied heavily on the use of foreign labourers. Initially Chinese and other Asian labourers and to a lesser extent European workers were recruited, but the principal body of labour used during the second half of the nineteenth century consisted of Pacific islanders. These islanders were recruited by specialist traders on their home islands and contracted to work for specific periods at predetermined rates of pay. By the 1880s there were over 5,000 Pacific island labourers or 'kanakas' working on Queensland cane farms (Graves, 1993:40). Pacific islanders, coming as they did from radically different cultures to that in Queensland did not constitute an ideal workforce, but they were at least sufficient to allow the industry to function and indeed expand. Having made a quite considerable investment to secure a workforce, planters often went to considerable lengths to ensure a return on their investment. The conditions in which these Pacific islanders worked were typically extremely poor, with various forms of coercion, including violence and intimidation, becoming increasingly common as the century progressed (Graves, 1993). Within a relatively short period of time, however, the recruitment and retention of this labour force was to become increasingly difficult. Not only did the costs of recruiting these labourers rise significantly, but it eventually became difficult to obtain new workers at any price. Moreover, the treatment commonly afforded these workers had produced some considerable moral outrage in Australia, and this led to legislation controlling their conditions of employment and eventually to a statutory ban on the importation of Pacific island labour into Queensland in 1904. Thus the trade in and use of 'kanaka' labour came to an end at the turn of the century with all but 1,600 islanders having been repatriated by the end of 1907 (Shlomowitz, 1982; Saunders, 1982; Graves, 1993). With this supply of labour no longer available, the plantations were unable to function and the transition to a new system of production became unavoidable. As Graves puts it:

> "Here was an industry highly stressed by the need to optimise surplus extraction under extremely adverse circumstances, through the exploitation of a labour force which was not merely inexperienced but was largely unaccustomed to the rigorous time and work discipline demanded by capitalist agro-industry. These acute stresses not only prompted the introduction of 'progressive' work and organisational practices, but also an extremely labour-coercive system, which not only appealed to a range of legislative and social controls, but which relied on the pervasive threat of violence against plantation workers. How effective these strategies were, is of course, open to question for .... Queensland's plantations were found wanting and were rapidly replaced by a less objectionable, and more dynamic system of production. Powerful

> though the institution of the plantation was, it was insufficient to serve all the industry's needs" (Graves, 1993:132).

Although the plantation system in Queensland was rendered unsustainable because of labour supply problems, other concurrent developments were also militating for change. Developments in milling technology, for example, were quickly rendering the traditional, plantation based, cane processing systems obsolete. As was the case in Barbados and indeed in almost all sugar producing regions, the inherently superior efficiency of large centralised mills meant that a separation of the agricultural and industrial components of sugar production was inevitable. With land on redundant plantations widely available, and with the requirement to finance a mill no longer pertaining, the conditions conducive to the entry of many smaller cane farmers suddenly became established in Queensland around the turn of the century. The demise of the plantations led directly to a production system based on family farming allied to the use of centralised factories. This structure of production has essentially remained intact throughout the past ninety years.

While the basic geography and structure of the industry had already been defined by the turn of the century, the area under cane has increased more or less consistently since then as the amount of local land used for cane has periodically been expanded in established sugar producing regions. As this expansion progressed during the inter-war and immediate post-war periods, individual cane farms tended to grow in size and many were again faced with problem of obtaining adequate supplies of labour, especially during the harvest season. And again, many came to rely on immigrant labour, in this instance usually of European origin (see for example, Kerr, 1988; Manning, 1983). One enduring legacy of the use of immigrant labour on Queensland cane farms during the 1940s and 1950s is the present day concentration of ethnic minority groups in several cane producing areas. In many cases immigrant workers have become established cane farmers in their own right. In the Bundaberg area, for example, there are significant numbers of ethnically Italian cane farmers and in the Mackay area there is a substantial minority of farmers of Maltese descent. Although by the early 1990s, most of these farmers are second generation Australians, ethnic groupings often remain clearly defined.

However, the period of reliance on off-farm labour which occurred during the inter-war and immediate post-war periods was short-lived as increasing mechanisation, particularly of the harvest, was to make sugar cane

agriculture an increasingly labour extensive exercise in Australia. The transition from labour intensive to mechanised production techniques mainly took place during the 1960s and 1970s (Manning, 1983). Rather than promoting a radically different structure of production, this transformation served to reinforce the position of the family farm as it allowed individual farmers to increase production without recourse to off-farm labour. The viability of the family farm was further supported by what was to become the highly intensive use of chemical pesticides and herbicides which also tended to make production less labour intensive. The present day Australian industry is probably the most technologically and chemically reliant sugar industry in the world. It is in many respects the epitome of capital intensive high-input, high-output agriculture.

Australia became a net exporter of sugar during the 1920s and by the post Second World War period, the majority of sugar production was being exported. Traditionally, Britain had always been the primary market for Australia's sugar exports and in 1954 this trade was formalised under the terms of the (British) Commonwealth Sugar Agreement. This was an arrangement which clearly had a number of benefits for the Australian industry:

> "Historically the industry has viewed the B.C.S.A. with a mixture of gratitude and sentiment. It certainly played an important role in the development of Australian sugar production during the fifties and provided a guaranteed outlet for about a quarter of Australia's exportable surplus in the sixties, when prices were low and over production made sales difficult. The B.C.S.A. also gave a price guarantee which up to 1973, could be said to have provided over the years, a better return than was possible for sales on the open market. From 1966 to 1971 the negotiated price was £43.50 per ton for the quota of 335,000 long tons, which was raised to £50.00 in 1971 and to £61.00 in 1974. The 1966-71 price gave an approximate return to the industry A$110.00 and at 1974 prices a return of about A$99.00 per ton" (Lance Jones and Co., 1975:27).

When the Commonwealth Sugar Agreement expired in 1975, Australia was the only former party to the agreement not to be included in the ACP Protocol of the Lomé Convention. Thus from 1975 onwards Australia had to find markets for substantial quantities of sugar exports within the global sugar economy. A large proportion of subsequent exports took place under a series of bilateral arrangements with importing countries, most notably with Japan. However, whilst these agreements may have created some degree of price stability for the industry, they never included any great premium over prevailing world market prices (Queensland Sugar Corporation, 1992b).

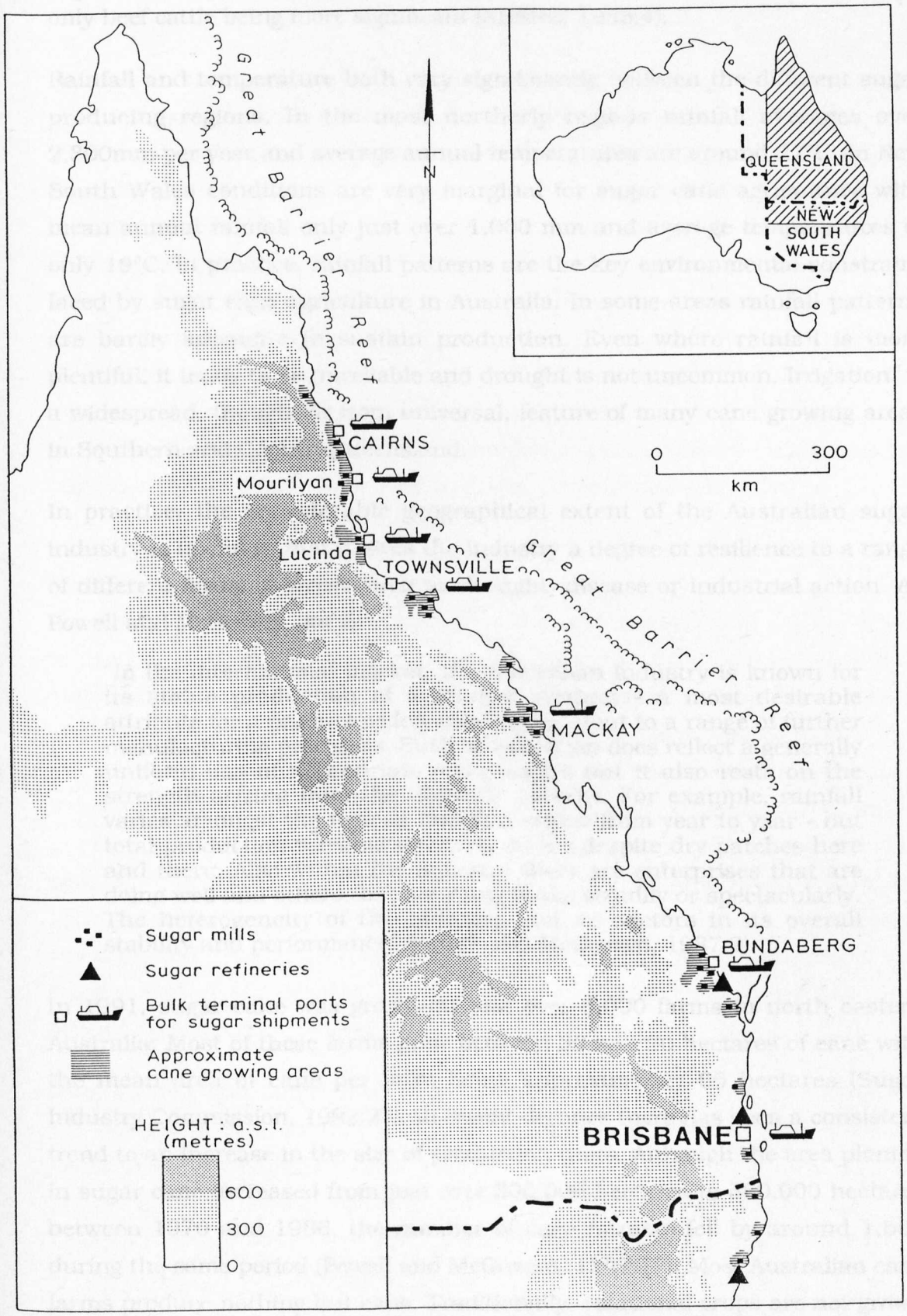
By the end of the 1980s Australia was exporting the majority of its sugar to nine main destinations. Japan accounted for 20% of all exports, Malaysia 19%, Canada 15%, South Korea 13%, the USSR 11%, China 7%, Singapore 6%, the USA 6% and New Zealand 3% (Sugar Board, 1991). Between 25% and 30% of these exports were covered by long-term contracts which existed with: Malaysia, South Korea, China and the Soviet Union (ABARE, 1991a:17). In practice, however, the situation is highly unstable and several developments outside Australia are likely to redefine its exports markets. The rapid growth of the Thai sugar industry has made Thailand an extremely important player within the regional context and further expansion seems likely. The role of Cuba is also highly significant and would become even more so if that country's relationship with the United States were to improve in the future. According to the Senate Committee on Industry Science and Technology (SCIST) (1989:12), the Australian sugar industry has probably been more exposed to world prices that of any other major producer. Ranking the exposure of exporting countries on a scale of 0 - no exposure, to 4 - complete exposure, only two countries Australia and Thailand rated a score of 3.

8.2 **The present day Australian sugar industry**

By the late 1980s, Australia was producing well over 4 million tonnes of sugar per year, which amounted to around 3.5% of total world sugar production. Approximately 80% of total raw sugar production was being exported at this time. Australia is the world's third largest sugar exporter with around 10% of world trade, after Cuba - 24% and the EU - 20% (F.O. Licht, 1994). Australian sugar exports had a value well in excess of A$1 billion in 1990 (Queensland Sugar Corporation, 1991:6). (At 1994 exchange rates, A$1=c.£0.50, c.US$0.75).

Seldom occurring more than fifty kilometres inland, sugar cane agriculture occurs in a number of pockets along Australia's east coast (see figure 8.1). The southernmost cane growing areas lie in the north east corner of New South Wales and the most northerly 2,100 miles away around the town of Mossman at the foot of the Cape York Peninsula in Queensland. The total area of land devoted to sugar cane in 1990 was 403,000 hectares, with 95% of this total occurring in Queensland (Sugar Industry Commission, 1992:23). Sugar is the

Figure 8.1. **Australian sugar producing areas.**



second most valuable agricultural commodity produced in Queensland with only beef cattle being more significant (ABARE, 1985:4).

Rainfall and temperature both vary significantly between the different sugar producing regions. In the most northerly regions rainfall averages over 2,300mm per year and average annual temperatures are around 27°C. In New South Wales conditions are very marginal for sugar cane agriculture with mean annual rainfall only just over 1,000 mm and average temperatures of only 19°C. In practice, rainfall patterns are the key environmental constraint faced by sugar cane agriculture in Australia. In some areas rainfall patterns are barely adequate to sustain production. Even where rainfall is more plentiful, it tends to be unreliable and drought is not uncommon. Irrigation, is a widespread, though far from universal, feature of many cane growing areas in Southern and Central Queensland.

In practice, the considerable geographical extent of the Australian sugar industry is useful in that it gives the industry a degree of resilience to a range of different forms of stress such as drought, disease or industrial action. As Powell and McGovern put it:

> "In the international market, the Australian industry is known for its stable production of a quality product - a most desirable attribute for a product widely used as an input to a range of further manufacturing processes. Such a reputation does reflect a generally uniform use of appropriate technologies but it also rests on the strength arising from the diversity present. For example, rainfall varies amongst the regions and in a region from year to year - but total production remains relatively stable despite dry patches here and there. Also within the industry there are enterprises that are doing well and others that are going broke steadily or spectacularly. The heterogeneity of the industry and its sectors in its overall stability and performance" (Powell and McGovern, 1987:9).

In 1991, sugar cane was grown on just over 6,000 farms in north eastern Australia. Most of these farms grew between 30 and 90 hectares of cane with the mean area of cane per farm being approximately 65 hectares (Sugar Industry Commission, 1992:23). In recent decades there has been a consistent trend to an increase in the size of production units. Although the area planted in sugar cane increased from just over 300,000 hectares to 360,000 hectares between 1970 and 1986, the number of cane farmers fell by around 1,500 during the same period (Powell and McGovern, 1987:17). Most Australian cane farms produce nothing but cane. Traditionally, rotational crops are not grown and often the entire farm is used for cane. Few cane farms employ any non-family labour although the majority use contractors for much of the

cultivation and harvesting work. Some 4,000 contractors are primarily engaged in sugar cane agriculture (Sugar Board, 1991:27).

Australia has been at the forefront of development of specialised technology for sugar cane agriculture for several decades. The first practical cane harvester was developed in Central Queensland and a Bundaberg based company remains the world's leading supplier of cane harvesters. The use of modern technology has become deeply ingrained in the culture of Australian sugar cane agriculture. Virtually all the Australian sugar cane harvest is cut mechanically. The transition to mechanised harvesting occurred mainly during the 1960s; in 1964 24% of the total crop was cut by machine, by 1973 99.6% was being harvested mechanically (Lance Jones & Co., 1975). However, whilst all the crop is cut mechanically few farmers own their own harvesters. In 1990, there were some 1,300 mechanical cane harvesters in Queensland, one for every five farms (Queensland Sugar Corporation, 1992a).

A sophisticated cane transport and sugar handling infrastructure exists throughout the cane producing areas of Australia. In Queensland there are, for example, some 3,900 kilometres of specialised narrow gauge railway which is used to transport cut cane from the fields to the mills. A number of bulk sugar export terminals exist along the north east coast of Australia. A total of 70,000 hectares of sugar cane land are irrigated in Queensland (Queensland Sugar Corporation, 1992a:7). Several areas benefit from specially constructed irrigation schemes. The Bundaberg-Isis irrigation scheme, for example, provides irrigation water for several hundred farms in the Bundaberg district who have no access to either the Burnett river or groundwater supplies (Hungerford, 1987). Australia also has a highly developed sugar industry research and development infrastructure spanning both the agricultural and milling sectors. In practice, cane farmers receive extension services from several agencies with distinct, but sometimes overlapping remits.

Most of the sugar mills which exist in Queensland today were established in the late eighteenth and early nineteenth centuries. Since then, progressive gains in mill productivity have consistently outstripped the growth in cane production, and consequently the number of mills has tended to decline. This trend continues today - five mills closed between 1986 and 1991. By the end of 1991 there were 28 raw sugar mills in Australia, 25 of which were in Queensland and 3 in New South Wales. The 3 mills in New South Wales were owned by a single grower co-operative. Of those in Queensland, 7 were owned by CSR Ltd (formally Colonial Sugar Refiners Ltd.), 6 by Bundaberg Sugar,

and 4 by the Mackay Co-operative. Most of the remainder are also owned by local grower co-operatives. CSR not only own a number of mills, it is also by far the largest sugar refiner and wholesaler in Australia, accounting for around 95% of domestic sugar sales. This company also act as agents for the Queensland government in the marketing of sugar overseas.

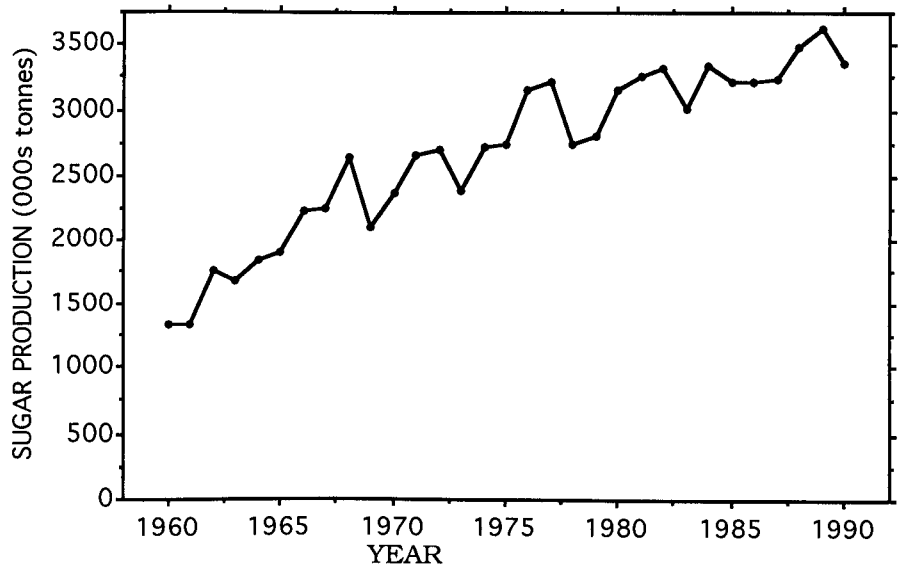
One official estimate suggests that in 1983 between 45,000 and 60,000 people were either directly or indirectly dependant on the sugar industry for full-time employment in Queensland (SCIST, 1989:6). In 1991, only 900 non family workers were employed full time on cane farms, but the milling sector employed some 6,000 people during the harvest season (usually around 21 to 22 weeks during the second half of the year) and somewhat less than 5,000 during the remainder of the year (Sugar Board, 1991:27). Although the numbers directly employed in the Australian sugar industry are not particularly high, they are significant in the context of rural Australia. The total population of Queensland is approximately 4 million, and almost three quarters of this total live in Brisbane, the state capital. Moreover, the sugar industry is highly geographically concentrated into a number of small areas which have a very high degree of dependence on this one industry. As one recent government report pointed out:

> "The sugar industry has strong regional effects on employment in some areas. A number of towns are essentially 'mill towns', for example Mossman, Hambledon and Tully. A number of regional areas are similarly dependent .... the Burdekin community is largely dependant on sugar cane for its income with approximately 80% of income in the district directly attributed to the sugar industry. Similar claims are made about other areas" (SCIST, 1989:6).

Whilst the sugar industry remains extremely significant at both regional and state levels, the total number of workers involved has been falling in recent decades. A trend to declining employment numbers became established in the late 1960 and has continued to date. The number of families involved in cane farming fell by around 20% between 1970 and 1985, and the number of people employed in the milling sector fell by over 10% during this same period (Powell and McGovern, 1987:29). Similar reductions in employment numbers in both the agricultural and milling sectors have persisted into the 1990s (Sugar Industry Commission, 1992:27). Although the Australian sugar industry now employs less people than it did in the past, production has increased steadily in recent decades. During the last thirty years output has more than doubled, rising from 1.3 million tonnes in 1960 to over 3.3 million tonnes in 1990, see figure 8.2. Much of the year on year variation in sugar

output indicated in figure 8.2 results from climatic effects on production. 'Plant crops', that is the first crop produced after cultivation, are the most susceptible to drought and under adverse conditions can fail totally. Ratoon crops are more resilient, but the c.c.s. or sugar content of the cane is often low when rainfall patterns have been sub-optimal.

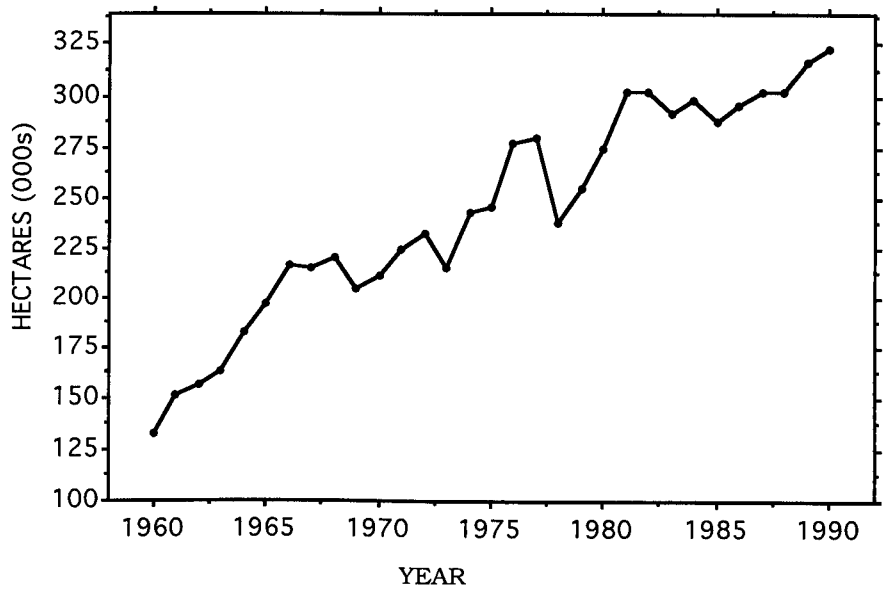
Figure 8.2 **Queensland Sugar Production 1960 - 1990**



Source: Queensland Sugar Corporation (1991b)

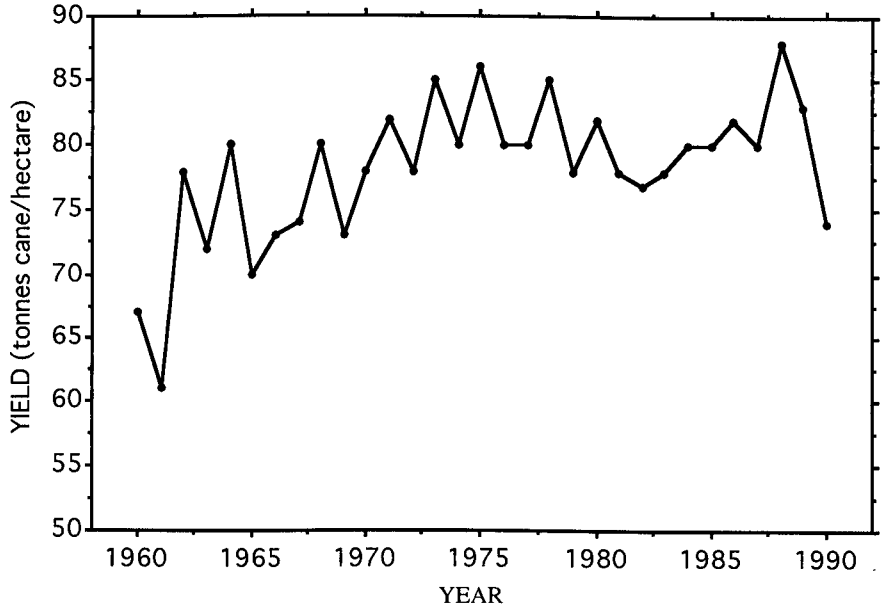
Most of the overall increase in output has occurred as a result of periodic increases in the area of land being used for sugar cane agriculture (see figure 8.3). Throughout this period, statutory controls have meant that sugar cane could only be grown on land 'assigned' to that purpose by the Queensland government. The area of land used for cane growing has increased progressively during the last fifty years as productionist policies have periodically led to increases in the amount of assigned land. Total land assignments which stood at around 300,000 hectares in the early 1970s, rose to around 330,000 hectares in the late 1970s and again to around about 360,000 hectares in the early 1980s. As figure 8.4 shows there has also been a trend to increased yields. Intensification of production is reflected in the fact that the proportion of assigned land actually harvested each year increased throughout this period, rising from 70% in 1970 to around 85% during the mid 1980s (see figure 8.5). The percentage of assigned land cut tends to fall following an increase in assignment because of the lag time involved in

Figure 8.3 **Queensland area of sugar cane harvested 1960 - 90**



Source: Queensland Sugar Corporation (1991b)

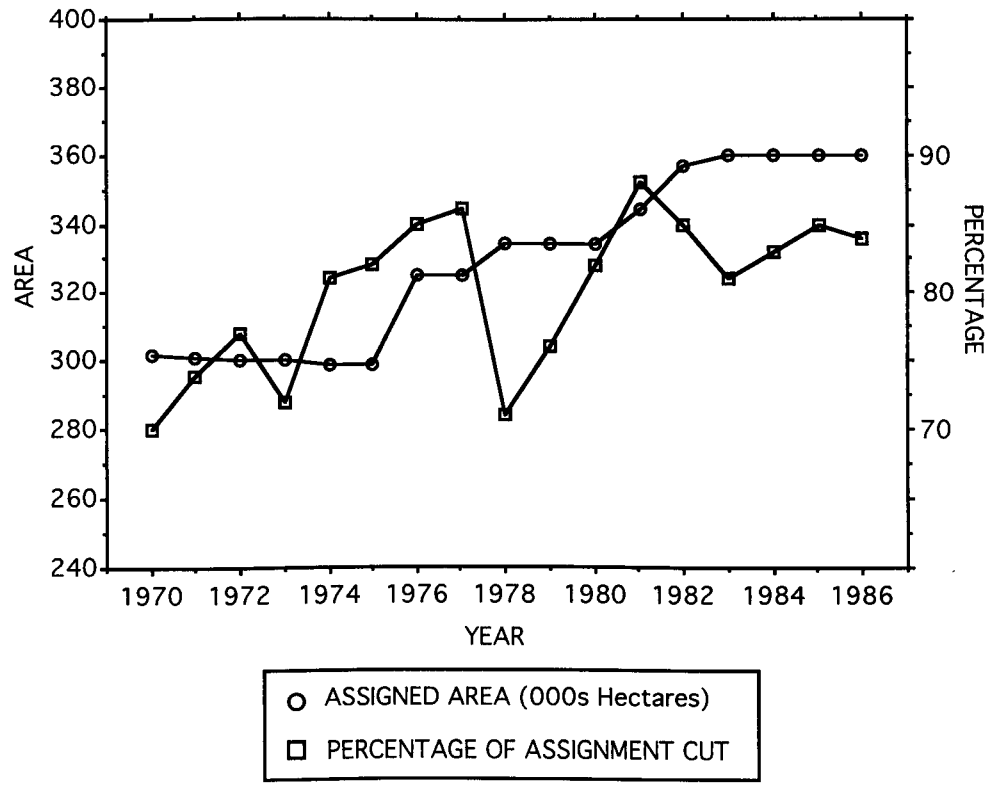
Figure 8.4 **Queensland tonnes of cane per hectare 1960 - 90**



Source: Queensland Sugar Corporation (1991b)

bringing newly assigned land into production. The very high percentage harvested in some periods may well reflect a tendency to extended ratooning. Certainly figures over 80% are not compatible with a ratoon length of four or five years. The high percentage of land being harvested during the early 1970s probably reflects attempts to capitalise on high sugar prices by deferring cultivation. Conversely, the similar situation which occurred during the 1980s, appears to reflect attempts to reduce cultivation costs during a period of very low returns.

Figure 8.5 **Area of assignments and percentage cut**



Source: Sugar Board (1991)

Sugar prices reached record high levels during the mid-1970s rising to around US$1,800 per tonne in 1974, and although they fell back to around US$600 per tonne in 1977/78 they had climbed again to over US$800 per tonne by the end of the decade. These relatively high prices underpinned a period of prosperity for the Australian Sugar industry, but this was short lived, Severely depressed prices which began in the early 1980s persisted throughout the decade and into the 1990s. The 'spot' price for world sugar which had stood at US25 cents per pound in 1980 fell to as low as US2.8 cents per pound in 1985. Throughout the 1980s, the world market price for raw sugar averaged

around US10 cents per pound. Notwithstanding the effects of Australia's protected domestic market and long-term export contracts, the returns received by the Australian sugar industry were similarly around US10 cents per pound throughout this period. This level of returns was often less than the costs of production. The cost of producing a pound of raw sugar in Australia between 1979 and 1985 has been estimated to range from A$10.96 cents to A$13.25 cents per pound or roughly US8 cents to US10 cents per pound (ABARE, 1985:5).

The exact numbers of farmers who experienced financial difficulties during this period is difficult to determine, but cash flow problems were certainly common. The average profitability of Queensland cane farms which peaked at A$75,000 per annum in 1980 fell to only A$12,000 in 1985. And it is clear that within this average large numbers of farms rapidly became sub-economic during the early years of the 1980s (Hungerford, 1987:82). A later survey undertaken by Gray *et al.* in 1992, indicated that around 60% of Central Queensland farms (over 80% of which were cane farms) were sub-economic at that time with the mean farm income standing at minus A$18,000. Less than 8% of Central Queensland farms had incomes over A$40,000 in 1992 (Gray *et al.*, 1993:41).

Although the low sugar price did produce a moderate increase in the number of cane farms being sold during this period, the level of such sales is a poor indicator of the viability of the agricultural sector. A significant number of farmers were caught in a negative equity situation and were thus unable to sell their properties. In practice, statutory controls on the prices at which farms might be sold allied to a sustained period of low farm incomes meant that many properties were virtually unsaleable.

8.3 **The Australian sugar industry regulatory system**

For the last seventy years, almost every aspect of the Australian sugar industry has been highly regulated. Statutory controls have covered not only the amount and location of land on which cane could be grown, but also whether or not that land might be sold and at what price. Farmers were also obliged to deliver their cane to a particular mill, and the framework for determining the price they would be paid was set out in legislation. The domestic market was protected and prices were fixed. Compulsory acquisition

powers covering all sugar production also underpinned a system of centralised marketing whereby all Australian sugar was sold through the state governments or their agents.

The basis of the regulatory system existing in the late 1980s, evolved during the first 30 years of the twentieth century. Import controls were first enacted at the time of federation in 1901 and subsequently extended during the First World War. The 1915 Sugar Acquisition Act led to the fixing of the domestic retail sugar price and the granting of monopoly acquisition powers to the Queensland government. In practice, the fixing of retail prices led directly to the fixing of the prices paid to sugar producers and to arrangements formalising the relationship between growers and millers. Further wide ranging controls over what land could be used for growing sugar cane were introduced during the 1930s.

The original rationale for regulation lay in what was seen to be the unequal relationship between millers and growers. But as one official enquiry into the industry pointed out, attempts to regulate this relationship led almost inevitably to a much more comprehensive regulatory system:

> "Regulation of the sugar industry has a long history in Queensland, dating back to the early years of this century when small-scale cane growers were seen to be 'exploited' by the milling interests. Over the years, regulations were expanded and extended in response to a variety of circumstances, often to overcome the adverse incentives and 'loopholes' created by the original controls. In time, a large number of major economic decisions have become subject to approval from some regulatory body or another. These regulations have become an integral part of how the industry is organised and operates, and a large section of the grower community is attached to them. Indeed, many find it difficult to envisage how the industry would operate in the absence of the rules and guidelines for behaviour provided by the existing regulations" (Sugar Industry Commission, 1992:40).

In practice, although the regulatory system which evolved was extremely comprehensive and in some ways detailed and complex, the basic instruments used were relatively straightforward. Essentially, these involved protection of the domestic market, the designation of production quotas to different sectors of the industry, and powers to control exports and to determine the returns received by producers.

Protection of the domestic market. The Sugar Agreement Act (1923) established an embargo on the import of sugar into Australia. Subsequent to

that date, all domestic demand for sugar has been met from Australian production at prices set by the Commonwealth government. Although the domestic price of sugar never included any great premium, this arrangement had several advantages for the Australian sugar industry. It provided a guaranteed market for a substantial proportion of total production, around 20% in the 1980s. And perhaps even more significantly, because the income from all sugar sales were pooled before payments were made to processors and producers, the relatively stable prices received for domestic sales served to moderate the impact of often violent fluctuations in the world market price.

Peaks. The principal control on the supply side of the industry was known as a 'mill peak'. Each mill was granted a mill peak or quota which represented a theoretical limit on the amount of sugar that mill could produce. In turn, each cane farmer using that particular mill was allocated a share of the mill's overall quota which was known as a farm peak. Designation of farm peaks effectively constituted a contract between growers and millers with the mill being obliged to buy the cane produced at a price established by a legislatively defined formula. The peak system functioned effectively because all sugar produced had to be sold into the state marketing system and production over peak would potentially, at least, receive prohibitively low prices.

Assignments. With the amount of sugar which a mill could produce being strictly controlled, it became necessary to control the number of growers who could supply that mill. With only a finite amount of production allowed, or more accurately only a finite amount of income available to the mill, any new farmers would inevitably prejudice the viability of existing producers. Such a scenario was avoided by restricting sugar cane agriculture to land specifically designated, or assigned, for that purpose. Such a system was enforceable because mills would only collect cane from assigned land.

Assignment could not normally be transferred from one piece of land to another. Because of this, much of the value of agricultural land existed in its assignment, rather than in the land *per se*. Consequently, further controls were established whereby assigned land could only be sold with the permission of the appropriate regulatory body who would determine not only whether a transaction could take place but also the price of the land.

Although mill peaks were periodically increased and the total amount of assigned land was adjusted in accordance with these, the established pattern

of assignments was seldom modified significantly. Increased mill peaks were traditionally divided amongst established assignment holders on a *pro rata* basis. Thus, apart from rare occasions when, for example, grants of newly assigned land were made to ex-servicemen, the only feasible way to become a cane farmer was to purchase land which held an assignment.

Pools. Pools were so named because all sugar produced in Queensland was pooled and marketed through a single agency with millers and, in turn, farmers receiving a *pro rata* share of the overall income. Payments for cane produced within peaks were calculated according to a formula not dissimilar in its operation to the 'A' and 'B' quota system operated with the EU (see for example Coote, 1987). In theory, the size of the number one pool was calculated to reflect the size of the domestic market and the amount of sugar being exported under contractual agreements. Thus producers could expect some degree of stability in the prices which they received for sugar sold within this pool. Conversely, the number two pool which would be sold on the world market would normally provide returns closely related to the prevailing world market price.

Somewhat incongruously, the prices paid for number two pool sugar were frequently not significantly lower than those paid for number one pool sugar. Indeed on occasions when the sugar market was particularly tight or when a sudden increase in the world price of sugar occurred, they could exceed those of the first pool. Moreover, given that a high proportion of farmers' costs were fixed, production in excess of peak was often a rational strategy. In practice, production exceeded mill peaks in every year during the 1980s despite the fact that world prices, and consequently number two pool prices, were depressed throughout most of the decade (Sugar Board, 1991:39).

Pooling arrangements have served to reduce some aspects of variability and uncertainty in the prices received by Australian sugar producers in two ways. First, all producers received a share of a single pool, so each producer received a mean price for the whole crop marketed that season irrespective of the particular market into which their own sugar was sold at. Second, and related to this, producers received a price which related to sugar sold over the entire year. This is significant because world sugar prices can change very rapidly and vary greatly within a single year.

In practice, for all the control exercised over the marketing of Australian sugar, the volatility of the world sugar market has been the key determinant of

sugar industry incomes. Long-term export agreements have provided relatively secure markets, but these agreements were negotiated within a context of structural overproduction and never included any great premium over prevailing market prices. The only significant protection from the depressed and unstable prices occurring in the international sugar economy came from controls on the domestic market and these only served to alleviate the most extreme variability in returns from exports. Since 1970, total sugar industry receipts have closely reflected the world market price for raw sugar which varied by as much as 73% from one year to the next. Because the prices actually paid to the agricultural and milling sectors were a direct function of total industry receipts, the gross incomes received by both growers and millers varied at the same rates as the total industry income throughout this period (Powell and McGovern, 1987).

The sugar industry regulatory regime functioned effectively because of the total inter-dependence of different sectors of the industry. This allowed a very high degree of control to be achieved through the use of a limited number of measures. For example, by controlling the output and incomes of the mills it was possible to delegate more detailed regulatory functions to this level. Thus actual government involvement in the day to day operation of the industry was never that great. The Commonwealth government's role was largely confined to strategic considerations such as international terms of trade. Most statutory controls on the sugar industry, for instance the designation of peaks and those affecting the single body marketing of sugar, have been enacted at state level, but in practice their operation has normally been delegated to various industry bodies such as milling companies. However, a number of governmental, quasi-governmental and producer organisations have been directly involved in the regulation of the Queensland sugar industry.

The Department of Primary Industries (DPI). The DPI is directly involved with the sugar industry in a number of areas. The DPI's principal area of responsibility is in environmental and water management - a remit which includes responsibility for industry specific issues such as nutrient leaching, cane burning, irrigation and water extraction policy. The DPI also has a responsibility for promoting efficient farm management, which according to the DPI involves "planning for sustainability and profit" (DPI, 1994). This department also administers the Rural Adjustment Scheme and other initiatives to help farmers experiencing economic problems.

Cane protection and prices boards. The Central Sugar Cane Prices Board was established by the Queensland government in 1915. Although the initial role of the Board involved ensuring an equitable distribution of income between the growers and millers, its remit was progressively expanded until it controlled virtually every aspect of sugar production and marketing. In 1933, the Board became responsible for controlling the area and distribution of land on which sugar cane might be grown. Allied to this it also controlled the price at which any assigned land might be sold. Indeed no assigned land could be sold or transferred without the Board's authority. In 1939, the Board undertook responsibility for determining and annually reviewing mill peaks. In theory, this Board also had responsibility for the acquisition and single desk marketing of all the sugar produced in Queensland. In practice, the administration of the marketing system has been devolved to CSR Ltd.

Local sugar cane prices boards. Every operating mill had a local sugar cane prices board which undertook detailed regulatory functions at a local level. Local boards met each year to determine the farm peaks, i.e. the way in which the mill peaks were divided amongst the farmers assigned to that mill. Local boards also administered the division of receipts between the milling and agricultural sectors and amongst individual farmers.

The Bureau of Sugar Experiment Stations. The Bureau of Sugar Experiment Stations (BSES) is the principal research, development and extension agency operating within the Australian sugar industry. The BSES develops new cane varieties, has responsibility for disease control, and evaluates new technologies within the industry. The Bureau is the largest provider of extension services to sugar cane farmers (BSES, 1992).

Canegrowers. Although funded by a statutory levy on sugar production, Canegrowers is essentially a producer organisation which represents the interests of cane farmers. All cane farmers are members of Canegrowers which undertakes a number of responsibilities on their behalf. At a strategic level, Canegrowers lobbies government and negotiates with large milling interests. At a local level Canegrowers also provides a range of extension services and will undertake a range of administrative functions such as book-keeping for those farmers who choose to use these facilities.

Other institutions. A number of other organisations, such as the Australian Sugar Milling Council, the Sugar Research Institute and the Sugar Research

and Development Corporation, are also involved in the sugar industry. A less industry specific, but nevertheless highly significant role was also played by the banking sector. Following the privatisation of the state Agricultural Development Bank in the 1970s, neither Commonwealth nor the State governments have had any great involvement in the financing of the sugar industry. Virtually all capital requirements have been financed through private banks.

8.4 **De-regulation**

Deregulation of the agricultural sector has been part of wider Australian government policy for some years (Lawrence *et al.*, 1992; Alston, 1991). Australia's near neighbour New Zealand has pursued similar policies (Cloke and Le Heron, 1994). The sugar industry was the last major sector of Australian agriculture to undergo deregulation. However, by the late 1980s a comprehensive programme of deregulation of the sugar industry was being instituted. Given the extremely high level of regulation which had previously pertained, deregulation has involved profound and potentially highly significant transformations.

One of the initial steps in the deregulatory process was the discontinuance in 1988 of the embargo on sugar imports, which had existed since the 1920s. This was replaced with a system of import tariffs which are to be progressively reduced. Even when the last tariff protection is eliminated in the late 1990s, this is unlikely to produce any importation of sugar into Australia because of the transport costs involved. However, the concurrent termination of the arrangements covering the supply and pricing of the domestic market could be more significant. In theory, this might produce a competitive market with a consequent reduction in the price paid to producers. Certainly the Sugar Industry Commission (1992) suggested that domestic consumers were likely to benefit from price reductions. In practice, with one refiner supplying well over 90% of the domestic market significant retail price reductions are perhaps unlikely to occur. Of more concern to producers is the prospect of CSR being in a position to play off one supplier against another and thus reduce returns to the milling and agricultural sectors.

In 1991, the Queensland government passed the Sugar Industry Act which effected a major revision of the legislation and associated administrative

arrangements affecting the Queensland sugar industry. One major outcome of the Act was the formation of the Queensland Sugar Corporation which absorbed the marketing responsibilities of the Sugar Board and the regulatory functions of the Central Sugar Cane Prices Board. The remit of the Corporation includes: "development and implementation of policy relating to the management of the Queensland sugar industry; managing and regulating the quantity and quality of sugar cane and raw sugar produced in Queensland; marketing each season's raw sugar distributing the proceeds from the sales of raw sugar" (Queensland Sugar Corporation, 1992a:42). Under the provisions of the Sugar Industry Act, the assignment and peak systems remained essentially intact, although some of the more far reaching controls, such as those relating to the sale of assigned land, were discontinued. Determination and administration of peaks and assignments became the responsibility of the Queensland Sugar Corporation who extended the total amount of assigned land by 8% in 1991, and scheduled further increases of 2.5% for each year up to 1995.

In March 1991, some years after the deregulatory process had been initiated, the Australian government ordered the Sugar Industry Commission to consider the future of the sugar industry. The terms of reference given the Commission included the requirement that they should "review production, institutional, regulatory or other arrangements subject to influence by the Governments in Australia .... and identify any further initiatives which will raise overall economic efficiency" (Sugar Industry Commission, 1992:xiv). The Commission's report published in 1992 argued strongly in favour of continuing and extending the deregulatory programme. It cited several arguments to support this conclusion. These included the suggestion that both the international environment in which sugar was exported and the nature of the industry itself had changed significantly since the regulatory framework had been established, and the fact that regulations applying to other sectors of Australian agriculture had already been relaxed or removed.

The Commission also argued that the regulatory system had imposed a number of specific costs on the industry and the Australian economy. It was suggested that the expansion of the industry had been inappropriately constrained and that potential exports had been lost. The assignment system had produced situations where cane was grown in sub-optimal locations while more appropriate, potentially more productive, land was not utilised. Restrictions on the transfer of assignment had prevented a restructuring of

the industry in which the scale of production units would have increased to take advantage of potential economies of scale. The constraints of the regulatory system were also claimed to have stifled innovation amongst growers and promoted environmentally unsound practices including the overuse of chemical inputs and inappropriate reductions in fallowing. It was also suggested that controls on marketing had imposed a cost on Australian sugar consumers of around A$1000 million per year (Sugar Industry Commission, 1992).

The Sugar Industry Commission proposed a range of further deregulatory measures which they suggested would represent "a major departure from current arrangements" (Sugar Industry Commission, 1992:6). These recommendations included removing all remaining administrative constraints on the area and location of cane growing; allowing growers and millers to negotiate the terms of their relationship themselves; the development of competition between multiple sellers of sugar on the domestic market and the development of new arrangements for pooling and marketing sugar. In the Commission's words these changes would enable "growers, millers and marketers to evaluate alternative strategies and enter into those arrangements which best suit their individual needs. Competitive pressures would provide a strong incentive to ensure that the production and marketing activities are undertaken as efficiently as possible" (Sugar Industry Commission, 1992:6).

Most of the deregulatory measures proposed by the Commission are either currently being put into practice, or are planned for the near future. The only real area of uncertainty regarding the extent of the de-regulatory process lies in the question of whether the single desk marketing arrangements for Australian sugar continue beyond the short term. The Commonwealth government appears to favour a total deregulation of the industry including the abandonment of the unitary marketing arrangements. There are, however, strong arguments that the existing arrangements for single desk marketing or something effectively very similar should be maintained (Queensland Sugar Corporation, 1992c).

Although there is general support for some elements of the current de-regulatory programme, in particular for the abolition of many of the detailed controls over what are seen as trivial and insignificant features of the industry, both farmers and the milling sector are aware that deregulation is likely to create new pressures and problems within the industry. Various

actors within the industry tend to be both sceptical of the reasons for deregulation and concerned about the possible implications of deregulation for them as individuals. Deregulation, or perhaps more precisely the scale of the proposed deregulatory agenda, has been seen by some involved in the industry, not least by most cane farmers, as being somewhat ill-conceived given the fact that the established Australian sugar industry is widely perceived to be amongst the most productive and efficient in the world. This lack of enthusiasm for deregulation was noted by the Industry Commission who acknowledged that, "it is easy to understand why many in the industry supported regulation" (Sugar Industry Commission, 1992:2). One widely held view is that the deregulation of the industry simply reflects the ill-considered application of an increasingly neo-liberal political agenda to Australian agriculture. Another point of view is that the Australian government has effectively backed itself into a corner through its criticism of other sugar producers. Certainly, the Australian government has been extremely vocal, for example as a leading member of the 'Cairns Group' (Miller, 1987; Jesson, 1991), in its advocacy of reforms to international trading arrangements and its criticism of the protectionist policies pursued by many foreign governments. The suggestion being that because of the stance which the commonwealth government has taken over these issues, it has felt obliged to 'put its own house in order'. In effect, its has been obliged to dismantle the tight regulatory framework within which the sugar industry had operated.

8.5 **Case studies: Bundaberg and MacKay**

The early 1990s may well prove to have been a highly significant period for the Australian sugar industry. The 1980s had seen a sustained period of depressed sugar prices, during which almost all cane farmers experienced financial difficulties and many ceased to produce cane. By 1994, incomes were beginning to rise as small increases were occurring in world sugar prices, but a range of problems which had been accentuated and brought to the fore by the conditions which prevailed during the 1980s have persisted. Moreover, uncertainty about the scale and nature of the deregulatory process and the effects which it is likely to produce have become a major cause for concern. Whether the de-regulatory process will produce a more efficient and competitive industry remains to be seen, but irrespective of this, it seems inevitable that there will be both winners and losers as the changed context within which the industry operates induces a period of restructuring.

Bundaberg and MacKay are two of the major sugar producing regions in Queensland. They are in many respects typical of the sugar producing regions found throughout the state. Certainly, the farmers in these two regions have experienced many of the same problems which have been common throughout the industry over recent years. Equally, however, both of these regions have a number of unique features. For example, the Milling sector in Bundaberg is controlled by a private company whereas in Mackay it operates as a co-operative. There have also been interesting differences in the coping strategies adopted by the cane farmers in the two locations.

The first cane sugar produced in the Bundaberg region was grown on the banks of the Burnett River in 1882. By 1900, a significant industry had developed around a number of large centralised mills. The local industry continued to expand throughout the twentieth century and by 1991, 47,934 hectares of land were assigned to sugar cane and the region held a peak of 400,400 tonnes of sugar - 12.6% of total Queensland production. In 1992, there were approximately 830 individual cane farmers in the Bundaberg region. The average size of individual holdings stood at just over 60 hectares (Bundaberg Canegrowers, 1991:2). Many local farmers experienced severe difficulties during the 1980s when sugar prices remained consistently depressed. Cane production which had stood at over 3.1 million tonnes of cane in the early 1980s had fallen to just over 2.5 million tonnes by the early 1990s by which time sugar production was approximately 7%, below peak (ABARE, 1991a).

Fairymead, the first sugar milling company in the Bundaberg district, was established in 1880. Several other sugar milling companies also came into existence during the 1880s. Initially the Fairymead company had quite diverse agricultural interests, including cattle production, but sugar and related activities soon became its central concern. Fairymead became a public company in 1912 and was to play an increasingly central role in the development of the local sugar industry. Fairymead changed its name to the Bundaberg Sugar Company Ltd. in 1972 after merging with another local sugar company. The newly formed Bundaberg Sugar Company subsequently acquired a number of other companies involved in the production of sugar and related industries. By the 1980s, Bundaberg Sugar owned all of the sugar mills in the Bundaberg area, was a major rum producer and Australia's second largest sugar refiner. Although the majority of the 5 million tonnes of

sugar cane produced in the Bundaberg area each year is grown on relatively small family farms, Bundaberg Sugar is almost unique in that the company owns and farms quite large estates in its own right. In 1993, the company owned over 7,000 hectares of cane land on which it produced over 400,000 tonnes of cane.

In 1991, Bundaberg Sugar was acquired by Tate and Lyle plc, a British sugar multinational. Such a development would not have been possible prior to this date because of a statutory ban on any foreign ownership of assets in the sugar industry. Tate and Lyle's take-over of Bundaberg Sugar was received with some considerable misgivings by many of those involved in the local sugar industry. Local cane farmers, in particular, have been concerned about the implications which the take-over might have for them. Although Tate and Lyle are a major sugar multinational with interests throughout much of the world, the reasons for their interest in Bundaberg Sugar are somewhat unclear. It may be that Tate and Lyle have some interest in gaining a foothold in the supply of refined sugar to the domestic Australian market, but this is relatively small market and Bundaberg sugar has a much smaller market share than CSR. It would appear more likely that Tate and Lyle see Australia as a possible entry point into the supposedly rapidly developing Asian market for refined sugar. Alternatively, many sugar cane farmers and millers in Queensland fear that foreign companies such as Tate and Lyle may simply be involved in an asset stripping exercise. Bundaberg Sugar, and several of the other milling companies in Queensland are relatively asset rich and it may well be that a company with the inclination and resources could make considerable short-term gains in this way. In practice, however, since becoming established in Queensland, Tate and Lyle have attempted to expand their interests through the acquisition of other milling interests in the state. This has proved to be a difficult process as they have encountered quite considerable opposition from various sectors of the industry. For example, the members of at least one sugar co-operative in northern Queensland voted overwhelmingly to reject a take-over in 1994.

Sugar cane agriculture in the Mackay area extends for fifty of so kilometres inland along the Pioneer river Valley. As is the case with most sugar producing regions in Queensland, sugar production began here in the second half of the nineteenth century and has continued to expand since then. In the early 1990s there were approximately 1,200 cane farmers producing cane on approximately 125,000 hectares of assigned land in the Mackay region

(ABARE, 1991a:24). There are significant and well defined ethnic groupings, particularly of Maltese immigrants, within the local agricultural sector.

In 1991, the Mackay region produced over 600,000 tonnes of raw sugar which amounted to around 17% of total Australian production. However, this level of production was somewhat lower than had been achieved in previous years. In some areas production had fallen by as much as 40% compared to levels achieved in the late 1980s (Mackay Canegrowers, 1994). Some of this decline may have due to a number of low rainfall years, but the financial difficulties experienced by local farmers during the 1980s also appears to have been significant.

Sugar milling in this region is undertaken by the Mackay Co-operative of which all local growers are members. The present company was founded in 1988 when the five separate co-operative sugar milling operations which then existed were consolidated and rationalised (Kerr, 1988). The co-operative now operates four large mills which employ around 1,000 full time workers (Mackay Sugar, 1994). The Mackay co-operative is currently actively considering changing its status into that of a public company. The principle reason for this is that as a co-operative they face a number of technical problems in raising the capital which they believe is needed to finance future development. The co-operative is also currently engaged in a joint venture with the British multi-national R. D. and F. Man to develop refined sugar exports from Australia.

Potential and actual unsustainability

Queensland cane farmers operate in an environment where various forms of risk and uncertainty are omnipresent and highly significant, but what has been occurring in the sugar sector in recent years reflects more than the kind of short term problems caused by fluctuations the sugar price or the weather. The context within which the industry operates has become progressively more stressful and this has caused the extant industry structure to become increasingly unsustainable. On the one hand, the sugar price, fluctuations aside, has been declining in real terms for several decades. In parallel with this, the current structure of the industry has also been prejudiced by a range of internally generated contradictions including those which are undermining the viability of the family farm. By the late 1980s it had become increasingly

unlikely that either the existing regulatory framework or the sort of incremental technological advances which had sustained the established industry structure for almost a century would be sufficient to sustain it into the future. Indeed, these regulatory arrangements are now being disbanded and the Australian sugar industry is, apparently, entering a period of what may well be quite profound restructuring.

The progressively unsustainable levels of stress which pre-empt a period of radical restructuring are currently being experienced throughout the Australian industry. Whilst many of the pressures faced tend to be common to both of the case study locations and indeed throughout the industry as a whole, some problems are more place specific, as have been many of the responses adopted. Indeed both pressures and responses differ quite markedly not only between one sugar producing region and another, but also within individual regions. In practice, while the nature of sugar cane agriculture and a highly prescriptive regulatory system has produced many elements of commonality amongst producers, significant differences remain in both the practices and the productivity of both cane farmers and the millers. As one study of the industry pointed out:

> "While cane growing occurs on a large number of small farms, there is considerable diversity both in the mode and efficiency of operation as well as in the effective return obtained. This is due to both general factors such as weather and seasonality, and also to individual features of the farmer, his operation (for example, the use of contractors or his own labour and plant) and his land. Performance does vary to a great, and probably unexpected, extent .... Similarly, there is a variation in mill situations and performances. While behaviours and modes of operation differ little between mills (there is a generally uniform use of technology and techniques), their financial position and state of development differ ...." (Powell and McGovern, 1987:9).

In practice, it is also usually the case that the problems which have emerged within the Australian sugar industry have more complex causes than is sometimes stated. Certainly, individual farming enterprises have tended to become unsustainable as a result of a combination factors, although these are often inter-related. As one DPI official suggested:

> "Policy makers always like to look for one explanation, perhaps to say that it was dry land farmers with poor management experience. But financial problems can come from things like family break up at the wrong time; purchasing a property at the wrong time and taking on a great deal of debt; or poor management. And its never just one, its usually a combination. Locally, there were particular areas which didn't get rain. Some growers were preoccupied with taxation and had absolutely everything on lease so the level of fixed

commitments going out was ridiculous. Another problem is with succession, where they are trying to get their son or sons onto the farm and having too many families reliant on too small a farm" (personal communication, DPI Farm Financial Advisor, Mackay).

Agronomic and environmental problems

Although a range of agronomic problems have been evident in Australian sugar cane agriculture, few farmers in either of the case study locations or indeed elsewhere have become unsustainable simply because of these. As is almost inevitable given the monocultural nature of sugar cane agriculture, farmers in Queensland have periodically faced a range of disease problems. A good example of this is the relatively widespread problem of ratoon stunting disease which affects the regrowth of ratoons (BSES, 1992:17). In practice, the usual response to disease problems in sugar cane is the development of new disease resistant varieties. Research and development including cane breeding and related extension services are well developed in Australia and the majority of farmers appear to be well satisfied with the manner in which new varieties are developed and disseminated. Whilst it is generally recognised that intensive monoculture is an inherently problematic form of agriculture (Buttel and Gertler, 1982; Cameron and Elix 1991; Burch *et al., 1992;* Hindmarsh, 1992*)*, there is a general belief in Queensland that any problems which do arise can be managed. The assignment system and the industry culture mean that few farmers have ever seriously considered deviating from traditional monocultural production techniques. When new practices have been adopted this has usually been done reluctantly and very much as a last option. For example, a number of Bundaberg farmers were more or less obliged to diversify during the 1980s, but this diversification generally reflected the pressures created by cash flow problems rather than any perceived advantages in a more diversified form of agriculture.

Drought is the one environmental constraint which affects significant numbers of Australian cane farmers. Rainfall patterns are highly unpredictable throughout the whole of Queensland and drought or variations in seasonality can have a significant impact on yields, particularly where irrigation is not used. The Mackay region was quite severely affected by a series of low rainfall years in the late 1980s and early 1990s. Although irrigation reduces some risks, it is not without its problems, In most cases charges for water are far from insignificant. In some areas, including both the

case study locations, there are also potentially significant problems of salt water intrusion into aquifers. The semi-arid climate and lateritic soils of central and southern Queensland are also such that salinisation can be a problem, although only moderate amounts of land have been severely affected to date.

Bundaberg is one of the drier sugar producing areas in Queensland with average rainfall varying from 1,039mm in the western sector to 1,114mm per annum in the east. Over 95% of the land in the district is irrigated. Land along the Burnett river is normally irrigated using water from that source. Most farmers who do not have access to the river have traditionally pumped water from an aquifer which underlies much of the region. A series of low rainfall years during the 1960s and concerns about over-extraction from the aquifer prompted the development of the Bundaberg-Isis irrigation scheme work on which commenced in 1970. One local cane farmer explained the need for this scheme:

> "Nearer the river it started to get salty, and it was gradually spreading this way. So if we hadn't gone on to surface water from the dam, there would be no irrigating at all. It was a bit too late for some down that end, but here, some of them growled that they still had good water, but the salt was spreading it was getting further and further. You only had to get a dry year and we would get it here. They just over-watered. Once the salt got in there was nothing to do. We pay quite a lot for it, but you know that the quality of the water is good" (personal communication).

This was a major scheme intended to provide irrigation water throughout most of the Bundaberg district. However, progress in construction has been slow and the scheme remains incomplete, not least because successive governments have equivocated over the costs involved (Hungerford, 1987). Those elements of the irrigation scheme which are operational have allowed more farmers to irrigate and this has reduced pressure on the aquifer, but current levels of groundwater extraction still remain above replenishment rates in some areas.

As with most aspects of sugar cane agriculture, water extraction rights and charges have been subject to a considerable degree of regulation. Farmers are allocated a quota of water according to the size of their assignment. This basic quota must be paid for irrespective of whether it is used and extraction beyond this quota is charged at prohibitive rates. Historically, most cane farmers used flood irrigation techniques, however, a transfer to drip irrigation is currently being strongly promoted by both the DPI and other regulatory

bodies. A large number of farmers are now adopting this technique. Although policy here is tending to move towards various forms of demand management, such as the adoption of more efficient irrigation techniques, such measures are still embedded within a positivist, modernist interpretation of development. Both the regulatory agencies and the farming community have an almost unquestioning faith in potential of technology to solve any agronomic or environmental problems which emerge (see for example, Bundaberg Cane Productivity Committee, 1993). Moreover, development strategies for the sugar industry are still formulated within a context defined by the fundamentally productionist ethos of wider agricultural policy (Wheelwright, 1990; Lawrence and Vanclay, 1992:33).

The long established productionist philosophy of the Australian government and the nature of the sugar industry regulatory system have combined to produce increasingly intensive farming methods throughout the sugar industry. Farmers have been encouraged to increase production on finite amounts of land and this has, almost inevitably, led to high levels of fertiliser, pesticide and herbicide use. This trend has often been accentuated by the strategies adopted by many farmers in response to the cost-price squeeze situation such as occurred during the 1980s. When faced with low sugar prices, the initial reaction, at least, of many farmers appears to have been to attempt to further increase yields.

The highly intensive, chemical dependant, nature of Australian sugar cane agriculture is somewhat at odds with that country's widely promoted 'clean and green' image and an increasingly influential, and often government supported, environmentalist movement (see for example, Campbell, 1989; Cock, 1992). In practical terms however, pressure from green movements has had little direct impact on Queensland cane farmers or the milling industry. In part, this may reflect the very high dependence on this one industry in sugar producing regions such as Bundaberg and Mackay. The problems associated with cane burning - large amounts of smoke and ash deposits in adjacent areas, for example, are normally considered to be a minor and necessary inconvenience by populations whose livelihoods are dependent on the industry. The DPI is currently promoting a change to cutting green cane rather than burning fields before harvesting, but this is because green cane harvesting is now perceived to have agronomic advantages rather than because of pressure to change from outside the industry. The effects of nutrient leaching on the Great Barrier Reef are seen by both the green

movement and the regulatory authorities as a potentially significant problem. Runoff of agricultural fertilisers and effluent from sugar mills are both considered to be major contributors to the overall problem. That said, there is little evidence that either the mills or the farmers have faced any real pressure to moderate their practices because of this. In practice, the key problem for most cane farmers has not been the environmental impacts of current practices, but rather the economic implications of operating highly capital intensive production techniques in a situation of volatile and declining sugar prices.

Unstable and uncertain incomes

Historically, incomes within the Australian sugar industry have always been both highly variable and highly unpredictable. Uncertain incomes are problematic for the milling sector who need to raise capital and subsequently finance borrowing in order to develop their operations. Milling co-operatives face particular difficulties here in that they are more constrained in the ways in which they can acquire capital than proprietary companies. The Mackay co-operative, for example, sees the problem of being restricted to equity finance as a particular problem in a period of restructuring such as is now occurring because this makes them vulnerable to the expansionist designs of larger and better financed players (personal communication, Mackay Sugar executive).

A situation where incomes are insecure also creates extreme difficulties for individual cane farmers. Long term planning is at best an uncertain exercise and this creates particular problems where farm development is necessarily a long term exercise and, moreover, one which almost inevitably has to be financed over an extended period. In practice, even the most astute farmers tend to find that their actions are often determined more by unforeseen short-term pressures than any strategy for long term development. In both Bundaberg and Mackay the long term sustainability of many farming enterprises has often been prejudiced by short term pressures. As one Bundaberg cane farmer suggested:

> "You do your best to plan for the future, to develop your property. You listen to the experts and you do your best. You borrow money to stay up to date, to buy new blocks. You do what you are told and what seems right and then things change and you've got your back to the wall. Prices go right down and interest rates go right up. What do you do then? That is one of the worst parts of it. It wasn't because they didn't work. It makes them feel terrible because you can go on the dole and live on the beach, but these farmers, they

> worked hard, they worked long hours they were good farmers. And you know you must get some thoughts that maybe it was something I've been doing. We've got neighbours just here, they worked really hard, they were good farmers and they haven't made a cent. Its not as if they've done the wrong thing, its just the circumstances" (personal communication).

Debt

The year on year variability of sugar industry incomes is such that even the most efficient cane farmers need to balance years with high returns against those when little if any profit is made. The unusually long period of depressed prices and incomes which occurred during the 1980s, however, resulted in a very large proportion of Queensland's cane farmers experiencing a situation where they had little or no income for several years. Under these circumstances, it was not only the least efficient, least well managed farms which were threatened. In practice, large numbers of farms, which under less extreme circumstances would have been both highly productive and quite viable, were becoming unsustainable. The DPI's Farm Financial Services Advisor in Bundaberg estimated that his department had been involved with around 10% local cane farms each year during the 1980s (personal communication). A similar situation also existed in Mackay:

> "Personally, I was seeing around 125 farming families out of 1,500 in the central district. Between myself and Canegrowers we have probably seen at least 15% of canegrowers. Others were actually seeing their accountants, some relied on business friends and other more experienced canegrowers. There is no doubt about it, the sugar industry in the Mackay district went through a critical period 2 years ago. One more year would have seen unbelievable consequences" (personal communication, Farm Financial Services Manager, DPI, Mackay).

By 1992 well over half of Central Queensland farmers had debt to assets ratios over 20%, and in around a third of cases the ratio was over 40% (Gray *et al.*, 1993:40). High levels of borrowing, low incomes and interest rates which rose to almost 20% left many farmers with unsustainable debt burdens during the 1980s. Many were forced to sell their farms and even more were left in a situation where they could neither service their debts nor sell their properties either because they could not find a buyer or because the price available would not cover their debts.

In practice, farmers tended to have high levels of debt for one of several reasons: there were new entrants who had borrowed heavily to finance the purchase of a cane farm; there were those who had invested heavily in new machinery at the beginning of the 1980s; and there were those established farmers who had attempted to expand too fast by purchasing other farms. However, there seems to be little doubt that both the banks and the government bear some responsibility for the financial problems which developed within the agricultural sector. Both had positively and quite vehemently encouraged high levels of borrowing during the 1970 and early 1980s. On the one hand, advice from government consistently promoted both intensification and the expansion of individual holdings - 'get big or get out' had been the catch phrase of the 1970s. In parallel with this, however, the banks had not only encouraged farmers to borrow money, but in retrospect, they had clearly extended inappropriately high levels of credit to individual farmers. As one cane farmer suggested "the only trouble we have with our bank is that whenever we want a loan he'll let us have it" (personal communication). A DPI Farm Financial Advisor commented on the position adopted by the banking sector in these terms:

> "I really wonder about the banks and I have to deal with them all the time. They tend to work very much on short-term criteria. But what else can you work on because time and time again longer-term predictions have been proved to be wrong" (personal communication).

Over the last few years, the financial sector has modified its lending criteria regarding loans to cane farmers; moving away from equity based criteria to a policy of evaluating loans on the basis of income generation potential. While they are generally highly critical of the banks' original lending policies, most farmers believe that the banks adopted reasonably sympathetic approaches towards indebted farmers. In practice, of course, the banks' options were then very limited given that a very high percentage of individual farmers had debts which exceeded their equity.

When asked why local farming enterprises had become unsustainable, a very high percentage of interviewees in both case study locations made a clear distinction between those cane farmers with no debts and those with significant debt burdens. The suggestion being that those with no debts could withstand periods of depressed incomes simply by postponing any major farm purchases and perhaps cutting back on their personal expenditure. Whereas those with high levels of debt had little opportunity of remaining solvent

whatever type of strategy they chose to adopt. As one established cane farmer put it"

> "I came into it in 1950 so I had 30 years when it was a boom industry. There was never any doubt that I would survive. But if anyone had done the same thing as I did in the 80s they wouldn't have survived. By the time it got to the 80s I owned everything and I didn't have a debt. If I had done exactly what I did in 1950 in 1980 I would have really had problems .... there were a lot of them around here who bought farms for half a million dollars and they borrowed half of that. Within four years the farm was only worth a quarter of a million, the farm had halved. They still owed a quarter of a million. They had no equity at all. Those circumstances drove a lot of people into growing small crops. They were clutching at straws because they were in such a bad position .... Debt was the biggest thing. I think so. They got in it when it dropped virtually 100% in a couple of years and interest rates went from 12% to 24%. They didn't know it was going to happen, nobody did" (personal communication).

In itself, the suggestion that farmers with little or no debt were better placed to withstand a prolonged period of low incomes appears to be an obvious truism. A key point, however, is that large debts usually reflected measures undertaken with the objective of making the farming enterprise more productive, more efficient and more profitable. From this perspective, the point is more telling. The economic unsustainability of many farming enterprises appears to have arisen, more or less directly, out of the pursuit of 'efficiency'. Efficiency which was almost invariably understood in terms of technological development and modernisation.

Technological treadmill

The Australian sugar industry has to compete with a number of other sugar producing countries within the world sugar market. Many of these producers, such as Thailand, Cuba and Brazil, are low wage economies. Others such as the EU give their sugar producers significant amounts of protection and support. Australian wages are amongst the highest in the world and sugar producers receive little if any direct support from the government. Given this context, the Australian industry sees its one comparative advantage in being able to develop and adopt new technology more readily than other sugar exporting countries. Certainly, this seems to be the position of the Queensland government:

> "The responsibility is your own. If you want to be a better farmer you have to be determined, the tools are there to assist and help

you. We do our best in the research area. The BSES and other research groups have the responsibility to help to bring in modern and better farming systems and also cane varieties that can give you better productivity. That role has really not changed since the early days of the BSES, but what has changed is the technology and the ways in which it can be implemented. There is not one of you who is operating on the farm in the same way as did your parents in time gone by because you must move with the times .... The fact that we will have over 4 million tons of sugar this year has been because of proper planning and new legislation that the government has promoted in conjunction with the industry. That is what it is all about today, the new technology you see here today is all designed to help you lower your cost structure in some way or another. Because margins are shrinking - they are nowhere near what they were years ago. Because we are growing for overseas consumers our cost structures are for ever and a day going to be determined by those overseas prices .... the alternative is that 4 out of every 5 cane farmers would have to go out of the industry. Our package is designed to lower that cost structure. One of the biggest problems for farmers is that you are constantly adopting to change, to changes in other areas. But by adapting your farm you also ensure that you adapting you livelihoods. So we must keep up the research and extension work .... You have got to have the will, the understanding and the inclination to want to move yourself down a better track" (Queensland Minister of Primary Industries, Speech to Mackay cane farmers, April, 1994).

Although this perception of Australia's international position is perhaps a valid one, such a strategy is not without problems. Indeed, the techno-fix ethic which pervades the Australian sugar industry is in many ways analogous to reliance on progressive technical innovation which forms a central tenet of neo-liberal thinking on sustainable development. In both cases, it is far from clear whether this can in practice form the basis of a truly sustainable system.

Many of Australia's international competitors now have both low wage economies and access to increasingly sophisticated production technologies. Beyond this, however, constant pressure to improve efficiency, to adopt new production techniques, to use more modern technology, can also be problematic in other ways. Modernisation of the milling sector can be very expensive, especially for some of the relatively small companies and co-operatives operating in Queensland. Constant pressure to modernise also places profound and sometimes overwhelming pressures on the agricultural sector. A good example of the problems involved in this is provided by the current promotion of drip irrigation. A significant number of farmers in both Bundaberg and Mackay are currently changing traditional flood irrigation techniques to drip. One Bundaberg farmer was clearly enthusiastic:

"Sugar production can only be made profitable through technology which will give me a significant vertical expansion. We are installing

> trickle right through the farm .... there are large areas of land suitable for trickle here and an extra million tonnes of cane is achievable in the three Bundaberg mill areas. It is a very attractive commercial proposition, there is an enormous financial attraction in the $45 million of extra revenue this would produce .... some people dither because they believe that the technology may involve some pitfalls, but there are none, its out there for them to see. The only problem is that too many farms are too small to finance installation" (personal communication).

A move to drip irrigation may appear rational in that it reduces pressure on scarce water resources, indeed it clearly is rational from this perspective. In practice, however, pressure to adopt such technology has been a significant causal factor underlying the unsustainability of many farming enterprises. As a less easily persuaded cane farmer commented:

> "At the moment in Bundaberg there is a thrust towards trickle irrigation. Now the capital inputs into trickle are enormous. And you really are taking a gamble, particularly in some areas. The running costs are cheap and the efficiency are good - you can run with low pumping costs and also introduce chemicals and nutrients right to the stool with no waste, but the capital outlays are enormous. They talk in terms of around $2,000 per acre. Well if you have got a 250 acre farm its almost the value of the farm again. You have got to know that you can handle that. And some people do get into trouble. The guy who sits on the fence, he may put a patch in but carries on with the rest, he's the survivor" (personal communication).

As this comments implies, the events of recent years may have given cane farmers good cause to be circumspect, but it still tends to be the speed of modernisation which is questioned rather than the process itself. This is perhaps somewhat surprising given that so many farmers now have unsustainable debts because of inappropriate investments in technology.

Pressure to modernise and expand production tends to cause unsustainability because of the economic costs involved, but it can also prejudice the sustainability of farming enterprises in other ways. Modernisation frequently involves more than the mere purchase of new machinery or the adoption of new production techniques. In practice, it may well mean that a farmer has to acquire new assignment if these investments are to be used efficiently. Certainly the pressures to increase farm size appear clear enough to many of those working in the industry:

> "If it cost $24,000 per year personal expenses, for someone growing 3,000 tonnes which is about the average Millaquin cane farm, that means that they have got to take $8 per tonne profit to live. We are growing 8,000 tonnes and it still only costs us $24,000 to live, so

> out of the crop we only have to take $3 per tonne. So when the guy that is growing 3,000 tonnes is breaking even, we've got $5 per tonne left and on 8,000 tonnes and that is $40,000. When the other bloke is breaking even we've got $40,000 profit" (personal communication, Bundaberg canefarmer).

Queensland cane farmers have also been directly affected by modernisation of the milling sector. During the early 1990s, many Queensland mills have been transforming their operations from the traditional pattern of daytime only working to what is known as 'continuous crushing'. Traditionally, cane cutting stopped in the early evening and neither the farms nor the mills worked during the night. Under a continuous crushing system, cane must be harvested during the evening to ensure the mills with adequate supplies throughout the night which is technically much more efficient. The nature of sugar cane production is such that if a factory changes to continuous crushing, all the farms in its area must adopt new harvesting practices. In practice, extending the working day from early morning to late evening can create very real difficulties for a small family farm which relies exclusively on family labour.

Problems of the family farm

For almost a century the family farm has been the key structure of the Australian sugar industry. The flexibility and potential for self-exploitation inherent in a family farming system has a number of distinct advantages which have been significant in allowing the Australian sugar industry to remain sustainable. For example, farms which rely entirely on family labour are well placed to withstand the profound year on year differentials in income created by the extreme volatility of the global sugar economy. Incomes may be very low during some years, but with very few expenses necessary for the running of the farm, especially when any capital projects are deferred, farmers can and do simply tighten their belts and survive until a price upturn increases their incomes (see for example, Friedmann, 1985). However, as is the case throughout Australian agriculture (Lawrence *et al.*, 1992; Hindmarsh, 1992), the future of the family cane farm now appears to be increasingly insecure within the sugar sector. This situation is inherently contradictory. Although the family farm has a number of distinct advantages as the basis of the sugar industry, the sustainability of these enterprises is constantly being undermined by pressures to increase efficiency. In practice, this frequently involves high levels of capitalisation and progressive increases in the

minimum size of viable farm units, both of which have tended to make family farms inviable and unsustainable.

Whilst the family farming structure certainly seems to have been significant in allowing the Australian sugar industry to be sustained for almost a century, the situation is perhaps not quite so straightforward as it may at first appear. One government official provided a very two-edged appraisal of the potential for self-exploitation and flexibility provided by the family farming structure:

> "What you do find is that when things get tight, economists and bankers like to think of outgoings as variables and fixed costs and there are no such things. It doesn't hold, everything became discretionary. People seem to be able to find more money from various sources including RAS and including social security and they look to their own resources - selling assets, selling blocks of land, we have certainly seen lots of that. Bearing in mind that the sugar industry is concentrated on the coast and of prime real estate value, what we are seeing is urban encroachment becoming a major and growing problem which is going to effect the viability of some of the mills in the area. What they are doing is chopping off their foot to save the leg. But, its not sustainable. You can't keep doing it" (personal communication, DPI worker, Mackay).

What this official is suggesting, albeit implicitly, is that the problem is not simply one of surviving year on year fluctuations in income. Rather the implication is that incomes have tended to fall progressively. In this situation the family farm (and indeed any other production structure) will inevitably become unsustainable irrespective of whatever measures are taken to offset immediate financial problems.

In practice, however, it has not been just the increasingly tight economic situation which has served to undermine the family farm. For example, inter-generational transfer has tended to create a range of problems. On the one hand, many children of cane farmers appear to be somewhat indifferent to the prospect of taking over the family farm and the risks and insecurity which this entails. As one Bundaberg cane farmer suggested:

> "A lot of the younger blokes, the sons of the farmers can see that its not a certain future, so they'll go and do something else, whatever town people do. And its something to do with the type of society we've got now. Its a lot of hard work on a cane farm, the younger ones use their brains a bit, go to college, and get themselves a cushy job in an office and get three times the pay. They can see that. Its better than seven days a week, daylight to dark (personal communication).

A Mackay cane farmer evaluated the situation in these terms:

> "They have jokes in these Canegrowers things we get, there was joke in one: the kid was playing up, and the dad said if you don't stop playing up I'll leave you the farm. There is a lot of them like that. People didn't want their kids to stop on the farm because they had had such a hard life. The tendency is for the kids to go away, and the farmers are getting older and older. The younger ones can't afford to buy the farm. The Older ones don't want to make them stay" (personal communication).

Many older cane farmers are first generation farmers and there does not appear to be any great tradition or cultural disposition to continue the family farm. Even where children are committed to the farm, however, there are a range of practical problems. Several of these problems either arise directly from or have been accentuated by the nature of sugar industry regulatory system.

Because most farms are of such a size that they can only provide sufficient income to support one family, established farmers tend to be reluctant to transfer ownership to the succeeding generation until they are able to provide some form of retirement income for themselves. Thus children are often obliged to obtain employment off the farm until well into middle age, by which time they may not wish to return to farming. Similarly, the relatively small nature of many farms means that partible inheritance has not been a realistic option for most cane farmers. In practice, a significant number of farming families have been more or less obliged to adopt a strategy of expansion to allow either single or multiple children to work on the farms whilst the parents were still too young to retire. Such strategies have often proved to be problematic for the families concerned. Many families, especially those who have attempted to expand their holdings rapidly, have experienced severe financial problems. Borrowing to finance the purchase of new land in order to incorporate children into the family business appeared to have been a major cause of unsustainable debt in both the case study locations.

The problems associated with intergenerational transfer of cane farms are reflected in the distorted age structure which exists within this sector. One survey conducted in 1992 identified the mean age of cane farmers in Central Queensland as 56 years, with less than 10% being under 30 years of age (Gray *et al.*, 1993:43). Such a structure is seen as being problematic for a number of reasons. Not the least of these is that the long term sustainability of the industry would seem to be dependent on the effective reproduction of the ownership structure and labour force. In practice however, figures regarding age structures on cane farms may be misleading. For example, it is

common for the father to retain official title to a property long after the effective running of the farm has passed to his children.

Impacts of Deregulation

In evidence to the Sugar Industry Commission, growers' representatives argued that deregulation was likely to result in farmers being disadvantaged because of the effective monopoly which mills have in particular cane growing areas. Conversely, the milling sector expressed concern about the power of organised grower groups (Sugar Industry Commission, 1992). Other submissions to the Commission suggested that continued regulation was necessary

> "to ensure orderly expansion that is within the capacity of the industry infrastructure and does not threaten the position of those within the industry .... to provide a means of co-ordinating the scheduling of harvesting and delivery operations in a manner which is equitable between growers .... to protect growers, potential growers and millers from investment decisions that may not be viable .... to protect mills from the threat of closure through significant volumes of assignment being transferred out of the mill area; and to preserve and increase industry per unit returns" (Sugar Industry Commission, 1992).

The basis of most considered opposition to deregulation lies in the contention that the nature of sugar production is such that this industry requires regulation for reasons which would not apply in the general case. The suggestion being that the functional interdependence of different sectors of the industry necessitates a high degree of co-ordination between different stages of the production process. For example, harvesting needs to be precisely timed and co-ordinated to ensure a steady and continuous input to the mills. What concerns many within the industry, is that the inherently unequal relationships which exist between different sectors of the industry hardly appear to be a suitable basis for self-regulation. Growers' concerns have been accentuated by the entry into the industry of foreign companies such as Tate and Lyle in Bundaberg and on a smaller scale the British commodity trading company E. D. & F. Man, who are involved in a joint venture with the Mackay co-operative.

In practice, almost everybody involved in the Queensland sugar industry appears to be concerned about the possible effects of the current deregulatory programme. On the one hand they are concerned because they do not fully

understand the changes which are occurring and the precise effects these are likely to have on them as individuals. Equally, however, various sectors of the industry believe that their self-interests may be prejudiced by the deregulatory process. The Chairman of the Bundaberg Canegrowers outlined the position of many of his members in this way:

> "We see no advantages in de-regulation for us. The sugar industry in Australia certainly was the best organised agricultural industry in the world in terms of how it ran and pulled together. Even though we fought with the millers we were damned well organised and even when we had a row we had a central board which settled the row. The structure was there to solve the problems as it went along, internally without government sticking their nose in" (personal communication).

Many individual farmers see the deregulatory process as adding a further element of uncertainty to an industry which is already operates in a context which is highly unstable and unpredictable. On the one hand the implications of the deregulatory process itself are not well understood and this, in itself, adds to the uncertainty. Beyond this however, most people involved in the industry do appreciate that deregulation will almost inevitably result in some form of restructuring of the industry and that there are likely to be both winners and losers within the restructuring process. Many smaller milling concerns and co-operatives see themselves as becoming increasingly uncompetitive and vulnerable to take overs. The farming sector tends to be concerned that it will be exploited by the mills.

> "The millers will just offer us a price for our cane. We won't know what's a good price for the cane, we wont know what their margins are. We will have to deal with them at a local level. We cannot send our cane anywhere else because you are stuck with the mill you have got. And even though they say to us, they say 'why are you worried? We need you - we can't operate without you fellows', they can keep us on the breadline, we are not going to go away as long as they give us just enough to stop us planting mangoes. If they are doing well it doesn't mean we are going to do well. .... You know that Tate and Lyle have been able to take over 2 North Queensland mills, and they have been expanding their refineries here and no doubt they would expand those further if they got the other 7 mills. CSR are the predominant sugar millers in refined sugar, and Mackay sugar who are now mixed up with E D & F Man, so we are going to have 3 big milling interests controlling the Queensland sugar industry. They will co-operate on the basis of how they handle cane farmers but fight viciously over the markets. Its happening already they are fighting like mad over domestic refined sugar" (personal communication, Bundaberg cane farmer).

What does seem to be clear enough is that deregulation will promote a restructuring of the industry. An important point here is that various assets

and property rights within the industry will almost inevitably be devalued as this restructuring takes place. One major concern to farmers is that deregulation will remove the premium value attached to assigned land. To some extent, it may also serve to devalue the assets of the milling sector as they lose their statutory monopoly over the processing of locally produced cane. In both these cases, however, the potential effects are likely to be constrained by geographical factors.

The fact that there will almost inevitably be winners and losers in this process provides an interesting commentary on sustainable development. Whilst this process may allow the industry as a whole to remain sustainable, it will in all probability result in various elements of the current industry becoming unsustainable. Thus it raises key questions about just what should be sustained and what is expendable. As one Canegrowers officer in Mackay put it "do you want to keep the industry alive or the people within the industry?" In practice, views on the deregulation of the Australian sugar industry tend to be defined largely by personal circumstances. As one DPI worker observed:

> "What you find when people go bust is that there is someone walking in behind them to take their place. And in so much as that's rationalisation that's probably seen as a good thing by a lot of people .... in this particular area you will find that those who are in a position to expand are all for deregulation and some of the members of the Canegrowers executive are the people who are in a position to benefit from it the most" (personal communication).

8.6 **Coping strategies: the struggle for sustainability**

The Australian sugar industry is widely held to be productive, efficient and sustainable. In some respects this is a valid commentary. Production is currently being expanded and yields bear comparison with those achieved anywhere else in the world. The industry is efficient in that it remains more or less profitable without the direct subsidies which most other sugar industries receive. In some senses, it also appears to be sustainable. Certainly it is not in the same state of crisis as the Barbadian sugar industry. That said, if Australian sugar industry is in fact sustainable, this sustainability clearly embodies a process of contradiction and struggle within which various problems and crises continue to emerge. In this sense the industry has remained sustainable because, thus far, it has managed to address emergent contradictions more or less adequately. However, two things are apparent within this process. First, many measures which have been effective in

addressing particular contradictions have themselves engendered new forms of dysfunction. And second, the process of remaining sustainable has involved restructuring within which various components of the industry have become increasingly dysfunctional and unsustainable. The struggles experienced within the farming sector over the last ten or fifteen years exemplify this interpretation (Vanclay *et al.*, 1992). Many cane farmers in both the case study locations and indeed throughout Australia have found the sustainability of their own enterprises increasingly prejudiced by a range of developments. Thus far some farms have proved to be sustainable, others have not.

One of the most common responses to 'difficult events' amongst Central Queensland farmers during recent years has been 'do nothing" (Gray *et al.*, 1993:48). In some respects, this has been an effective strategy. At least, inaction did not accentuate the problems faced by increasing debt burdens. However, it is clear that in the longer term, farmers who do not respond positively to changing conditions will not remain viable (Lawrence, 1987). Not least because the minimum viable size of a cane farm is continuously increasing. Of those farmers who did respond positively to the problems they encountered in recent years, three basic strategies predominated: diversification, intensification and the development of off farm incomes.

One of the major differences in the coping strategies adopted by cane farmers in the two areas studied is that whilst diversification was a common strategy amongst farmers in Bundaberg it was virtually non-existent in Mackay. To some extent it may be that geographical factors played a role in creating this difference: Bundaberg is closer to the major urban markets, but it seems unlikely that this can offer a full explanation. One Mackay cane farmer outlined his own position in these terms:

> "They kept saying get a little bit bigger or get out - now they didn't just say that to the sugar industry, they said that to dairy industry as well, encouraged the little dairy farmer to expand. In the years that it worked they thought it was OK. But then when it didn't work they started to say diversify. They brought in this word diversify. Don't keep all your eggs in one basket. Try and get some more farm income by getting something else going. Some farmers tried that and they went by the wayside as well. They tried aloevera, they tried all sorts of things. I didn't try that at all, we are 60 kilometres from Mackay and its hard, when the economy was bad there weren't a lot of jobs or money around anyway" (personal communication).

Although most Bundaberg cane farmers seem to have been reluctant to move away from traditional monocultural practices, as significant amounts of land

were nevertheless taken out of sugar cane during the 1980s. The harvested area fell from almost 40,000 hectares in 1982 to just over 35,000 hectares in 1992 (Canegrowers local records, Bundaberg). A small proportion of this loss, particularly around the city, went into housing developments, but most occurred as farmers diversified into 'small crops' - most commonly, tomatoes, zucchini and peppers. A small number of local cane producers diversified very successfully into small crops in the early 1980s. When incomes from sugar fell later in the decade, a large number of other cane farmers sought to follow this example. However, a glut of production resulted in falling prices for these crops and many new producers found small crops even less profitable than sugar cane. Towards the end of the decade quite large amounts of land around Bundaberg had been transferred to the production of macadamia nuts on properties acquired by urban based financial institutions.

Over the years, several factors have underpinned a progressive intensification of sugar cane agriculture in Queensland. The overall philosophy of the industry, and successive Australian governments, has always been basically productionist. The industry has also always prided itself on, and made a considerable virtue of, its technological efficiency. Over and above these factors the nature of the assignment system has always been likely to promote intensification. On the one hand the regulatory system predicates against intensification in that farm peaks impose a quota on production. But given the situation which has often prevailed in practice where over peak - or number two pool sugar - has often received a price as high or even higher than that for number one pool sugar, there is every incentive for farmers to exceed farm peaks. This is a particularly rational strategy given that the majority of production costs are essentially fixed. However, farm output could not be increased by expanding the area of sugar cane, unless more assigned land was purchased. Accordingly, the assignment system often meant that intensification was one of the very few options open to cane farmers wishing to increase their incomes.

Historically pluriactivity was not common amongst Queensland sugar cane farmers. The single exception to this being a significant number of farmers have developed agricultural contracting businesses within the sugar industry. To some extent this situation may simply reflect the very limited range of economic opportunities which exist in rural Queensland. Equally, however, there appears to be a quite considerable social stigma involved in admitting to needing a secondary income source. By 1992, however, the situation had

changed somewhat and around 75% of Central Queensland cane farms had some source of off farm income, although of those with an income only about 50% amounted to more than A$20,000 per year. The median off farm income amounted A$24,000, some A$6,000 more than the mean farm income deficit at this time (Gray *et al.*, 1993:42).

By the late 1980s a significant proportion of Queensland cane farming families had become heavily dependent on some form of social security provision. The principal support mechanisms which did exist were administered under the Rural Adjustment Scheme. Jointly funded by the Commonwealth and State governments, this scheme is designed to "assist eligible farmers to improve the productivity, sustainability and profitability of their farming enterprise" (DPI, 1993). Eligible farmers may receive a range of grants to facilitate farm improvement programmes. And under some circumstances such as "a prolonged severe drought or substantial commodity price falls", several support measures, including a 'household support scheme', were available. The scheme also provided 're-establishment' grants for farmers whose properties were no longer considered viable. All of these support measures were means tested and subject a range of other quite severe eligibility criteria, and in practice offered only very limited help to most struggling cane farmers.

Many farm households experienced considerable financial difficulty during the 1980s. And during the early part of the decade, most of the families involved found themselves unable to claim any unemployment or state welfare benefits. Following considerably lobbying, the situation was changed somewhat towards the end of the decade when eligibility criteria were changed to allow farmers' spouses to collect unemployment benefit. Such welfare support was certainly significant in allowing a substantial number of farming families to remain on their farms.

> "I first started this job 4 years ago - in 1990. That was just in time for a drought and a further decline in commodity prices. The sugar industry at that time probably wasn't in an all time high - a lot of growers went onto social security. There were hundreds of growers who went onto social security around Mackay and particularly in the valley and around Plane Creek and to a lesser extent up at Proserpine" (personal communication, BSES extension worker, Mackay).

However whilst various forms of welfare provision have become increasing significant to the farming sector, qualification criteria have been rigorous and levels of support have been relatively low. In practice, the Australian

Commonwealth and State governments have provided only very limited levels of support for farmers who experienced financial difficulties.

> "The main part of the RAS is interest subsidy for growers who need help and can show that they are likely to be profitable in the long run. They can get up to half their interest on their commercial debt paid for them. Maybe 20% are eligible for this. Then there are those with very low equity who are unlikely to survive in the long run and those with no debt. The alternative is social security provided by the Commonwealth government and job search funds for the unemployed. If farmers, and particularly their wives are looking for off-farm income to help them survive and they cannot get work, they can register for job search and they can get money like anyone else. But they have to meet the income test and the assets test. Often farmers have too many assets and this eliminates them. Small farms and with some debt can sometimes qualify because the test looks at their net worth. Then there is another scheme called farm household support. The idea of that is for farmers who are struggling and thinking of going out of farming can apply for that. Its provided as a loan for up to two years. It is designed to encourage people to sell sooner rather than later. From the nation's point of view, if the farm is sold to someone with a bit more cash then often the farm is going to be more productive" (personal communication, DPI Farm Financial Advisor).

Opinion amongst DPI workers who administer the RAS and other such schemes that government policy is to run down support of this type is in the future.

> "My personal opinion, is that over the years fewer and fewer people will qualify for RAS. What meagre assistance there is available will disappear .... the emphasis is on productivity and helping farmers who are trying to increase their productivity and who should be viable in the future. The government wants to avoid people who may not be able to survive in farming staying around too long" (personal communication, DPI extension worker).

Mutual support amongst family and ethnic groups

In practice, direct government support for farmers experiencing difficulties within the sugar sector has been very limited. A more important factor has been the mutual support provided within farming communities, particularly within the various ethnic groups which exist in some areas. Ethnic minority groups form a significant component of the farming communities in both of the case study locations. There is a sizeable Italian population in the Bundaberg area, and a significant number of cane farmers around Mackay who are of Maltese descent. Most of these farmers are now second generation

Australians. Members of these minority groups appear to have a high degree of commitment to their farms:

> "My dad wanted me to take it on, he certainly didn't want this farm to go to anyone else .... my dad was like that, he was proud of this place, as a European. I don't know whether it was because it was the first piece of land he had ever owned himself ... my father as an immigrant came from Malta on an unpaid fare and came to Australia and just started working here ..... most people around here, like myself are born and bred on the same properties and nobody wants to give them up .... if they do eventually give them up its because of a banking reason or something like that. They might not show it but they shed a tear when they have to walk off .... if you have been born and bred on a place and then because of some reason you have to leave it, its only because you have been forced off' (personal communication, Mackay cane farmer).

Mutual support, usually within extended family groups, is a common feature of farming practice in these areas. Such support takes several forms including assistance with work on the farm and financial support through informal loans etc. According to one industry profession, whilst the attitudes to farming commonly adopted by some groups within the sugar industry are highly significant, there are signs that these are changing:

> "They had family labour, unpaid family labour. While the traditional anglo-saxon cane farming family were using employed labour the Maltese community often used the extended family. One family in particular comes to mind, they were buying farms during the '80s. They bought, they did very well. More outgoings become discretionary, there's more flexibility. But having said that I think that even within the Maltese community they are becoming more anglo-saxonised in their attitudes and ideals and for at least some of the next generation those principles might not hold" (personal communication, DPI extension worker).

8.7 **Summary**

The Australian sugar industry has not experienced the same sort of crisis which has occurred in Barbados. Indeed, overall production is currently as high as it as ever been. Within this, however, various elements of the industry have proved to be unsustainable. Numerous individual farming enterprises, for example, have gone out of business over the years. Moreover, it would seem fair to say that the sustainability of industry as a whole is far more precarious than many of those involved would care to recognise. The Australian sugar industry has long been predicated on its ability to remain at the forefront of technological development and it is, at best, unclear how long technical innovation can continue to produce progressive efficiency gains.

Equally, changes in the structure of the industry may well prove to be problematic. The demise of the family farm, for example, may well undermine those very qualities of the Australian model of sugar production which have made it more sustainable than its Barbadian counterpart.

One thing which is apparent is that the Australian sugar industry cannot be sustained in some steady state form. Various forms of contradiction and dysfunction have emerged within the industry and new problems continue to arise. These have been engendered not just by external pressures, but also by a dynamism which exists within the industry itself. To date, specific sources of contradiction have usually been addressed more or less effectively, but the strategies used have tended, in turn, to produce new problems and new forms of unsustainability. Increasing chemicalisation has led directly to materially unsustainable outcomes such as the pollution of riverine and marine ecosystems. The development of irrigation schemes has similarly led to unsustainable practices such as water mining. Deregulation will similarly address some specific forms of dysfunction, it will for example reduce many of the constraints which milling enterprises have faced in raising capital and it will give individual canegrowers greater flexibility, but again this will in all probability tend to create new forms of unsustainability. Deregulation is likely to involve increasing exploitation of small farmers by the large corporate enterprises within the milling sector - a process which if allowed to progress beyond a certain point will most certainly proved to be unsustainable - not just for the individual farmers concerned but perhaps also for Australian environment and possibly even for the industry as a whole.

Although Australian farmers, like farmers elsewhere, value the perceived autonomy which their profession brings, in reality they have had little room for manoeuvre. A sugar price which, in real terms, has been declining for decades, the institutional structures and the culture of the sugar industry have all combined to create a situation within which the range of possible development strategies have been severely limited. Indeed, in very many cases farmers have had to adopt survival strategies rather than development strategies. In practice, it has been all too easy for farmers to become trapped on a treadmill of investment and all to difficult for them to pursue any alternative paths. Attempts to increase efficiency through technological development and increasing farm size have often led directly to high and unsustainable levels of debt. This is a condition within which unsustainable practices are all too likely to occur and thus a condition within which

materially and morally unsustainable outcomes will tend to be the norm. As Vanclay *et al.* suggest:

> ".... increasingly subordinated by finance capital, producers will have little room to alter production regimes .... it is likely that there will be increasing pressures on the environment. Ecological problems will invariably increase with any intensification of existing practices" (Vanclay *et al.*, 1992:5).

Within all of this, it seems that the Australian sugar industry as a whole may well prove to be sustainable for some time. It will be restructured, and will remain capable of producing sugar. A key question here is whether this constitutes sustainable development. Given that the very process of sustaining the industry seems to involve a whole range of materially and morally unsustainable outcomes this must be questionable. Certainly for many Queensland cane farmers the development of the Australian sugar industry has proved to be anything but sustainable.

Chapter 9 **AUSTRALIA ANALYSIS**

This chapter provides a deeper analysis of recent events in the Australian sugar industry in order to better explain both the potential for unsustainability of the industry itself and the range of environmentally, socially and morally unsustainable outcomes which have been associated with the development of this sector. The discussion focuses on the contradictions and tendencies to dysfunction which have emerged within this sector and the strategies through which these have been addressed. Particular attention is paid to the ways in which the regulatory system has affected the development of the industry. Particular consideration is given to the relationship between the inherent unsustainability of the traditional socio-economic formation within the sugar sector and various materially and morally unsustainable outcomes which have occurred. The final sections of the chapter aim to provide an explicitly realist interpretation of these outcomes.

9.1 **A model sugar industry, a model of sustainability?**

The Australian sugar industry is widely held to be a model of efficiency and, tacitly at least, of sustainability (DPI, 1994). Certainly the Australian industry does not appear to be experiencing problems so profound or so immediate as those which have affected some sugar producers such as in Barbados. However, even a superficial examination of the situation in contemporary Australia soon reveals that the sustainability of the sugar industry is increasingly tenuous and uncertain. Moreover, it is also apparent that the sustainability of the sugar industry itself has been dependent on mechanisms which have tended to produce a range of materially and morally unsustainable outcomes both within the sugar sector and outside it.

There are some aspects of commonality between the Australian and Barbadian sugar industries: both produce an identical product - cane sugar; both use more or less monocultural agricultural systems allied to centralised mills; and cane production units are, for the most part, of a very similar size in both of these locations. Beyond these factors, however, significant differences exist between the two industries. Australia is a developed country with a high wage economy. Although a proportion of total production is consumed domestically and some is exported under short term bi-lateral agreements, the Australian sugar industry remains highly exposed to the world sugar market. And unlike the majority of other cane sugar industries throughout the world the Australian sugar sector receives little if any direct government support. A further profound difference between Barbados and Australia lies in the extent

to which the Australian industry has been regulated. Almost every facet of the Australian sugar sector has been tightly controlled for over fifty years. Another basic distinction lies in the fact that the plantation system around which sugar production first developed in Australia collapsed at the end of the nineteenth century. The plantations were replaced by family farms which remain the basis of the industry today. And, again in sharp contrast to the situation in Barbados, the typical family farm in Queensland employs no non-family labour, although extensive use is made of contractors. Perhaps the most striking feature of the Australian sugar sector, however, is the almost obsessive and largely unquestioning faith in technological innovation and modernisation which pervades the industry. Already highly mechanised and fundamentally reliant on chemical inputs, the future of the industry is seen as being very much dependent on further technological development and the continued adoption of new production technologies. The general perception is that the Australian industry needs to remain viable within the global sugar economy, and that its one comparative advantage lies in its ability to remain technologically ahead of the field (SCIST, 1989).

9.2 **Coping with emergent dysfunction**

Throughout its history the Australian sugar industry has needed to address a series of tensions and contradictions which have periodically threatened dysfunctionality and unsustainability. These contradictions have been confronted in various ways. They have been postponed through the more or less constant adoption of new technology; they have been absorbed through the self-exploitation of small farmers; and they have been held in check through the development and operation of a comprehensive system of regulation. But in each of these cases, the resolution of specific problems has tended in turn to produce new contradictions and new sources of potential dysfunction. Sustainability for the Australian sugar industry has been and remains a constant struggle to stay ahead of the game. Certainly this is how the situation is widely perceived within the industry. Specific problems are addressed, more or less objectively, as they arise, but whilst the measures which come into place may be effective in counteracting specific elements of dysfunction, new contradictions continue to emerge. From this perspective, the Australian sugar industry is trapped in a process which in the final analysis cannot be sustainable - a road which gets steeper and steeper and ever more intractable the further one goes along it. And moreover, not only is

the process itself always likely to become untenable, it is by its nature a process which will always tend to produce a range of unsustainable outcomes as the contradictions which continue to emerge become ever more acute and adequate responses necessarily become ever more exploitative.

The Australian sugar industry has for some time been acutely aware of its vulnerability and potential unsustainability. Within the industry itself the greatest threat is seen to lie in its high degree of exposure to the depressed and volatile prices of the global sugar economy, and the fact that Australia has to compete internationally with a host of foreign sugar industries where wage costs are often much lower and which are often heavily subsidised. A particular problem for the Australian industry is that while most of its competitors still have low wage economies and still benefit form direct subsidies, many are nevertheless becoming increasingly sophisticated in their farming systems. Thailand, which competes directly with Australia in the regional market, is a case in point here. The Thai sugar industry has expanded rapidly in recent decades often using technology developed and produced in Australia (ABARE, 1991a).

In practice, the financial viability and thus the sustainability of the Australian industry is doubly threatened by the nature of the global sugar economy. On the one hand, the low prices at which sugar is traded internationally clearly prejudice profitability. But beyond this the volatility of the market, typified by short booms and then long periods of very low prices is also problematic. The structure of the Australian sugar industry, which involves a large number of what are in effect small farms and a milling sector composed of relatively small companies and co-operatives, is well suited to withstanding short periods of low returns, but as recent events have demonstrated, few of the enterprises involved have the resources to withstand long periods of severely depressed prices. In practice, many Australian cane farmers have gone out of business in recent years.

Most of the individual farming enterprises which have failed within the sugar sector have done so because they have acquired unsustainable levels of debt. In itself, debt is not necessarily unsustainable. Where money is borrowed to finance investment which will lead to future productivity gains and enhanced profitability, debt can be seen as positive. Certainly such debt oils the wheels of capitalism throughout the world - credit defers one form of unsustainability. Conversely, however, where debts are accrued because of the operational

unprofitability of an enterprise, they are clearly unsustainable in anything other than the very short term. Recent events in the Australian sugar industry blur this distinction. On the one hand, most if not all sugar cane farmers have been adversely affected by the particularly long period of severely depressed sugar prices which began in the early 1980s and extended into the 1990s. Even well run farms have been hard pressed to make any kind of operational profits during this period. That said, however, there is considerable agreement within the industry that those most severely affected, those who have actually become economically unsustainable, are for the most part those who had borrowed most to invest in new machinery and, allied to this, to increase the size of their holdings. This is in itself somewhat ironic given the philosophy of modernisation which pervades the industry. Certainly, many cane farmers are now very bitter that they were positively and aggressively encouraged to borrow heavily by both the government and the banks during the early 1980s. 'Get big or get out' was very much the industry watchword of the early 1980s, not least because this philosophy was actively promoted by government, quasi-governmental agencies and the financial establishment. Within this, the banks involved in the sugar sector were prepared to extend, and indeed did extend, unrealistically high levels of credit to large numbers of cane farmers. Subsequent events have clearly indicated that the prudence of this agenda was, at best questionable. Many individual cane farmers found what would in any event have been a difficult situation grossly exacerbated by inappropriate development strategies and investment decisions. In practice, these development strategies were effectively defined by the establishment and fundamentally enabled by the financial sector. For a great many small sugar cane farmers the modernisation roller coaster has gone off the rails. However, thus far at least, the industry as a whole has been sustained. Moreover, while many individual farmers may have found the modernisation, techno-fix culture to be unsustainable, various chemical companies, machinery manufacturers and down-stream sectors of the industry have clearly benefited from this agenda (Vanclay *et al.* 1992).

To date, the Australian sugar industry has been able to maintain some comparative advantage by remaining at the forefront of innovation in sugar production. Yields have increased, unit production costs have fallen and the increasing adoption of irrigation has reduced some elements of risk and uncertainty. In the end, however, the modernisation process is inherently unsustainable, at least it cannot be sustained indefinitely. Involved in a competitive global economy the Australian sugar industry has faced and will

continue to face constant pressures to improve its efficiency, productivity and cost effectiveness - not so much to improve its profitability *per se* but rather simply to remain economically viable. Thus far the industry has managed, just, to remain internationally competitive. It could be argued that this constant pressure has produced a highly efficient industry. And in some respects this is so - yields are as high as anywhere else in the world and production costs are low. But this type of efficiency hardly equates to sustainable development. Subordination to a technologically driven process of development is always likely to involve a range of unsustainable outcomes. The impacts of the modernisation and intensification of Australian agriculture in general are well documented. See, for example, Watson (1986); Margules (1989); Naydler (1989); Boyden *et al.* (1990); Campbell (1989); Lawrence and Vanclay (1992). The key environmental impacts associated with the sugar industry include: water mining and salinisation problems associated with irrigation practices (Watson, 1986; Hungerford,1987; Williamson, 1990; BSES, 1992); soil erosion and (ABARE, 1991b); nutrient leaching (ABARE, 1991b); eutrophication and it seems damage to the Great Barrier Reef (CSIRO, 1990).

A more profound problem lies in the distinct possibility that the modernisation process itself may be fundamentally unsustainable. It requires constant technological innovation, and whilst the mechanisms through which this is achieved are largely institutionalised in Australia, for example through the BSES and the DPI, it is at best an act of faith as to just how long incremental efficiency gains can be made. This must be so because there are absolute limits on just how productive agricultural land can be. Given the relative sophistication of the methods now employed by Australian industry it is highly likely that these limits are already being approached. It is certainly the case that whatever the absolute limits to productivity might be, a process of diminishing returns becomes increasingly significant the nearer these limits are approached. This may appear to be a somewhat trivial point in that it would be possible to expand the area under cultivation as productivity limits were approached on particular farms. And in practice, this seems to be what has occurred as individual sugar farms have tended to increase in size. However, it is not clear whether this is a valid refutation of the argument, either for the sugar industry being considered here, or in the general case. Within the sugar sector at least, geography plays an important role because the extensification of many sugar producing areas is constrained by the lack of suitable land or water supplies; and because of the need for cane land to be close to a mill restricts expansion of particular mill catchments. In the more

general case, there are other contradictions. For example, production is always going to be limited by levels of consumption if by nothing else.

The fact that the modernisation process predicates progressive increases in farm size may also promote new contradictions and new tendencies to unsustainability. The system of family based sugar cane farms in Australia emerged out of the unsustainability of the plantation system which preceded it. Once established, the family cane farm has, in many respects, proved to be a particularly effectual basis for the industry. Perhaps the most useful quality of the family sugar cane farm has been its potential to absorb contradictory and dysfunctional developments. In large part, this potential stems from the degree of self-exploitation which individual farmers are willing, and in practice have often found themselves obliged, to endure. Over and above this factor, however, a whole range of other informal support mechanisms based around the family farm have also served to maintain the sustainability of individual enterprises and, in a cumulative manner, of the industry as a whole. However, if the size of what constitutes a viable farm increases beyond a certain point, it becomes impossible for a single family to operate the farm whatever technology and mechanisation are employed. In this sense, the 'development' of the Australian sugar industry has been creating not only environmental and agronomic barriers to its own reproduction, but also social barriers. Mechanisms which disenfranchise small farmers not only produce morally unsustainable outcomes, they also constitute a transformation to a new structure of production which in many respects may be inherently less sustainable than that which preceded it. Modernisation has benefited some sectors of the industry largely at the expense of individual cane farmers, but should the family cane farm prove to be unsustainable, the restructuring this would entail may well create new and profound barriers to sustainability. Barriers which will affect the industry as a whole.

This dialectic provides a particularly telling commentary on neo-liberal approaches to sustainable development. The demise of the family farm and its replacement by larger production units arguably represents a transition to new structures which by virtue of the fact that they have replaced the old are supposedly more efficient. Thus, in one sense, this constitutes 'development' - the industry is more productive, more efficient and overall welfare is increased. But this interpretation may be flawed. Not least because the transition is not simply the product of the market. In practice, the nature of development has been determined, in part at least, by the nature of the

regulatory system and within this by the character of particular institutions such as the BSES. Beyond this, however, the strategies adopted by powerful groups up and downstream of the agricultural sector also appear to have been extremely significant. Chemical companies, machinery manufacturers, sugar millers and refiners and particularly the banks have all influenced the actuality of sugar cane agriculture. A key point may be that the strategies adopted by these groups appear to have involved more than attempts to promote profit maximisation *per se*.

This situation is inherently contradictory. On the one hand the viability of the family farm has been increasingly prejudiced by 'development' within the Australian sugar sector. However, while the general mode of development existing in Australia has tended to undermine the viability of the family farm, there have also been a whole range of mechanisms put in place to support the individual cane farmer. In practice, the whole regulatory framework has protected the interests of the farming sector. Certainly this was the rationale behind its original development. Within this, a variety of governmental and quasi-governmental institutions such as the DPI and the BSES have performed specific support functions. However, it is clear enough that the remit and the agendas of these institutions has extended beyond any singular for the family farm itself. In practice, it may be that these institutions have become so embedded within a particular interpretation of what development is, and what this means in Queensland, that they no longer really serve the interests of the small sugar cane producer. Both of these institutions are for the most part staffed by plant biologists, geneticists, soil scientists and hydrological engineers.

An interesting question arises here as to whether the modernisation ethos which has fundamentally influenced the nature of sugar cane agriculture in Australia is the only practical development option. Certainly it is possible to envisage other possibilities such as, for example, a low input - low output system within which yields would be reduced but so would costs. As such a system would reduce overheads and operational costs it might well have some advantages for farmers operating in a situation where incomes are uncertain. Similarly, there would appear to be some advantages in more poly-cultural production systems. These would be positive in terms of maintaining soil quality and fertility and in preventing the build up of pests and diseases which are a particular problem in sugar cane agriculture. It may be that such alternatives would not be any more viable than those currently favoured.

Perhaps the key point, however, is that for most farmers these have never really been considered as options. In practice, the context in which Australian cane farmers have operated has embodied a range of constraints and enablements which have served to promote particular types of development.

The low sugar prices of the 1980s and the cash flow problems which ensued have accentuated and effectively brought to a head what was in any case a progressively unsustainable situation for the family farm in the Australian sugar industry. However, while the problems which many farmers faced were frequently profound and immediate, they could only respond to their situations within the context of the actual and perceived opportunities and constraints which existed. In practice, the responses which farmers actually adopted were clearly influenced by the nature of the institutional and cultural context in which they operated. On the one hand, farmers perceptions of what opportunities existed were largely conditioned by the institutionally promoted modernisation ethos. But, even within this context, it is clear that the degree of freedom available to individual farmers has been very limited. Many farmers have been fundamentally dependent on, and constrained by, the financial sector. Moreover, the agricultural sector as a whole has become increasingly subordinated to up-stream and down-stream sectors of the industry. Individual farmers have been influenced by both a culture which centralises a particular type of development and by the progressive impotence of their position.

In practice, the crisis situation of the 1980s produced three basic responses from cane farmers: apathy; diversification and further intensification. Apathy, or at least a considerable degree of circumspection, often appears to have been the most effective strategy here - at least those farmers who did nothing didn't make their situation worse than it already was. That said, it is fundamentally clear to all concerned that inaction is not going to make cane farms sustainable in the longer term.

Diversification has been relatively common in some areas, such as around Bundaberg, but virtually non existent throughout most of the industry. In the Bundaberg area, quite significant numbers of individual farmers did move into 'small crops' - tomatoes, zucchinis, etc. - during the 1980s. In practice, this strategy appears to have been ineffectual and indeed counter-productive for many of the farmers concerned. It seems that diversification most usually occurred as a panic response to low returns and pressing cash flow problems.

For the most part, diversification was poorly planned, poorly capitalised and tended to make a bad situation worse for the individual farmers concerned. In some regions, including Mackay, small but nevertheless significant amounts of cane land has been taken out of sugar production altogether as sub-profitable farms have been bought by urban based financial concerns and transferred completely into low maintenance crops such as macadamia nuts. This seems to have occurred where problems within the sugar industry have served to make land available at low prices.

In practice, further intensification was the most widespread and common active response to the cost price squeeze which developed during the early 1980s. The decision to further intensify already intensive production systems appears to have been influenced by a range of factors. The difficulties of the 1980s were preceded by a short period of particularly high returns and this may have influence many farmers, but perhaps more significant was the way in which most farmers seem to have been profoundly constrained in their thinking by the ethos of modernisation which pervades the industry.

The appropriateness of intensification strategies, now at least, appears to be questionable. They are associated with a range of environmental and agronomic problems. And, as events have shown, this sort of strategy has resulted in many farmers accentuating rather than ameliorating their financial problems. It is then curious that faith in modernisation hardly seems to have diminished amongst those farmers who remain in the sugar industry. 'Farm development strategies' and 'property management plans' (terms widely used by various extension agencies in Queensland, see for example, DPI, 1994) have been largely determined by the almost universal perception that progressive efficiency gains are fundamentally necessary. Farmers often suggest that difficulties arise when enterprises try to expand or modernise too quickly and thus get into debt, but they hardly question the appropriateness of the modernisation process itself.

In practice, the same pressures and opportunities which have driven farmers to seek higher and higher yields and ever more 'efficient' and 'profitable' production methods have involved not only the purchase of expensive hardware, they also created new pressures to enlarge holdings. Both of these have tended to involve high levels of debt. The tendency to farm enlargement would appear to threaten the future of the family cane farm in several ways. First, the high levels of debt implicit in farm modernisation and enlargement

may not be sustainable. Certainly, overly ambitious expansion has been a major factor in the failure of many sugar cane farming enterprises in recent years. Second, the very process of enlargement means that farm units are tending to become too large to be run by a single family with no additional labour.

Several factors have encouraged farm enlargement, not the least of which is a widespread set of problems associated with the inter-generational transfer of sugar cane holdings. Cane farms which will just about support one family will not support two or three families, and many farmers with one or more children have acquired new holdings in order to provide work and income for these children when they reach maturity - something which normally occurs long before the older generation is prepared to retire. It has been extremely common for individuals who have tried to expand in this way to become over extended and to find themselves in a position where they have been unable to service their debts. Given this situation, it is quite ironic that the family farm also appears to be threatened by the fact that many members of the younger generation exhibit a marked disinclination to enter farming. This may simply reflect a relatively long period of low incomes, but equally it may have much to do with higher levels of educational attainment and the emergence of wider employment opportunities both in the local areas and further afield. There also seems to be some evidence that the approach to farming which has evolved in Queensland with its emphasis on modernisation and the bottom line of profitability has itself served to undermine the basis of family farming. Attention is increasingly centred on economic criteria, not simply because of the widespread financial difficulties experienced during the 1980s, but also because this has become part of the prevailing culture of the sugar industry. Indirectly this may contribute to the unsustainability of the family farm as ideas such as stewardship, attachment to the land and inter-generational commitment to a particular farm are tending to become secondary aspects of farming businesses. Moreover, farm enlargement is a process which will almost certainly be further accentuated by the deregulation of the sugar sector. It is also apparent that the tendency to a smaller number of larger units is a self-reinforcing process in that the larger units are normally best placed to expand further, not least because they have more equity which allows them to finance such expansion.

It also seems that the family farm is in danger of becoming an increasingly marginalised and impotent segment of the sugar industry because of its

progressive subordination to upstream and downstream interests. A process of subordination to upstream interests is well established. The agricultural sector is already fundamentally dependent on chemical inputs and high technology hardware (Vanclay *et al.*, 1992). And, perhaps crucially, it is also heavily dependent on the banking sector (Bryant, 1991:81). Now it seems that their relationship with upstream interests is going to become increasingly unequal. Deregulation will, most certainly, change the nature of sugar milling and marketing in Australia. The balance of power, always likely to favour millers rather than small farmers, will almost inevitably tip further away from the farming sector. Not only will some regulatory checks cease to operate, but the milling sector itself is likely to be quite dramatically transformed. TNCs such as Tate and Lyle are becoming major players in the Australian industry. Tate and Lyle currently have an aggressive expansion policy and are attempting take-overs of a number of small milling concerns throughout Queensland. Similarly, various established milling enterprises, both private companies and co-operatives are also seeking to expand through mergers and acquisitions. These processes will, almost inevitably, result in a concentration of ownership which will tend to further marginalise the agricultural sector in general and the family farm in particular.

9.3 **Regulation as a cause of unsustainability?**

The restructuring of the sugar industry into a system based on large numbers of small family farms allied to relatively small local milling enterprises around the turn of the century may have negated earlier forms of contradiction and dysfunction, but in achieving this it created the potential for new forms of contradiction and crisis. For over fifty years this potential for dysfunction has been addressed through a purposively constructed regulatory system which controlled almost every aspect of sugar production. However, the regulatory system itself has now come to be seen by government, if not by all those involved in the industry, as a source of dysfunction and unsustainability.

The nature of sugar cane production and milling is such that, unless the entire operation is undertaken by a single body, various regulatory functions need to be addressed. Given the duality inherent in the agro-industrial nature of sugar production, tensions are always likely to emerge regarding the distribution of income throughout the industry. Over and above this, however, the nature of the sugar industry is such that a crucial significance attaches to

the effective co-ordination of many of the separate operational processes involved. Co-ordination which, it might well be argued, is most easily and most satisfactorily imposed by some external regulatory authority. Harvesting and accordingly planting need to be carefully planned and timed so as to ensure an even input to the milling sector throughout the harvest season. Discontinuous supply results in the expensive under-utilisation of mills, and oversupply creates delays which can very quickly result in dramatic falls in the sugar content of the cut cane and hence severe reductions in income for both farmers and millers. Allied to this, the area planted in sugar cane needs to correspond to the capacity of the mill. Given the four or five year cycle of planting and ratooning, the process of ensuring correspondence clearly involves a considerable degree of forward planning. In so much as the arrangements necessary to ensure cohesion here can serve to advantage some sectors of the industry at the expense of others, effective regulation also necessarily entails a large degree of impartiality. The point here is not simply that inequitable patterns are morally undesirable, but also that beyond a certain point inequity is always going to be likely to produce dissatisfaction and ultimately dysfunction. Given this time scale and the need for more or less equitable solutions, it is far from clear whether a laissez-faire system, such as that currently being promoted, will achieve the kind of coherence, legitimation and compliance needed for the industry to function. Certainly it is unclear whether this could be achieved any more effectively than it is by the current regulatory framework.

In practice, few of those actually involved in the Australian sugar industry are unhappy with the current regulatory arrangements. Some dissatisfaction has been apparent with respect to specific controls. For example, with those controls which meant that buyers and sellers could not determine the sale price of designated cane land for themselves, and indeed these elements of regulation were apparently often circumvented by under the table payments. Similarly restrictions on the ways in which co-operative mills can raise investment capital are also seen as being increasingly inappropriate. But these perceived shortcomings relate to specific and relatively minor aspects of the overall regulatory framework. The vast majority of those involved in the Australian sugar industry, and the farmers in particular, believe that the regulatory system as a whole has been for the most part positive and effective. Few understand the rationale for deregulation and many are concerned with the consequences which this process might have for them as individuals within the industry - quite possibly with some considerable justification.

Whilst the continued requirement for some form of regulation is still recognised by almost all those involved, the present day agenda and indeed practice in Australia involves quite radical changes to the regulatory status quo. Liberalisation of the agricultural sector in general has been a central tenet of Commonwealth government policy for some years - and in point of fact the sugar industry is amongst the last sectors of Australian agriculture to face deregulation. Within the sugar industry itself, deregulation is widely seen as being little more than the product of an ideologically inspired political agenda. In particular, it is argued that as the Commonwealth government has been so vociferous in its criticism of sugar industry support in other countries, and of protectionism within the global sugar economy, it has had little choice but to be seen to put its own house in order (Borell and Duncan, 1989). Within this, the government cites a range of arguments to support deregulation. In total these arguments amount to the contention that the regulatory system itself has come to represent a source of unsustainability for the sugar industry. The suggestion being that regulation, by its nature, is restrictive and inhibitive of dynamism, innovation and the promotion of efficiency and competitiveness in the industry. As the Sugar industry Commission put it:

> "It is appropriate that the Australian government engage in negotiations aimed at persuading other governments to dismantle trade barriers, but their can be no guarantee that they will influence outcomes significantly in Australian's favour. One factor which is clearly subject to the influence of governments in Australia is the regulatory controls imposed on the Queensland industry. This is the most significant factor impeding the achievement of higher levels of efficiency" (Sugar industry Commission, 1992:2).

The general argument in favour of liberalisation is not so much that the industry cannot be regulated effectively in the sense that it cannot be managed, rather that regulation of this type is not conducive to 'development' because it tends to inhibit innovation and dynamism. In itself, this is interesting from a sustainability perspective. For example, the basis of this argument implies that an industry such as this cannot be sustained in a steady state, and accordingly that the viability and effectively the sustainability of such an industry depends on its ability to change. If this is indeed the case, the achievement of sustainable development requires that processes of change need to be internalised in ways which do not, by virtue of what they are, promote unsustainable outcomes. This is not necessarily an unrealistic agenda.

9.4 Relational unsustainability? Exigency, expediency and expendability

In the Barbados case it was argued that both the unsustainability of the sugar industry and a range of other unsustainable practices and events stemmed more or less directly from the unsustainability of extant socio-economic formations. Superficially, the situation in Australia appears to be somewhat different. Certainly, there is no plantocracy, no elite land owning class whose economic base and status are threatened. A slightly deeper analysis, however, soon identifies some close parallels. The family farming system, although it hardly constitutes an elite class, is nevertheless part of a particular socio-economic formation, and it seems a formation which is becoming increasingly prejudiced by a range of emergent contradictions. As it is presently formulated, the Australian sugar industry clearly supports significant interests upstream, and increasingly downstream, of the agricultural sector. It may well be that threats to the sustainability of these up and downstream sectors, and the strategies which have emerged in response to these, are crucial to understanding the causality of much that is unsustainable within and around the Australian sugar industry.

What emerged from the Barbados analysis was that an elite group within a particular socio-economic formation became increasingly threatened by the unsustainability of the formation as a whole, and that this particular group was able to maintain its own status, but only through processes which tended to produce a range of unsustainable outcomes. Something which might be termed 'relational unsustainability' was translated in to various forms of 'material unsustainability'. The largely inconsequential was translated into the consequential. In the Australian case, the formation is different, but the processes and mechanisms involved and the outcomes produced bear close comparison. Here, the formation concerned extends beyond the agricultural sector to include functionally integrated sectors both upstream and downstream of farming. To some extent the same could be said about the Barbadian formation, but in this case the integration is more essential and more influential. Indeed in Australia the farming sector has tended to become an increasingly marginalised, dependent and impotent section of the industry. Economic benefits, power and the potential for self determination have ebbed away from the sugar farming sector, and as in Barbados, when the sustainability of the formation as a whole has become threatened those with most to lose, those with the most power, have sought to defer the unsustainability of their own positions through whatever means are possible.

And again as in Barbados, this has resulted in a range of materially and morally unsustainable outcomes in Australia.

Throughout the last hundred years Australian sugar cane agriculture has progressively become more dependent on higher levels of inputs: chemicals, machinery and capital. The dysfunction and unsustainability which is now emerging within the industry clearly threatens the viability of those enterprises involved in supplying these inputs. Enterprises which in any event are always going to face pressures to expand their own production and sales irrespective of developments within other parts of the sugar economy. The development of a high-input:high-output agricultural system has clearly benefited the upstream sectors of the sugar industry. A key point here is that the conditions which promoted this type of development have become largely institutionalised in Australia. Whether this is by accident or design, the agricultural sector has been conditioned to a particular type of farming - a type of farming which is perhaps not the most appropriate or the most sustainable, certainly it is only one of a range of potential options.

Modernisation may have allowed the Australian sugar industry to remain internationally competitive, and within this it may have allowed some individual farmers to remain viable. But the most telling commentary on this process comes from an appreciation of the strategies which have been adopted in response to the increasingly acute contradictions which emerged during the 1980s. Here the whole of the industry, including upstream sectors, became increasingly threatened. And whilst farmers' responses varied, the majority have sought to address their difficulties by further intensifying their cane production. This further intensification of an already heavily chemicalised production system must be dubious from a sustainability perspective. Particularly in a climate such as that in Queensland where water resources are crucial both within agriculture and outside it. In practice, there is evidence that problems such as nutrient leaching, salinisation and water mining are being accentuated. Perhaps the most widespread unsustainable outcome, however, has been social. Large numbers of individual farmers and their families have suffered prolonged and often quite severe hardship. This has resulted not simply from a period of low incomes due to depressed sugar prices. In practice, many individual farmers, commonly using borrowed money, invested in higher and higher levels of inputs. This clearly served to postpone the unsustainability of those who supply these inputs, but it has proved to be a profoundly unsustainable strategy for many of the farmers concerned. In some ways the demise of the family farm presents an interesting

commentary on what sustainable development may involve. In so much as the disappearance of the family farm will, in all probability, involve the formation of new larger production units, development in the Australian sugar industry seems to be going full circle. Development has progressed through one increasingly unsustainable formation - the nineteenth century plantation system, to another based on family farms, only to return to something very much like the original within the space of less than one hundred years. Perhaps this new formation will itself be replaced by a 'new' structure of small family farms sometime around the mid twenty first century. This begins to suggest how the material unsustainability predicated by the capitalist dynamic might be averted in practice.

Whilst the chemical companies and machinery manufacturers have clearly benefited from the modernisation process which has taken place within the Australian sugar industry, the process itself has only been possible because of roles played by various government and quasi-governmental institutions and crucially by the banking sector. Institutions such as the BSES and the DPI were quite unambiguous in promoting modernisation, but most individual farmers were only able to embark on such a programme with the support of their banks. In fact, the role of the banking sector is particularly interesting here. On the one hand it involves an input little different to any other used in sugar cane agriculture, but beyond this it has also played a crucial enabling role with respect to much of what else has occurred.

In retrospect, the position taken by the banking sector is clearly questionable in a number of respects. Certainly it resulted in a great many bad debts and a great deal of suffering for many farming families. And again with hindsight, it would seem that many of the lending criteria adopted by the banks were manifestly inappropriate. Such criteria are normally based on some combination of (a) income generation potential - that is the ability to service debts, and (b) equity - the value of property and other assets to underwrite debts. In Queensland many cane farmers found themselves in a situation where they could not service their debts and where their indebtedness far exceeded the value of their properties. It is interesting here to speculate how a number of long established commercial banks could have, it seems, got things so apparently wrong. It may be that they were simply incompetent; in effect that they had little or no knowledge or understanding of the international sugar economy and that they were unaware that the boom of the 1970s was very likely to turn into bust very quickly. Quite a profound commentary on the banking sector if this was indeed the case. Alternatively it may be that the

banking sector was top heavy with deposits which it had no suitable opportunities to invest in during a recession, and because of this it relaxed its normal lending criteria. Alternatively, it may have been the case that the banks which had interests extending throughout the whole of the sugar sector were prepared to be unduly flexible in their attitude to the farming sector in order to protect their interests elsewhere in the sugar industry.

Whichever of these explanations is most applicable, it appears that the banking sector got its fingers burnt. A very large percentage of loans to small sugar cane farmers have turned bad and in many cases there is little realistic prospect of the situation being turned around. Debts have commonly been rescheduled and often continue to be serviced of a fashion, but in many cases with little real chance of them being repaid in the foreseeable future. It certainly seems unlikely that any moderate increase in the sugar price would be sufficient to turn things around. Thus there exists a situation where the banking sector, by virtue of the liens it holds on delinquent loans, is the *de facto* owner of much of the land involved in the sugar industry (a situation which is remarkably similar to that existing in Barbados). Any resolution of these problems would almost inevitably involve quite radical restructuring entailing both a devalorisation of the assets of cane farmers and the injection of new capital into the industry. In practice, the condition of unsustainable debt which pervades much of the industry can only be ameliorated by a restructuring which would involve a move away from the family farm to a new industry structure, presumably one involving much larger cane production units. In this sense, the conditions of the present would seem to be predicating the nature of future development in the sugar industry. Certainly, a restructuring of the industry which involved those small farmers with unservicable debts being bought out by larger concerns would effectively solve a problem for the banking sector.

The principle rationale for the sugar industry regulatory system lay in the perceived need to address the problems inherent in the unequal relationship which existed between the agricultural and milling sectors. The suggestion being that in an unregulated industry the milling sector would be in a position to extract an inequitable proportion of total profits and this would not just have been socially unjust, but also capable of undermining the viability of the whole industry as cane production became disrupted. The regulatory system which came into being managed to prevent this type of dysfunction occurring in practice. Within this, however, it maintained a milling sector composed of numerous relatively small, locally based, milling companies and co-operatives.

This made it possible for relations between millers and growers to be effectively regulated, but given the central purchasing and marketing arrangements which existed for raw sugar, it did not, in itself, serve to prejudice the viability of the individual milling enterprises concerned. Deregulation of the sugar industry will inevitably change this situation quite profoundly. Under the highly regulated system, mills could not compete with each other and so size was not a major factor. In a deregulated situation, however, whilst individual mills are geographically constrained in the extent to which they can compete for cane suppliers, they are very likely to have to compete for market share when it comes to selling their produce. This may well serve to disadvantage the agricultural sector in several ways. Most obviously mills, now exposed to a competitive environment, will seek to reduce their operational costs - the most significant element of which is the prices they pay their suppliers of sugar cane. Many mills have already begun to embark on this process, for example, by changing to continuous crushing - a development which places an added burden on cane farmers because such a system obliges them to work very extended hours during the harvest season. A competitive sugar economy within Australia is also likely to involve different sugar producing regions and their associated mills competing with each other for market share. Within this, it is clearly possible that some regions will loose out. Particularly so because the current structure of many relatively small milling enterprises is almost inevitably going to be replaced by a structure involving a small number of powerful milling concerns many of which may well be owned by TNCs such as Tate and Lyle.

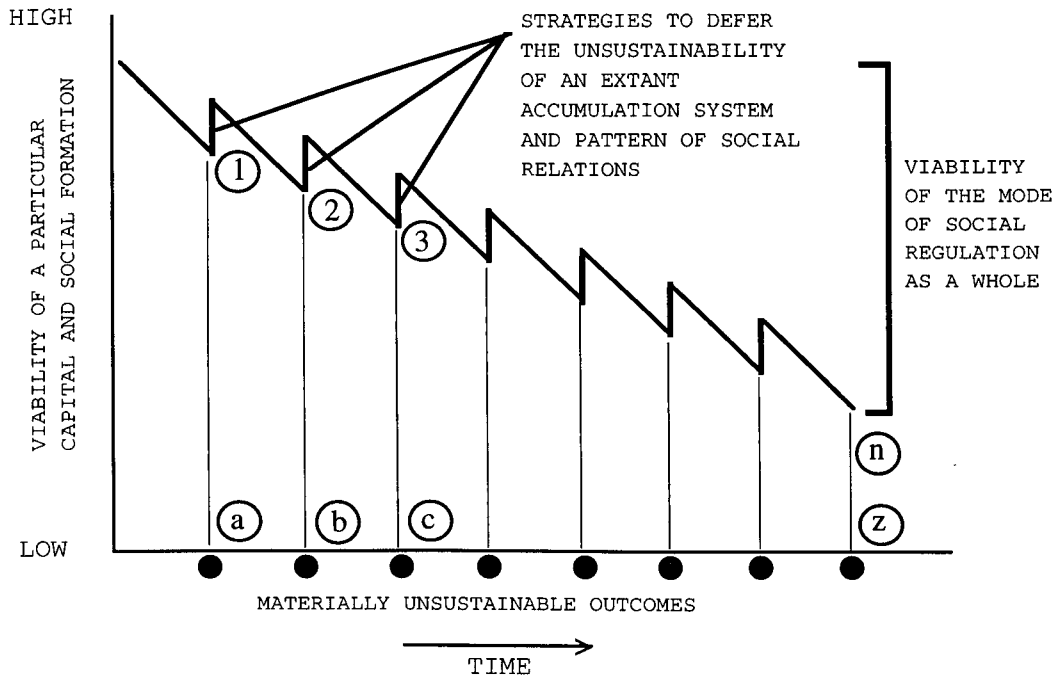
Whilst companies such as Tate and Lyle are averse to becoming directly involved in sugar cane agriculture because of the risks and uncertainties involved, it is also the case that they have no particular interest in sustaining sugar production in any particular region of Australia, or for that matter in Australia at all. Tate and Lyle are primarily interested in sugar refining and marketing - that is where the greatest value adding and profits are to be found. Where the raw sugar comes from is a very secondary consideration in a situation where at a global scale there is considerable structural oversupply. Some well-informed actors within the industry believe that Tate and Lyle's recent investments in Australia's sugar sector may well have much more to do with gaining a foothold in South East Asia which is perceived as the main region of growth in sugar consumption at a global level, than it has with Australia's ability to produce raw sugar efficiently and competitively.

9.5 **Real unsustainability? structures, mechanisms and outcomes**

Development within the Australian sugar sector can be analysed using the conceptual framework used to explain developments in the Barbadian sugar industry. As the Australian sugar industry and the socio-economic formation of which it is constituted has become stressed through the periodic emergence of various contradictions, measures have been enacted in attempts to defer the unsustainability which these have threatened to bring about. Although what has occurred is in some respects best understood as a continuous and singular process, it is still possible to identify particular and perhaps telling moments within its progression.

In figure 9.1, moment #1 might be the failure to reproduce an adequate labour supply which occurred during the 1940s and 1950s. This barrier to the sustainability of the sugar industry was deferred through the wholesale mechanisation and chemicalisation of the industry. However, whilst this may have negated a specific threat to the sustainability of the industry, it has engendered a range of alternative forms of unsustainability which are indicated at point #a in the graph. These include: agronomic problems such as the increased likelihood of disease; environmental problems such as salinisation and the over-extraction of water supplies; and economic and social problems arising out of the need to finance modernisation strategies.

Fig. 9.1 **The Mode of Social Regulation and unsustainable outcomes**



Moment #2 in figure 9.1 might represent the cash flow crisis which faced the industry during the 1980s. Responses to this varied, but further modernisation and intensification was the most common strategy. And again, this produced a range of environmentally and agronomically unsustainable outcomes as shown at moment #b. Perhaps the most telling outcome here, however, has been the tendency to undermine the family farm as the mechanisms involved produced high levels of debt and increased the size of viable farm units. What this shows is that strategies tend to produce not only materially unsustainable outcomes, but also new and potentially more profound sources of dysfunction and crisis.

The third moment shown in the figure, #3 might be the deregulatory process which has been enacted from the late 1980s onwards. By this time, the established regulatory system had come to be seen, by the Australian government at least, as being restrictive, inhibitory and a barrier to the efficient modernisation of the industry. Thus it was seen as potentially rendering the industry inefficient and uncompetitive vis-à-vis its international competitors and hence unsustainable within the global sugar economy. However, as has been discussed above, while deregulation may well promote a restructuring of the industry to a form which is more 'efficient', this will clearly involve a range of unsustainable outcomes. These outcomes are likely to be at one and the same time both materially and morally unsustainable and potentially such that they will promote new barriers to the future sustainability of the industry as a whole. In all probability, deregulation will lead to even further intensification of production systems which in turn is likely to exacerbate both agronomic and environmental problems. It is also likely to increase pre-existing pressures on individual cane farms. This is not only morally and socially unsustainable, it is likely to negate the one feature which, more than any other, has allowed the industry to remain sustainable for so long.

In this sequence of moments within the development of the Australian sugar industry we have a series of actions which were more or less effective in addressing specific elements of contradiction and dysfunction. These actions averted the immediate unsustainability of the industry. However, in each of these cases, the sustainability of the sugar industry and the socio-economic formation which it constituted was only achieved at the cost of a range of materially and morally unsustainable outcomes. And, moreover, in each of

these cases new and potentially more profound sources of unsustainability were engendered.

Each of these moments are different and yet they are the same. They are different in that they are specific, but they are hardly singular. All are related to an omnipresent tendency for the industry and the socio-economic formation in which it is constituted to become progressively more unsustainable. Each specific moment of contradiction is just that - a moment in this process. Similarly, the outcomes engendered are contingent and may vary from place to place and at different times, but elements of commonality exists. On the one hand the outcomes tend themselves to be either materially or morally unsustainable. Beyond this, however, they are all partial and incomplete solutions to the industry's problems. In solving specific problems they give rise to new and ever more profound problems. Thus development will inevitably arrive at the moment shown as #n in figure 9.1. At this moment the cumulative contradictions which beset the industry are too profound to be addressed and the formation as a whole becomes unsustainable. Here, the capitals and patterns of social relations which constitute the formation are threatened with immanent devalorisation. Or more succinctly, this is a point where the sugar industry is no longer capable of supporting their value and validity. A key point here, however, is just how profound the cumulative effects of the materially unsustainable outcomes shown at #z are likely to be by this point. Indeed, given the nature of a mode of social regulation which prioritises and ascribes flexibility to economic criteria, it is highly likely that it will be material forms of unsustainability which ultimately prejudice the sustainability of the socio-economic formation. If this is the case we have a mode of development which is intrinsically conditioned to Malthusian crisis.

In the Australian case, both the farming sector itself and the upstream and downstream elements of the formation will be extremely vulnerable at this point. There are two general possibilities as this point is approached. First, increasingly exploitative practices can continue until the ecological and social basis of the industry is totally devalued. Second, the patterns of social relations and the capitals employed within the industry can be devalued before this point is reached. The devalorisation of the nineteen century plantation system is a good example of how devaluing elements of a particular formation can allow a newly structured industry to remain sustainable. Restructuring the pattern of social relations and property rights which existed at the end of the nineteenth century allowed the industry to be sustained.

Similar restructuring might be sufficient to allow the industry to be sustain without recourse to overly exploitative and degrading practices on other occasions.

The restructuring process which is now taking place in the Australian sugar sector will allow the industry as a whole to be sustained through mechanisms which amongst other things devalue family farms. But this is not the form of devalorisation which will avert further material unsustainable outcomes. What is being devalued here is the lives of farmers and their families who are little more than a proletariat. The interests of capital are not being prejudiced, rather the reverse. Family farmers are being disenfranchised in order that existing capitals and power structures can be sustained. The necessary forms of devalorisation are more radical than this.

As was the case in Barbados, events in Australia can be seen as involving a process through which the unsustainability of some elements of a particular socio-economic formation is averted through mechanisms which translate largely inconsequential 'relational unsustainability' into various forms of more consequential 'material unsustainability'. Whilst the processes and mechanisms involved here do not always act directly to cause unsustainable outcomes, they tend to create conditions in which such outcomes are always likely to be realised. For instance, the promotion of irrigation in semi-arid areas such as exist in some parts of Queensland will tend to promote salinisation. In realist terms, whether or not salinisation actually occurs may be dependent on contingent conditions. And indeed where irrigation has been adopted in Queensland salinisation has not always occurred. But it has occurred in some locations. Similarly the increasingly intensive use of chemical fertilisers has not always created problems with runoff, but it has on some occasions. And again whilst modernisation strategies have not resulted in all the farmers concerned experiencing profound financial difficulties, a great many farmers certainly have. Thus it seems that whilst modernisation may well have served the individual interests of some in the industry it has also involved the promotion of a range of unsustainable events.

The 'mode of development' which has existed in the Australian sugar industry has tended to produce a range of unsustainable outcomes. But, in practice, specific unsustainable outcomes have normally been addressed as just that - specific, material, discrete problems. Indeed a whole institutional structure exists in Australia to do precisely this. This is clearly inadequate from a

sustainability perspective. Treating the symptoms is never likely to cure the disease or in the end save the patient. Specific regulatory measures, be they environmental legislation, a social security safety net, or the institutionalised development of new production technologies will not produce sustainability. Approaches which attempt to address sustainability directly in this way are limited in their scope and may even be counter-productive. Potentially more effective approaches need to understand the causality of unsustainable practices and events more fully. In particular, they need to be based on an appreciation of how unsustainable modes of development are able to achieve social and political legitimacy.

Unsustainable practices and events can usefully be understood as the outcomes of social and economic processes. From this perspective, what events actually come about depends on: (a) the mechanisms involved; (b) contingent conditions and (c) on whether or not the mechanisms involved are activated. The Australian case demonstrates quite clearly how a particular mode of social regulation can condition the nature of development in a particular way. In practice, the institutions, values and norms of behaviour which form the mode of social regulation constitute the constraints and enablements which serve to activate the mechanisms which are present. They do this in a biased and selective fashion and because of this they condition the nature of actual events. The mode of social regulation existing in Australia has ascribed priority and flexibility to a particular object of regulation and it has predicated an unsustainable pattern of development involving a range of specific materially and morally unsustainable outcomes. It has conditioned development to the unsustainable.

In this case, modernisation can be seen as a key mechanism involved in the process of translating relational unsustainability into material forms of sustainability. Certainly, there were a number of specific mechanisms involved here including, for example, mechanisation and chemicalisation of sugar production. Beyond these we might ascribe some considerable significance to the increasing penetration of up and down-stream sectors of the industry; a financial system which promoted high levels of debt; an institutional structure deeply embodied in a technocratic approach to development and so on. Each of these latter factors served to create a context in which modernisation appeared to be the most viable option to the individual farmer.

An interesting and perhaps fundamentally important question arises as to whether the mechanisms involved here represent the expression of objective strategy by some of the actors involved. In the Barbados case, it did appear that much of what occurred was a more or less direct consequence of purposive and objective strategy. But Barbados is a small island in which it may be unusually easy for those with power to promote a particular strategy. The situation is less straightforward in Australia. A more reasonable analysis here suggests that whilst there is clearly strategy at work, what actually occurs in practice has more to do with struggle and experimentation than strategy *per se.* This would certainly be the regulationist interpretation. Individual interests, within the scope of their rationality and potential, formulate and promote strategies, some of which attain validity and consequence other of which don't. But again as was the case in Barbados, the validity and potential of the mechanisms involved are dependent on the legitimating and enabling role played by various elements of the mode of social regulation. Those unsustainable outcomes which have occurred in actuality have not been realised simply because various interests within the sugar industry wished to promote a particular form of development. They actually occurred because these interests have been successful in promoting this type of development. And in large measure this success has itself been dependent on a variety of social institutions and values which have served to legitimate, empower and enable this agenda.

9.6 **Summary**

For almost a century the Australian sugar industry operated as a more or less stable formation. But now it seems that this formation is increasingly unstable. A particularly severe and prolonged period of low prices on the world market for sugar has accentuated pre-existing tensions and contradictions, threatening both the formation as a whole and within this the viability of the various sectors of which it is constituted. As particular contradictions have emerged strategies have been formulated and promoted to offset these. Often these have been successful in a very narrow sense. Immediate threats to the sustainability of the industry and at least some of its constituent elements have for the most part been averted or postponed. But almost inevitably new and often more profound sources of disequlibrium have emerged. And as the contradictions threatening the industry have become more acute, appropriate responses to these have necessarily become more exploitative. Thus whilst

particular elements of the formation have been, temporarily at least, successful in maintaining the viability of their own positions, a whole range of unsustainable outcomes have been promoted and indeed realised. What has occurred here appears to be very similar to the patterns of development which have been experienced in Barbados - what might been seen as relatively inconsequential instances of 'relational unsustainability' have been translated into various forms of 'material unsustainability'. The principle mechanism involved here seems to have been the promotion of 'modernisation' within the industry. However, this mechanism is at best a partial and temporary expedient rather than the basis of a truly sustainable industry. If a more sustainable system is to emerge, more radical solutions than the palliative and essentially conservative measures now being enacted are clearly necessary.

The Australian sugar industry is currently undergoing a period of adjustment in which the traditional family based farming system is being replaced by a new structure involving much larger agricultural units. This transition is not proving to be a costless exercise, involving as it does the promotion of a range of unsustainable events and practices. An important point here is that while this restructuring appears to involve change, what it actually achieves is the reproduction of the key structures involved in the established socio-economic formation, albeit at the cost of materially and morally unsustainable outcomes.

If sustainability is perceived as a dynamic condition, then it soon becomes clear that elements of extant formations need to be devalued before new and more viable formations can emerge. What both this case and the Barbadian experience seem to show is that in practice this devalorisation tends to be realised in the form of materially unsustainable events. It tends to be the environment and the weakest sectors of society which are devalued. However, what is not so clear is whether this needs to be the case. It may well be that the devalorisation of other aspects of the formation may be equally sufficient. The structure of the formation can change in ways which do not involve the over-exploitation of resources and the promotion of the materially unsustainable outcomes. Certainly, it is possible to envisage transformations in which the material basis of sustainability is not devalued. That is, forms of restructuring which involve a transformation of the relational structures of the formation rather than any redefinition of the system parameters or its material basis. The devaluation of the Australian plantation system which occurred in the late nineteenth century clearly shows how this can work in practice. The

key point is that new and viable formations can emerge from the old, but only when some elements of the old are devalued. Current modes of social regulation are such that they constitute conditions in which it always tends to be the materially significant that is devalued, but it may well be that the devalorisation of much less significant structures within the formation would be sufficient.

In practice, it does seem to be the case that particular socio-economic formations tend to be unsustainable. Capitalistic formations appear to generate disequilibriating tendencies which act as barriers to their own reproduction. In itself, this form of unsustainability is largely inconsequential - there is no particular value in any particular socio-economic formation. However, as they currently operate, modes of social regulation serve to preserve such formations *per se* rather than the material basis of future sustainability. Extant modes of social regulation validate and empower mechanisms which sustain the structure of particular formations and within this particular sets of social relations. In doing this they condition development to the unsustainable. Within any particular regime they encourage and enable the adoption of progressively more exploitative processes and thus they create a condition in which materially and morally unsustainable outcomes become almost inevitable. Developments in the Australian sugar sector support this interpretation. For all the espoused concern over the environment, for all the institutions and values which ostensibly ensure ecological and social sustainability, the regulatory regime as a whole is governed by an object quite separate from these concerns. Both the regulatory regime which has operated within the sugar sector and the wider mode of social regulation in Australia have been inherently conservative, they have been uniquely concerned to reproduce rather than transform the basic structures of the sugar sector. Because of this, they have conditioned development towards the unsustainable.

Chapter 10 THE CONDITION OF SUSTAINABLE DEVELOPMENT

This chapter reconsiders the conceptual framework and approach to sustainability developed in the initial chapters of this thesis in the light of the results obtained from the case studies. The model linking unsustainable outcomes with structurally defined causal factors developed in chapter 3 is re-evaluated. Particular consideration is given to the ways in which causal mechanisms are 'activated' by modes of social regulation and the ways in which this 'conditions' the nature of development. The next section of the chapter considers how this conditioning might be modified and what relevance this analysis may have regarding how sustainable development might be articulated in the general case. The chapter concludes with an overall evaluation of the approach to sustainability and methodology developed in this project and suggests how this approach might be further tested, refined and progressed.

10.1 Transcending the impasse

If development is perceived as a moral concept involving progressive improvements in the human condition, the poverty, deprivation and inequality which pervade the world of the late twentieth century leave little room for complacency. Moral imperatives aside, there are also good reasons to believe that current modes of development are also prejudicing the future of society in ways which are not only material and absolute, but also quite pressing. However, while examples of the morally and materially unsustainable abound, it is all too apparent that most extant attempts to articulate and operationalise sustainable development have proved to be inadequate.

Sustainable development has come to be seen as a utopian and impracticable idea not because the concept itself is unimportant, but rather because current approaches to the idea are inadequate to allow it to be achieved in practice. Although the nature of present day modes of development is such that various forms of unsustainability are the norm, most current attempts to promote sustainable development still focus on the outcomes produced rather than the underlying conditions which cause these to come about. Implicitly, at least, most current approaches concern themselves with where some line should be drawn and how it should be policed. The case studies included in this thesis reinforce the contention that such approaches are, in themselves, insufficient to ensure sustainable development. The Australian case in particular, where 'sustainability' is an explicit goal of a range of governmental and quasi-governmental agencies, is a telling example of the deficiencies of what Redclift (1988:638) terms 'environmental managerialism'. The potential of such

approaches is manifestly limited. By working backwards from the bottom line of biologically or morally defined sustainability metrics, approaches of this type fail to respect either the multi-dimensional nature of sustainable development or the need for truly integral solutions which this implies. Attempting to define this line more objectively, or searching for new ways of policing the line, will not produce sustainable development. The aim of this project was not to retread these well-worn paths. This thesis was not concerned to define in some more 'objective' way what is or is not sustainable in Barbados and Australia. Rather the research started from the premise that this sort of sophistry has not succeeded and will not succeed. What this thesis has attempted to demonstrate is that although trying to define precisely what is or is not 'sustainable' in a particular place and time is impossible, this is hardly a problem because this sort of 'objectivity' is neither necessary nor appropriate.

The key question for this research was not where the line should be drawn but why it will always tend to be crossed wherever it is located. Approaches which begin from this position have the distinct advantage that they largely by-pass the need for any quantitative definition of exactly what is and is not sustainable. From this perspective, sustainable development is, as Yanarella and Levine (1992:770) suggest, more usefully defined in terms of equilibrium and relationships than in terms of 'metrics' or 'limits'. The only extant approach to sustainable development which claims to address the concept in something akin to this manner is that formulated around environmental economics. But this approach is demonstrably flawed (O'Riordan, 1991; Redclift, 1987; Dickens,1992; Jacobs, 1994). Rejection of the key assumptions underpinning environmental economics, especially those which see capitalism as an equilibriating process, posits the significance of regulation theory which is centrally concerned with the disequilibriating and crisis prone nature of capitalist accumulation systems (Aglietta, 1979). Insights from regulation theory are potentially informative, not least because the central concern of this project is to understand why overly exploitative and degrading practices come about and how they are able to achieve their own social and political legitimacy.

Implicit in the critique of extant approaches to sustainable development articulated in chapter 1, was the contention that most of these have proved to be less than adequate because they have remained trapped with a positivist paradigm. This thesis has attempted to contribute to thinking on sustainable

development by reconsidering sustainability issues within an ontological and epistemological framework defined by critical realism. In so much as critical realist thinking was derived from a rejection of more positivist ontologies, it potentially provides an opportunity for the development of a more nuanced and powerful understanding of why and how the unsustainable comes about.

From a realist perspective, objects and structures give rise to tendentially expressed mechanisms which interact with contingent conditions to produce specific events. As the case studies demonstrate, it is possible to seek to prevent unsustainable events at the level of contingency. In the Australian sugar industry for example, it has been assumed that environmental problems, such as those associated with water extraction and irrigation, can be adequately addressed through a combination of regulatory controls and various technical fixes. Measures of this sort are clearly ineffectual and inadequate not just in the Australian sugar sector but also in the general case. What the realist mode of explanation does is to offer the potential to address different moments or levels of causality. When causality is viewed in realist terms, one alternative to addressing unsustainable events at the level of contingency would be to seek to transform the objects and structures which produce the mechanisms involved. The impotence of attempts to construct various ISAs supports Dicken's (1992) suggestion that effective intervention at this level is 'unlikely'. However, it may not be necessary - the realist mode of explanation suggests other possible moments where intervention might be possible. Outcomes depend not just on whether a particular mechanism is present, but equally on whether or not that mechanism is activated. In theory at least, it may well be possible to moderate the actuality of development by influencing this process of activation. Thus, for example, while capitalism will always produce mechanisms which will tend to promote unsustainable outcomes, it may be possible to prevent these mechanisms being empowered. The regulation of sustainable development is either impossible or ineffectual at both the levels of structure and contingency. It might, however, be possible to regulate the relationship between these levels, for it is this structuration which conditions the actuality of development.

In capitalist societies whether or not mechanisms are activated is largely a function of the prevailing mode of social regulation. By its nature, a particular mode of social regulation will tend to legitimate, empower and activate a particular type of mechanism. Thus particular modes of social regulation condition development to particular types of outcome. Modifying this

conditioning in ways which will promote more sustainable modes of development may be possible. But purposive modifications depend on an appreciation of what mechanisms are significant and how their expression is influenced by the conditions in which they occur. This kind of understanding can only be achieved through the analysis of past and present day struggles experienced within the mode of social regulation. The research conducted for this project was largely concerned to 'unpack' such struggles to better understand how the ways in which they are resolved tends to condition the nature of development.

10.2 **Conditions of unsustainability**

The model developed in chapter 3 of this thesis attempts to link the disequilibriating tendencies of capitalist accumulation systems with a tendency to engage in progressively exploitative and ultimately unsustainable practices. In this model, unsustainability is not considered in absolute terms; rather it is understood as the likely outcome of the dynamics of capitalist accumulation systems. Regulation theory is fundamentally based on the contention that capitalist economies are not equilibriating. This is the antithesis of neo-liberal economic theory which not only sees the market as an equilibraiting process, but also suggests that it will produce patterns of development based on comparative advantage, and thus that it will maximise overall welfare. These tenets are reflected in neo-liberal approaches to sustainable development. The logic of such arguments is simple enough. In the sugar sector, for example, inefficient, uncompetitive producers, such as Barbados, will be replaced by more productive industries in other locations. The market will ensure that sugar is produced in those locations which have the greatest degree of comparative advantage. More sugar will be produced more cheaply and overall welfare will be improved. In effect, more needs will be met - development will have become more sustainable. The case studies of sugar production included in this thesis problematise both the probity and practice of such neo-liberal interpretations.

The history and current situation of the global sugar economy demonstrates that intervention and protectionism are an omnipresent and practically inalienable feature of such economies. They have existed almost since the inception of a global sugar economy in the seventeenth century and they remain of the most profound significance today. GATT and the Cairns Group

aside, this is hardly likely to change. Not only do a great many sugar producers formulate policy inappropriately because they respond to short lived and unrepresentative price hikes; it is also common for non-economic criteria to be employed in policy formation. The Common Agricultural Policy is a good example of this in the developed world. In the South, many countries have developed sugar industries with the expressed intent of import substitution or simply because this is a relatively easy sector in which to become established. Equally, countries such as Barbados, have been reluctant to see established industries collapse for a whole range of reasons, many of which extend beyond the purely economic.

The Barbados case represents a good example of how the logic of comparative advantage can become blurred. Historically, conditions in Barbados and throughout the Caribbean were such that this region was particularly well suited to cane sugar production, and the industry thrived for many years. More recently, technological development has undermined this advantage. Conditions in Barbados have hardly changed but the technology and techniques of sugar production have, and the island can no longer produce sugar cost effectively; better then that sugar should be produced elsewhere and that Barbados should further develop its tourist industry. But the situation is not this simple. On the one hand the island's historical commitment to sugar and the existence of fixed assets on the island mean that any transition to a more appropriate form of development is always going to be traumatic; and this is made even more problematic by the likely environmental consequences of a collapse of the sugar industry. Moreover, what seems to have happened in Barbados is that the move from sugar has been orchestrated by a small but influential elite group who have been more or less successful in putting their self-interests before 'development' *per se*. The very fact that the transition has, in some ways at least, been orchestrated undermines the logic of market-led development. Certainly the opportunities open to this group, and equally the constraints in which they have operated, have served to delimit the nature of development there, but the precise structure of Barbadian development has been moulded to class interests rather than the general welfare of the island's population. Within this, tourism is virtually the only alternative industry which the island has the potential to develop and thus, golf courses aside, much of the land in Barbados is likely to be under-utilised or simply abandoned. Total unproductivity hardly seems to be commensurate with fulfilling human needs - it cannot be an optimum solution given such an objective. Thus while the Barbadian sugar industry is

neither viable by virtue of what it is, nor capable of being maintained, its progressive demise hardly amounts to 'sustainable development'.

Unlike the case in Barbados, conditions in Australia are more appropriate to mechanised sugar production. Indeed, technological development has effectively served to benefit the Australian industry. In practice, the Australian industry has striven to maximise this comparative advantage through an almost unbridled commitment to modernisation. Even here, however, where environmental conditions and the social and institutional situation cede the industry what appears to be a high degree of competitive advantage, the industry is not only beset by intense economic pressures, it is also becoming increasingly environmentally and socially 'unsustainable'. Not only has the mode of development which has occurred in the Australian sugar industry involved a range of progressively severe environmental impacts, the dynamics of the industry have also tended to create internal barriers to it future reproduction.

For several decades Australia has been more exposed to the effects of the global sugar economy than any other country; and events in and around the Australian sugar industry cannot be meaningfully interpreted outside this context. Although most explanations of crisis in both Australia and elsewhere have focused, quite inappropriately, on the effects produced by short term volatility in the sugar price, the underlying downward trend in the sugar price is clear enough and considerably more significant. Sugar prices have, in real terms, been falling more or less consistently at least since the mid-nineteenth century. The dramatic fall in prices engendered by the development of new production technologies and the European beet sugar industry during the last century were initially ameliorated by the transition to mass consumption which Mintz (1985) describes. This option of expanded consumption is no longer available within the global sugar economy - consumption is only likely to increase in the South and then only moderately. In practice, cane producers not just in Queensland but throughout the world have to compete for their markets within a context where structural over-production in a competitive economy places constant downward pressure on the sugar price and where the only potential to ensure a cost competitive product lies on the supply side. This has created a situation in which incremental efficiency gains have become a fundamental component of economic sustainability. This process is 'unsustainable': (a) because it cannot continue indefinitely; and (b) because of the environmental and social impacts it engenders. It is analogous to the

rhetoric of 'sustainable economic growth' which has become the watchword of governments throughout the world, and just as growth of any other kind is logically unsustainable, growth in the sugar industry or elsewhere cannot be achieved indefinitely. In practice, static demand has meant that 'economic growth' in the sugar sector has effectively meant seeking ever greater efficiency and this has necessitated the adoption of production methods which are increasingly exploitative and damaging to the wider environment. However, despite the adoption of ever more 'efficient' production systems, the Australian sugar sector has now reached a point where a more radical restructuring of the industry has become almost unavoidable. The social and moral consequences of this restructuring are likely to be profound enough, but an even more telling point lies in the way in which this process is undermining many of those central features of the established system which allowed it to remain sustainable throughout most of this century. Even if the environmental and social contradictions currently emerging within the Australian sugar industry are not profound enough to render the industry totally dysfunctional, the progressive achievement of efficiency gains will always reproduce current patterns of overproduction. As these case studies show, market led development tends to involve fewer producers producing sugar within narrower margins. When this process is repeated throughout an economy, the ability to consume sugar or any other commodity is always going to be compromised by the fact that not enough people have the means to consume the sugar however cheap it may be. The actuality of this is manifest in the dozens of Southern sugar producing countries where poverty remains the norm. This would have little significance if the sugar sector were unique, but surely it is not. The sugar sector may have singular characteristics, but the logic of the dynamic which defines its momentum is far more general.

The global sugar economy simply does not function in a manner which maximises overall welfare. Rather it serves to undermine the sustainability of sugar production even in the most appropriate locations. Certainly sugar is cheap and getting cheaper (although it is still not cheap enough for many millions in the South), but the mechanisms which have depressed the price of sugar on the world market have led more or less directly to a whole range of increasingly exploitative practices. Although modern production systems may indeed be intrinsically more efficient than those which they have replaced, the gains achieved are never enough. In practice, technology and modernisation are no more than temporary expedients; they are merely part of a process which requires ever more exploitative forms of accumulation. While the unity

of the mode of social regulation which legitimates and enables the mechanisms and practices involved remains intact, increasingly profound outcomes will continue to be realised in practice. Whether or not the practices involved or the specific events they have produced are 'unsustainable' in a particular location and time is hardly significant. What is important, and what is clear enough, is that the progressive nature of this process means that sooner or later these practices and events will transgress into the unsustainable however the notion is defined.

The problems of the world's sugar industries are not simply problems of market failure or of protectionism, support for domestic industries or the discounting of indirect or future costs. In practice, the capitalist dynamic effectively necessitates the adoption of increasingly exploitative practices and hence it tends to engender outcomes which are variously environmentally and morally unsustainable. In Guyana, Brazil, the Philippines and throughout the South, landless labourers toil in cane fields for a few dollars per day. In Australia, farmers mine water, degrade the environment with chemicals and exploit themselves and their families as they struggle to remain viable in the face of increasingly inauspicious conditions. In Barbados and on other Caribbean islands, potentially productive land is abandoned and left to erode. Capitalist development may or may not be equilibriating. What is certain, however, is that its momentum currently produces a whole range of unsustainable practices and events.

This perspective requires that the notion of development itself, not just sustainability, is problematised. Development is usually taken to be a progressive concept implying increased human well-being. This is surely the sense in which it is used in the idea of 'sustainable development'. There is a problem here of conflating development, which is progressive in this sense, with transformations which simply reproduce key structures within a capitalist mode of production. This ambiguity is reflected in the inconsistent and often discordant ways in which the term sustainable is used both in theory and practice. As this research has demonstrated, even within one industry, notions of economic, social and environmental sustainability are used collaterally with insufficient consideration being given to just what should be or can be sustained. Within the sustainability literature (Redclift,1991), and in practice, it is often assumed that sustaining each of the economic, social and environmental dimensions of the concept is a

prerequisite to achieving sustainable development in some holistic sense. The analysis here questions the logic and propriety of this assumption.

By their very nature of what they are, capitalist modes of development are dynamic and transformational. That is not to say that such dynamism is necessarily progressive. As the model developed in chapter 3 suggests, attempts to sustain economic growth and the validity of particular patterns of social relations are linked, more or less directly, with increasingly profound forms of exploitation which have been legitimated within modes of social regulation. This interpretation is supported by the case studies, and is hardly in doubt in the more general case. What remains to be seen is whether or not this is unavoidable.

Whether or not one seeks to rationalise this in Marxist terms, through concepts such as a tendency to overaccumulation or a falling rate of profit, particular capitalist formations, particular capitals and particular class structures, do tend to dysfunction and crisis. Certainly, this has been clear enough in the case studies included here. Capitalist socio-economic formations are insecure and ephemeral by virtue of the competitive conditions in which they occur and the exploitative basis of what they are, and thus they need to be 'sustained' through various combinations of legitimation and coercion. Dynamism and transformation are engendered not simply through apparently exogenous factors such as technological development, but also through internally generated contradictions. These contradictions necessitate change. Historically this process of change has involved a range of materially and morally unsustainable outcomes because of the ways in which emerging contradictions have been addressed. Development has been conditioned to the unsustainable.

The more or less constant emergence of contradiction and potential dysfunction within the case studies included here is apparent enough. What is also clear is that while the contradictions which have emerged have been addressed in ways which often appear at least to be more or less effective, the solutions which have been applied have been partial and temporary. In practice, the sugar industries in Barbados and Australia have remained operational and the patterns of social relations which they support have been reproduced through mechanisms which serve to externalise contradictions rather than through measures which address them directly. Contradiction has

been exported either geographically or temporally rather than negated. This process cannot be sustainable either environmentally or socially.

When the early planters in Barbados encountered problems of severe soil erosion, they invented the cane hole. Soil erosion was checked, but the large amount of labour needed to prepare the land in this way engendered new problems, new sources of dysfunction. These new contradictions were addressed through the use of slave labour. Again this proved to be an incomplete solution as slavery became an increasingly dysfunctional and ultimately untenable basis for production, and by the late twentieth century cultivation methods have returned to those used in pre-slavery times and soil erosion is once again a problem. In Australia, a variety of pressures have served to prejudice the economic and social basis of the cane farming sector, and whilst farmers have attempted to maintain their viability through mechanisation and chemicalisation, it now seems that the days of the family cane farm are numbered. This is a situation which is both ironic and tragic. The irony lies in the fact that the current restructuring of the Australian sugar industry appears to involve a return to a structure involving fewer but larger farming units. In effect, it is a return to a structure very similar to the plantation based system which existed in the nineteenth century. The tragedy is twofold. On the one hand, a return to a plantation system hardly seems to be progressive and certainly the restructuring is unfortunate for many present day farming families. But perhaps even more tragic than this is the fact that the struggles through which these farming families have sought to protect their positions and the value of their assets have involved both a high degree of self-exploitation and practices which have had progressively severe and by almost any standards unsustainable impacts on the environment.

Analysed in this manner, these cases studies support the general model based largely on theoretical categories derived from regulation theory which was outlined in chapter 3 of this thesis. Certainly, the emergence of contradiction in the Barbadian and Australian sugar industries appears to reflect the regulationist categorisation of crisis outlined by Moulaert and Swyngedow (1989:329). There are 'short conjunctural crises' which can be offset by measures such as technological development or through the acquisition of new markets. These measures are inherently conservative in that they serve to reproduce the extant socio-economic order. There are also more basic crises which require qualitative changes in the accumulation process. The restructuring involved in this sort of change is potentially, at least, much more

radical in that established capitals, property rights and patterns of social relations become vulnerable at this stage. In practice, however, as the case studies demonstrate, the types of shift which occurs in these circumstances often involve the reproduction of established structures rather than any truly radical transformations.

If we accept that general crisis in a regime of accumulation is necessarily constituted in dysfunction within particular sectors, the recent histories of both the Barbadian and Australian sugar industries would seem to verify the existence of both of these types of crisis. In both of these locations various forms of contradiction have tended to emerge more or less consistently. Up to a point, it has been possible to address the problems produced through minor adjustments which have served to maintain the formational status quo. Eventually, however, in both of these cases a point has been reached where incremental technological changes and the like have become inadequate to maintain the viability of the industries and a period of restructuring became inevitable. Recent events in Barbados and Australia would also appear to support the contention that the measures which have been employed to avert both types of crisis have tended to involve increasingly exploitative and ultimately unsustainable practices. In this sense, a direct relationship exists between the nature of the global sugar economy and a whole series of materially and morally unsustainable outcomes in rural Queensland. Established realist methodology suggests that this relationship can be confirmed and better understood through a process of retroduction which focuses on the causal mechanisms involved.

In the Australian case, two of the key mechanisms involved have been modernisation and debt. In practice, modernisation has been no more than a mechanism through which production could be made more 'efficient'. A falling sugar price has obligated 'leaner', more 'efficient', production and in practice this has effectively meant the adoption of ever more exploitative production techniques. The outcome of this has been a range of increasingly profound environmental impacts and the progressively severe exploitation and eventual disenfranchisement of a large number of farmers. A clear link also exists between the modernisation process and the pervasive and frequently overpowering levels of debt which exist within the Australian sugar industry. It is easy enough to understand why individual farmers faced with unserviceable levels of debt tend to resort to pragmatic measures with scant regard for their long-term consequences in often desperate attempts to meet their immediate

commitments. However, most of this debt reflects not simply the particularly low sugar prices of the 1980s, but also the purchases of technology and land made by farmers who wished to become more efficient in order to remain economically viable. Somewhat ironically, the high and untenable levels of debt which abound amongst Australian cane farmers are a key factor underpinning the current phase of restructuring. Certainly, unserviceable debt burdens make farmers likely to lose their land to larger and better capitalised concerns. Restructuring makes the industry viable again, at least in the short-term, because a new equilibrium is achieved as some aspects of the established industry structure are devalued. In practice, however, it is the livelihoods and lives of the farmers and their families which are being devalued rather than any of the more powerful elements of the established formation.

In so far as the modernisation process has been forced upon the Australian sugar industry by a progressively falling sugar price, it would seem clear enough that the nature of the global sugar economy has been a significant causal factor underpinning unsustainable events in Queensland. Thus it might well be argued that a 'substantial' or 'internal' relationship exists between the nature of the global sugar economy and various unsustainable events. However, the situation is not so straightforward. Actual events in Queensland also reflect the fact that the mechanisms involved here were activated. From this perspective, it is not simply the nature of the global sugar economy or mechanisms such as modernisation and debt which are unsustainable. Equally problematic are those elements of the mode of social regulation which 'selected', validated and empowered these mechanisms.

In Barbados, many unsustainable events such as accelerated soil erosion, have been underpinned by the large scale flight of capital from the sugar sector. In large part, this reflects the penetration of specifically capitalistic accumulation processes into the island's economy. On the one hand, the plantation system had clearly become anachronistic and contradictory. For example, difficulties in ensuring an adequate labour force became increasingly problematic as internally generated tensions were complimented by emergent employment opportunities in the tourist sector. But beyond this, it also seems that the incorporation of Barbados within the international tourist market and an increasingly globalised food system have provided new and apparently more attractive investment opportunities for the capital previously employed in the sugar sector. In this sense, it was not simply the inherently inefficient

nature of the plantation system or the environmental constraints faced by the Barbadian sugar industry which have rendered it dysfunctional. These may well have been significant factors, but given that the plantation system did produce sugar for over three hundred years and the preferential nature of Barbados' EU quota arrangements, they hardly provide a full or convincing explanation. Equally if not more significant than these has been the emergence of new and more profitable sources of accumulation. The problem in Barbados has not been so much that sugar could not be produced profitably (at least within the protected and subsidised context in which it takes place), but rather that it has become relatively unprofitable compared with tourism or overseas investment opportunities. So, in so much as the removal of capital from the sugar sector has been significant in producing a range of environmental and morally unsustainable events, a clear enough relationship exists between these events and the penetration into Barbados of more purely capitalist accumulation processes than had previously pertained.

However as has been the case in Australia, the actual mode of development and the specific 'unsustainable' events which have occurred in Barbados cannot be fully explained in these terms. Actual patterns also reflect the existing power structures on the island and the nature of the mode of social regulation. Just as the nature of the institutions and social values existing in Australia fundamentally validated and enabled the modernisation process and thus had a key influence on the pattern of development there, conditions in Barbados have served to licence and to some extent direct the nature of development in that location. The political and institutional conditions and the broader mode of regulation existing in Barbados conditioned development towards particular outcomes. Several factors have been important here. On the one hand, 'regulation' in the narrow sense of the term is not particularly effective on the island. Equally however, the Barbadian government has adopted increasingly liberal economic policies, largely in acquiescence to pressure from the IMF. The establishment of institutions such as the Barbados Securities Exchange, and the now very liberal approach to financial regulation on the island have significant implications. The tacit acceptance of the congruence of economic and political power on the island has also been important. In practice, these factors have allowed an elite group to sustain its own position through mechanisms which devalued more materially and morally significant aspects of development on the island. Whilst it is clear enough that the situation in Barbados was such that this type of outcome was always likely, it is equally clear that it was not inevitable.

What emerges in both case studies is not only the 'bounded rationality' of those who face problems and the subjectivity of their strategies, but also the ways in which their responses are selectively invalidated or empowered by the conditions in which they are articulated. On the one hand strategies are conditioned by the fact that emergent contradictions tend to become increasingly profound the longer the established regime is maintained. Thus appropriate responses tend to become more and more exploitative as time passes. Beyond this, the nature of the strategies is also conditioned by the perceived and actual opportunities and constraints experienced by the key actors and groups involved. In Barbados, the economic and political power of the elite group has produced particular outcomes. In Australia the pattern of development has been fundamentally conditioned by the institutionally and culturally defined ethos of the industry and the broader ideology of deregulation. In both the case study locations, those involved in the sugar industry, planters, farmers, millers, politicians and so on, have all attempted to address specific problems as they have emerged, but the types of strategies which have been devised and which have actually been 'successful' have been largely determined by the institutional and social context in which they were formulated and promoted. Analysis of the Barbadian and Australian sugar industries supports the contention that effective policies for the promotion of sustainable development need to be formulated around a more substantive appreciation of how modes of social regulation condition the nature of development. Development is currently conditioned to the unsustainable not simply because it occurs in an exploitative and disequilibriating capitalist system, but also because the established modes of social regulation ascribe particular and arguably inappropriate and unnecessary priority and flexibility to specific elements of that system.

In general terms, the contradictions which arise and prejudice established accumulation systems and social structures can be addressed in various ways. Production costs can be reduced and markets can be expanded either geographically or through the provision of credit. Each of these mechanisms is apparent in recent patterns of development and each tends to be closely associated with various forms of unsustainable development. For example, overaccumulated nationally based capitals have been widely translated into international capital - perhaps the final and most destructive of all relational formations. Overaccumulated national capitals, unsustainable in a domestic context, have become international in attempts to maintain their validity

through the acquisition of new production and consumption bases. (If one considers the history of colonial expansion by the European powers this is clearly neither a unique or new process). The direct consequences of such neo-colonial expansion have included high levels of Third World debt and in many cases the severe over-exploitation of southern resources. In practice, of course, geographical restructuring is in itself only a temporary measure as new contradictions inevitably emerge. A key feature of international capital however is that it is not possible to move again to a larger scale and the only recourse is to more exploitative forms of accumulation.

Within these processes neither the environments nor the populations of particular localities hold any particular significance. The demise of traditional industries (though not usually of the capitals on which they are based) is in itself stressful, but this pales into relative insignificance as new contradictions emerge within subsequent formulations. In these circumstances, increasingly exploitative practices appear to be both necessary and appropriate, and thus we witness massive over-exploitation empowered, if not totally legitimated, through mechanisms such as hegemony, international debt and in the extreme case by force of arms. Consider the role of the World Bank and the IMF, the GATT process or various military interventions in the South. Within this manifest and increasingly pervasive expression of the unsustainable, TNCs and the capitals they embody have for the most part remained viable. But their viability has been ensured in ways which undermine the true basis of sustainability. This is not sustainable development. The achievement of sustainable development requires that the reasons for this prioritisation and the conditions which ascribe flexibility to particular and nonessential objects of regulation are re-examined and redefined.

10.3 **Conditions of sustainability**

The picture which emerges from the case studies investigated in this thesis is one which supports the general model constructed in chapter 3. The analysis confirms the relationship between the capitalist dynamic and a tendency to adopt increasingly exploitative, and ultimately unsustainable practices. The particular socio-economic formations analysed have tended to become increasingly stressed through time, and whilst this has remained possible, inherently conservative measures including, labour coercion, agricultural modernisation, the exploitation of small farmers and protectionism have been

promoted in attempts to maintain the validity of these formations. However, whilst measures of this sort have often been sufficient to reproduce the validity of established patterns of social relations in the short term, they have also tended to degrade either the environment or the lives of some members of society. Indeed, as the case studies considered here demonstrate, they currently often do both. Moreover, ultimately measures of this sort have become insufficient to sustain the status quo and a more radical phase of restructuring has become unavoidable. Even here, however, it has tended to be materially and morally significant environmental and human resources which are devalued rather than the extant relational structures of society. In this sense, both of the case studies do support the theoretical constructs employed in the original model which suggests that increasingly exploitative practices will be legitimated and unsustainable outcomes will tend to be realised for as long as the mode of social regulation as a whole remains intact. In both of the case studies, the particular institutional and social contexts which served to legitimate and empower the mechanisms involved were important in allowing unsustainable outcomes to be realised.

A key question, however, is whether it might be possible to effectively promote more sustainable modes of development by purposively modifying specific elements of the mode of social regulation. Viewing sustainability from a realist perspective is potentially useful in that it presents an opportunity to consider formulating policy in different ways. In particular, such a perspective shows the potential importance of preventing unsustainable outcomes through targeting policy on the institutional and social context in which significant causal mechanisms operate. But building on the opportunities which this different approach presents in theory, depends on a methodology which can signify quite specifically just which values and institutions need to change and how. In itself, the suggestion that sustainable development will be built around value shifts in society is neither original nor particularly profound. However, when links have been suggested between capitalist modes of production and unsustainable patterns of development, the prescriptions which have emerged have tended to be highly generalised and difficult to relate to policy (Murdoch,1992). The methodology utilised in this project has, at least, begun to show how this sort of discernment might be achieved.

The Australian case study paints a picture in which a progressively falling sugar price has more or less consistently created disequilibria within the sugar sector. In simple terms, farm incomes have failed to stay in line with the

costs of production. Up to a point, it has been possible to offset this trend and the unsustainability which it embodies through a series of incremental efficiency gains achieved largely through the adoption of new technology. This process has allowed the established industry structure to be reproduced through almost a century. However, a situation has now been reached where further gains of this sort are no longer sufficient and a period of more radical restructuring has been forced upon the industry. In Barbados the situation has been superficially different, but the process is essentially the same. There, the conditions of the ACP Agreement maintained the effective level of returns to producers, but rising production costs still created a disequilibriated situation. The Barbados case shows that attempts to contrive and manage some form of equilibrium do not work well in practice. The Lomé provisions have hardly created a sustainable equilibrium within the sugar sector and attempts by the Barbadian government to construct such a state through direct support for the industry have also been unsuccessful. Similarly, the profound failure of successive International Sugar Agreements testifies that equilibrium cannot simply be constructed and subsequently managed at a global scale. These failures do not simply reflect the inherent difficulties of managing complex systems of production and consumption; the real problem lies in the fact that such measures attempt to maintain the status quo in a context where this simply is not possible.

This is not an argument in favour of neo-liberal market led approaches to sustainable development. Indeed it is quite the reverse. The suggestion is not that a perfect market without intervention, protectionism or the support for domestic industries which occurs in the sugar sector would produce more sustainable patterns of development. Rather the point is that the inherently conservative measures which are used to sustain extant patterns of social relations within capitalist economies are key causes of a whole range of unsustainable outcomes. Institutions such as the World Bank, GATT and the Cairns group may argue that liberalisation is commensurate with sustainable development but in practice this is not the case. As the deregulation of the Australian sugar sector demonstrates so unequivocally, such liberalisation implicitly licenses the type of conservative measures which translate the unsustainability of extant class structures into materially and morally unsustainable outcomes. Indeed, in so much as developments in Australia are typical of the more general case, the tendency for property rights to become increasingly concentrated under such conditions makes it all the more likely that unsustainable structures of production will be further extended than

would otherwise be the case. The Barbadian experience certainly demonstrates how the congruence of economic and political power can cause this to occur. The point here is, of course, that the longer established regimes are enabled to remain viable the more exploitative the practices they embody will tend to become.

A key issue here is that whilst it is possible to maintain some form of equilibrium in the short term, the measures through which this is achieved cannot be costless. Up to a point, it may appear that equilibrium can be restored through apparently costless exercises, which for example involve expanded consumption, but as the sugar industry demonstrates these are inevitably incomplete and temporary solutions. The relatively short period in which the post-war Keynesian experiment was able to achieve any success suggests that this is also true in the more general case. In the end, mechanisms which are capable of restoring equilibrium within an established socio-economic structure necessarily involve practices which are more exploitative than those they replace. This is the case whether we are considering modernisation of the Australian sugar industry, the national economies of post-war Europe or the present day global economy. In each of these cases established class and core-periphery relations have been maintained through mechanisms which are increasingly exploitative. The key point, however, is that equilibrium could be restored through measures which devalued the capitals and patterns of social relations existing in established economies rather than the environmental and human resources upon which they have been based. The case studies provide a useful example of how this can be achieved. Maintaining adequate labour supplies became a problem on the early Australian plantations. In this case, the dysfunctionality which this produced was obviated by a transition to a production system based on family farms. This transition from plantation-based production to family farms is potentially very significant from a sustainability perspective. The established plantation system had become increasingly stressed and untenable, but the industry was maintained in a relatively benign manner. The environment wasn't subjected to increasing levels of exploitation; and from a social perspective, many more individuals were able to make a decent living than had previously been the case. The only thing devalued in this restructuring was the capital and property rights of the plantation owners - the exact opposite of what is currently happening in both Barbados and Australia. This example indicates one means through which key environmental and social components of sustainability might be maintained through the

transformational dynamic within which development necessarily occurs. In practice, however, this sort of transformation is exceptional. As the case studies demonstrate, even when industries and economies undergo radical phases of restructuring it tends to be the material and moral basis of sustainability which is devalued rather than any less consequential relational structures.

The logic of this is that in a competitive economy established structures are, sooner or later going to be devalued; and trying to extend their validity beyond a certain point may be politically expedient and attractive to those who have most to lose, but it is profoundly inappropriate from a perspective which values the ecological and social components of sustainability. Sustainable development can only occur within the transformational context of the capitalist dynamic. The key is to reconsider what should be sustained and what is expendable within this process. From this perspective, measures to promote sustainable development may well need to encourage the devalorisation of established relational structures rather than preserve them as is the case at present. This may be counter-intuitive, but in the end, particular socio-economic formations and within these particular capitals and class structures have to be and will be devalued. The questions are when and how, not if. As they are currently constituted, modes of social regulation facilitate, encourage and to some extent determine the processes through which largely inconsequential elements of 'relational unsustainability' are protected. Thus they also tend to predicate the 'materially unsustainable' because the protection of one, almost inevitably, tends to involve the promotion of the other. Hence, sustainable development needs to be constructed within modes of social regulation which do not just incorporate environmental and social criteria. They need to delimit and constrain the flexibility currently ascribed to capital and extant power structures. This 'object' of regulation requires redefinition and expansion.

A key problem here is the fact that modes of social regulation come about and achieve validity through a process of social conflict and struggle rather than through any form of objective promotion. New modes of social regulation cannot simply be constructed as entire and valid wholes. However, the analysis here has begun to show that this may not be necessary. New modes of social regulation cannot be constructed *per se*, but it may be possible to disestablish the priority currently ascribed to sustaining the value of capital and the validity of established patterns of social relations.

In Barbados, struggles experienced within the mode of social regulation were resolved in ways which served particular class interests. In Australia, similar struggles were resolved in ways which benefited particular sectors of the sugar industry. In both of these cases, established relational structures were sustained but only through mechanisms which produced a range of materially and morally unsustainable outcomes. Modes of social regulation with different biases would not necessarily have produced these same outcomes. If the mode of social regulation pertaining in Barbados had not been such that it ceded undue priority to mechanisms which merely reproduced the position of the island's economic elite, patterns of development there might well have been somewhat different to what they are today - they could hardly have been any worse. Similarly, had farmers in Australia not embarked so vehemently on a process of modernisation and had not incurred the high levels of debt which so many now have, their situation would hardly be any worse than it is now; and many of the environmental impacts which have occurred in recent years might well have been avoided.

In the Australian case, the current de-regulatory programme is a good enough example of how bias within the mode of social regulation is socially constructed. It is clear enough that de-regulation is an inherently conservative measure which will allow the most powerful elements of the current industry to be sustained at the expense of the most vulnerable. A key point here is that whilst some form of restructuring may have become inevitable, the decision to deregulate the sugar industry was ideologically defined. Notwithstanding an increasingly neo-liberal bias in it's own political agenda, the Australian government's vociferous condemnation of intervention and protectionism elsewhere left it with little option but to 'put its own house in order'. The Commonwealth government may have had only limited room for manoeuvre, but alternatives did exist. In practice, deregulation was determined as much by ideology, political pressures and expediency as by any teleological determinism inherent in the nature of the context in which the sugar industry operates.

Modes of social regulation are not socially constructed *per se*, but they are clearly imbued with bias not just in Australia but throughout the world. Currently, this bias is generally associated with a perceived need to reproduce the value of capital and existing power structures and environmental and social goals are marginalised. However, as this research has demonstrated,

the achievement of sustainable development depends just as much on constraining the flexibility of capital as it does on prioritising environmental controls or legislation to protect the most vulnerable in society. There is a fundamental need to re-evaluate current systems of property rights and particular those elements of regulation which facilitate the mobility of capital. In Barbados the sugar industry has clearly been prejudiced by a whole range of contradictions, but the unsustainability of the current mode of development has been profoundly influenced by the ways in which capital has become freer to move both within and out of the island. In Australia, the industry has clearly been prejudiced by a falling sugar price, but the plethora of environmentally and socially unsustainable outcomes which occurred have been specifically conditioned by the wider mode of social regulation and the increasingly neo-liberal position of the Australian government. This is also true in the more general case. The political agenda throughout the world is increasingly one which seeks to sustain the status quo through the adoption of progressively exploitative practices at a global scale. This is not sustainable. The institutions and values which legitimate this process are the basis of unsustainability. Changing these is *sine qua non* of a more sustainable future. The radical nature of this agenda may well be the real sustainability impasse.

10.4 **Beyond the impasse?**

The aim of this thesis has been to progress the theory and practice of sustainable development. The need to transcend the limitations and inadequacies of established approaches is hardly in doubt. In particular, the necessity of moving beyond understanding unsustainable events as discrete and unembedded occurrences and attempting to address them as such is clear enough. This thesis has attempted to move beyond the current impasse by reconsidering sustainability issues within a realist ontological and epistemological framework using theoretical constructs derived from regulation theory. The results of the research have not invalidated the theoretical potential of this approach. Rather, they have substantiated the model linking the dynamics of capitalist accumulation and unsustainable outcomes developed in chapter 3 of this thesis. However, the fact that sustainability debates might be usefully informed by a closer engagement with social theory was never in doubt. The real tests are not whether such engagement can inform policy, but whether social theory needs to be or can be modified in the light of sustainability concerns. Indeed the problem for this

project was not so much linking the dynamics of capitalist accumulation systems with a range of increasingly exploitative practices. Rather, the principal difficulty lay in testing and refining this model.

This was always likely to be problematic as the established methodology for 'putting realism into practice' is hardly straightforward. Realist methodology is difficult to articulate in practice, not least, because actual events often reflect complex patterns of causality involving a range of contingent factors, plural mechanisms and factors which influence the ways in which mechanisms are or are not activated. Moreover, in practice, it is clear enough that objects and structures other than those considered in this analysis may well have significant causal powers and a more convincing and powerful model might well have included these more fully than was the case here. That said, what was sought here was 'practical adequacy' rather than any totally complete truth. Thus, two key questions arise. First, is the model developed within the thesis convincing in that it remains theoretically and empirically sound? And second, is it practically adequate in the sense that it can provide the basis of a productive and useful approach to sustainable development?

Established realist methodology suggests that an initial 'model' developed around theoretical constructs and actual events is refined through a reflexive process of testing, substantiation and modification. The original model used here was constructed largely around theoretical categories defined by regulation theory. The case studies explored in this project appear to support the general regulationist interpretation of capitalism as an inherently crisis prone and transformational process within which accumulation systems are necessarily sustained through modes of social regulation. It should be recognised, however, that many of the theoretical constructs employed here are some way removed from the central tenets of established regulationist thinking. In particular, an attempt has been made to extend key regulationist concepts which are usually applied at a macro scale to individual sectors. The problem here is that regulationist analysis is usually concerned with a unity which necessarily extends beyond any individual sector. Although it might well be argued therefore that it is inappropriate to apply the precepts of regulation theory to the small scale and the unique, this does not undermine the validity of the approach adopted here. Certainly, the established socio-economic formations in both case study locations appear to tend to be unsustainable because increasingly profound contradictions keep emerging. In themselves, these might not be the same macro scale sources of

dysfunction on which most regulationist analysis has focused, but they are surely reflections of these.

The analysis also supported the conceptual model in that relationships were established between the capitalist dynamic and what by any reasonable definition would constitute unsustainable practices and events. In both the case studies significant relationships and causal mechanisms were identified. The inherent 'unsustainability' of established capital and class structures in both Barbados and Australia was postponed, but only through recourse to ever more profound forms of exploitation. In practice, environmental and human resources have been degraded while established capitals and patterns of social relations have been reproduced. And in both the case studies, the prevailing modes of social regulation have ascribed priority and flexibility to mechanisms which preserved the value of capital and protected established patterns of social relations whilst marginalising and devaluing environmental and moral components of development.

The notions of 'formational' and 'material' sustainability employed throughout this analysis retain some analytical utility. Certainly these conceptual categories can be applied relatively convincingly in the case studies. More significant than these, however, are the related contentions that sustainability can most usefully be conceived of in terms of equilibrium and that it is most properly understood as a condition rather than some quantifiable demarcation of the nature-society relationship. For the most part, the analysis of the case studies also confirms the relevance and probity of these conceptual categories. The case studies support the contention that current modes of social regulation tend to condition development in ways which make unsustainable outcomes the norm. Thus the analysis here also supports the view that potential for positive change lies in understanding how this conditioning might be objectively changed, and that the methodology employed here can take thinking on sustainability beyond vague and unembedded notions of institutional and value change in society; allowing a more objective determination of just which institutions and values need to change and what form these changes need to take.

This research has just begun to clarify how the specifically realist notion of mechanisms being 'activated' can form the basis of a new approach to sustainable development. In Barbados, the strategies pursued by the 'plantocracy' would not have been effective if they had not been legitimated

and empowered by a particular set of institutions and social values. In Australia, neither the whole emphasis on modernisation nor the current de-regulatory programme could have been enacted without a mode of social regulation which legitimated these actions. In both of these cases it seems to be clear enough that the prevailing modes of social regulation have conditioned the nature of development.

The deregulatory programme in the Australian sugar sector and the liberalisation of financial regulation in Barbados are interesting not simply in their own right, but also because they mirror wider trends in a situation where increasingly neo-liberal agendas have gained prominence throughout the world. This raises the important question of whether the general conclusions reached from the analysis of the case studies embody any wider significance. There is no evident reason to suppose that there is anything singular about the sugar sector which should restrict the relevance of any conclusions reached here. Certainly this sector has particular characteristics as do both of the case study locations, but both the sugar sector and the locations studied are far from unique. The fortunes of both are tied directly to the global sugar economy and whilst actual outcomes may vary from place to place, many of the processes and mechanisms which affect these locations are the same as those which affect sugar producers throughout the world. Equally, whilst much has been written concerning those characteristics of agriculture which differentiate it from other forms of capitalist production, these do not preclude a more general applicability for the analysis here, particularly as sugar production is, in any case, an agro-industrial process. Beyond these points, there also appears to be abundant evidence to support the wider applicability of the general conclusions reached in this thesis. Particular socio-economic formations in other sectors and locations appear to be crisis prone and temporary - certainly there is little evidence that any have been sustained indefinitely. Equally, the suggestion that the emergence of contradiction is normally addressed through essentially conservative strategies and that these tend to involve materially and morally unsustainable outcomes can be easily and convincingly transposed to other situations.

More generally, understanding unsustainable development simply in terms of the theoretical categories related to purely capitalist structures clearly paints an incomplete picture. However, it may well be that such categories are pervasive and profound enough to have a very broad relevance. Understanding the relationship between capitalist dynamics and unsustainable outcomes

may provide a practically adequate explanation of why development tends to be conditioned to the unsustainable. Understanding how and to what extent this relationship might be modified by purposive social action may well be the key to overcoming the sustainability impasse.

This thesis has begun to explore how social theory can provide a conceptual framework and methodology which are relevant and useful to the achievement of sustainable development. It has begun to consider how development is often effectively conditioned to the unsustainable and how this conditioning might be reversed. Clearly, much work still remains to be done. The analysis here has identified what some of the key causal mechanisms in the two case studies - the mobility of capital in Barbados, and modernisation and debt in Australia. It has also identified a key significance in the particular conditions which activate and empower the mechanisms allowing 'unsustainable' outcomes to be realised. In both of these cases an increasingly neo-liberal bias within the modes of social regulation appears to have been crucial in conditioning development towards the unsustainable. This provides a general commentary on neo-liberal approaches to sustainable development, but if this critique is to be translated into positive action, the conclusions reached in this thesis need to be further tested and refined.

The model developed here needs to be applied in other locations and in other sectors in order that a clearer notion of just what conditions are important and just how they affect development can be constructed. Equally importantly, further consideration needs to be given to what modifications are appropriate and possible. The analysis here suggests that modes of social regulation need to be reconstructed in ways which reverse the priority and flexibility currently accorded to mechanisms which preserve the value of capital and the preservation of extant patterns of social relations. Indeed the apparent conclusion is that modes of social regulation should encourage the devalorisation of capital and fixed assets. Whilst it clearly is the case that the potential for effective agency is limited in the sense that new modes of social regulation cannot be constructed as valid wholes, purposive modifications might still be possible. If we accept that increasingly neo-liberal political agendas in both Barbados and Australia have served to condition the actuality of development in particular ways, we must surely also accept that different political agendas might produce different and more desirable outcomes. This conclusion needs more comparable research to establish precisely how this might be achieved. For example, although inflation has for some time been a

central concern of some regulationist schools (Jessop, 1990) the links between this mechanism and sustainability issues have not been adequately explored. The tentative conclusions of this research would suggest that in so much as this mechanism does serve to devalue existing capitals and class structures, economic policies which are fundamentally concerned to control inflation may well be quite damaging from a sustainability perspective. Consideration also needs to be given to just how radical and politically inexpedient such an agenda would be, and to whether it would in practice be too radical to have any realistic chance of being put in place given the current pervasiveness of neo-liberal ideologies and related modes of social regulation. Related to this, questions regarding the territoriality of regulatory modes, especially at the state level, needs to be further explored in relation to sustainability concerns. And this, in turn, posits key questions about the extent to which modes of social regulation depend on social practices which are not constituted through the state. A modified realist mode of explanation and the sort of methodology applied in this thesis can allow progress to be made in answering these questions.

Further engagement with social theory is the one agenda which will allow both the theory and practice of sustainable development to be progressed. The way ahead will clearly be difficult and it would be quite unrealistic to believe that simple and incontestable strategies for a more sustainable future will emerge quickly or easily. The analysis here has been embryonic and is certainly incomplete, but it has begun to chart a path beyond the sustainability impasse, and it has elucidated a methodology which might be used to further explore this new path.

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