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Potential contribution of empirical research towards integrated landuse planning to mitigate deforestation in Zimbabwe's land reform process.

By

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Dedication

To the love of my life **Miracle** and the fruit of our love **Anoshamisa**.
Few have given up so much.
So that those they love.
Can fulfil their dreams.
All, so that in the end they all enjoy so much joy and abundant love
I love you always
My love
My wife
My friend

The Wisdom

"We have found the enemy and the enemy is us" (Senge, P.M.1990, page 54).

"An ounce of prevention is worth a pound of cure" (Gardner T.G. et al 1996, page 263).

"If we cant convince you by our arguments then why not just join the race to save our planet simply for the sake of the thin atmosphere, the life sustaining envelope that distinguishes earth from the other dead planets and gives us the privilege to breathe" (Clive 2002).

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I am indebted to the Swedish Institute who by believing in my potential financed the whole dream and where it not for there support this dream would have remained just that, a dream. Tack tack.

My deeply felt warm and tender gratitude to my loving wife **Miracle** and our adorable bundle of joy **Anoshamisa**. You believed in me all the way and supported me despite the tough times of loneliness. I will never forget the sacrifice you made and will love you more for the patience and faithfulness you showed. I love you. To both our parents I say thanks for believing in the dream and for the love of parenthood.

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Last but most importantly I want to thank my Lord who planned it all to begin and end in this way. Jeremiah 29 vs. 11 " **For surely I know the plans I have for you, says the lord, plans for your welfare and not for harm, to give you a future with hope**."

Abstract

Whilst the international community ponders on the future impact of the current fast track land reform in Zimbabwe they may be missing the immediate potential threat to forest resources as land has been mainly distributed for agricultural purposes. This paper explores the idea that to mitigate this impact there is need for integrated landuse planning and argues that the path to such planning can be aided by use of results from empirical research carried out in established first phase resettlements. The analysis demonstrates that research findings by shading light to the forest resource use dynamics, not only allow for more informed contingency planning and better design of monitoring strategies, but also underscores the need for a participatory planning approach so as to pick on and facilitate local innovations towards mitigating deforestation. The results of the analysis are also used to assess the potential of the government proposed Integrated Conservation Plan for the Fast Track Land Reform 2001-2, to meet its objectives. The conclusion is that most of the strategies in the proposal have the right approach but there is urgent need to adjust them in line with the forest resource dynamics in the field, short of which they might fail to realise significant sustainable resource management.

Keywords: Integrated landuse planning, Participatory planning, Fuelwood, Land reform, contingency plans.

Chapter 1: Introduction

1.1: The country

Zimbabwe is a beautiful land locked country in southern Africa sharing borders with Mozambique, Zambia, Botswana and South Africa, Map 1. It has a population of 12 million and land area of 390, 757 km^2 with 53% of the land area being under woodland and 12.7% under bushlands (Nhira et al 1998). The country has been under British rule since 1890, becoming independent in 1980 after liberation war fuelled by the desire for land for the black majority.

Map 1: Zimbabwe location

1.2: Problem definition

In the vein of most former colonies like Kenya and Tanzania, post independence Zimbabwe embarked on land reform programmes whose main objective has been to ensure equitable distribution of land. In Zimbabwe's case the target at independence in 1980 was stated as being to settle 162 000 households on 8.3 million hectares within 5years (Chenje et al 1998, Moyo 1995). In light of the concept of sustainability, which hails equity, the gesture is commendable but it is in the realisation of the potential impact of such an undertaking on the land resources that its planning and subsequent implementation requires thorough analysis. The key question becomes "what aspects of the natural resources are going to be integrated into the decision framework which is primarily concerned with land redistribution?" This becomes critical when we note that some decisions may be pivotal to whether resources are available to future generations and that *"Land degradation has been exacerbated where there has been an absence of land use planning, or of its orderly execution, or the existence of financial or legal incentives that have led to the wrong land use decisions, or one sided central planning leading to over utilisation of the land resources"* (FAO 1995, chapter 2). Thus there is potential that Land reform may lead to either sustainable or unsustainable resource management, with the planning process contributing significantly to the eventual outcome.

Is their need to be concerned in the case of Zimbabwe? Official figures for Zimbabwe peg the deforestation rate at 0.4% per annum, (CSO 2000), higher than the 1990-5 average figure for the

world at 0.3% (FAO 2000). A greater proportion of this deforestation has been unequivocally attributed to land clearance for agriculture purposes (Chenje et al 1998,Elliott and Campbell 2002, Leach et al 1998, Nhira et al 1998). Incidentally land reform, in the Zimbabwean context, endeavours to redistribute land for this very purpose, agriculture. Worrying is that these developments are in the backdrop of such observations as "*agriculture has clear national priority over forestry, and over other (overlapping) land uses, notably wildlife* (Nhira et al 1998, page 37), "*landuse planning is carried out by the ministry of lands and Agriculture to the detriment of other land uses* (Chenje et al 1998, page 196), and "*despite being highly valued by local people for both economic and social reasons, woodlands are ranked lower in importance by local farmers than agricultural land*" (Goebel et al 2000, page 385). What more in those earlier resettlements, products of the land reform process, there has already been concerns over the continued depletion of wood resources (Nhira et al 1998, Chenje et al 1998).

What inspired this paper is the possibility that planning, in Zimbabwe's case, may again allow agricultural land dominance to persist whilst forests deplete. Thus this is part of the wake up call, also strongly championed by FAO (FAO 1993,2000), for forest planning to be integrated into the wider context of landuse planning so as to mitigate deforestation. It is the argument of this analyses that if the forest resource use dynamics in resettlement areas are understood it may assist in identifying where and how to intervene. It is further argued that much of this process will be greatly assisted by using a systems thinking whilst looking to local research data for guidance to locally viable integrated and holistic planning.

1.3: Objectives

The first objective is to show that local research data may aid in the identification of the forest-land-people dynamics, which can be of assistance towards formulating monitoring strategies and integrated planning to mitigate deforestation. The second objective is to use the data synthesized from the analysis as a reference for assessing whether the integrated conservation plan proposed by the government of Zimbabwe in 2001 for its Fast Track Land Reform process is likely to meet the need to mitigate deforestation and ensure sustainable land resource management.

1.4: Scope and limitations

The scope of the paper will be limited to an analysis of the forest resource-people-land and planning dynamics in resettlement areas. Emphasis will dwell on how understanding the forest resource use dynamics will contribute to the physical national landuse planning process, being the one that relates to studies and policies aimed at deciding what type of landuse activity should take place and where. The main focus will be the integration of forest resources into landuse planning. The main limitation is the unavailability of recent data on land reform monitoring in Zimbabwe, which has considered the impact on the environment especially forests, and also the lack of studies that have looked at the effect of non-integration of forestry into land reforms. The findings from just two schemes may not depict the dynamics of all resettlement schemes due to diversity of local conditions and values, which further underscores the argument that there is need for this kind of research on all schemes.

For this paper **land reform** (**resettlement** in local terms) will refer to the land redistribution process as is ongoing in Zimbabwe where the indigenous population mainly in **communal areas (formerly**

native reserves), is given access to land that has been in the hands of the predominantly white Commercial farmers, descendants of the colonial settlers.

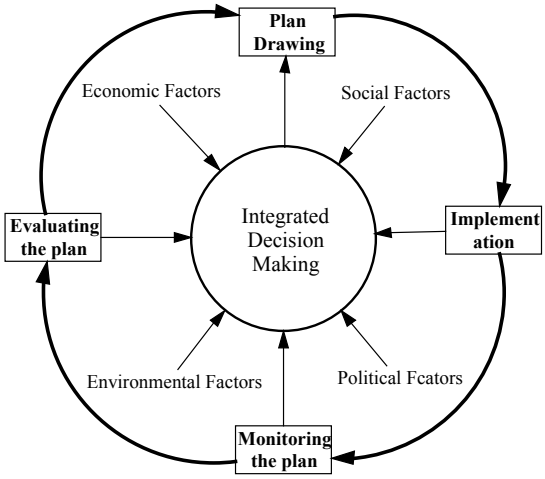
1.5: Material and Methodology

The methodology used in this thesis involves literature review to give a theoretical background supportive of integrated landuse planning. Much of that literature, specifically pertaining to land use planning, is mainly sourced from FAO sources that have the latest accessible and comprehensive data on the subject matter.

Since there has been very little recent research into the Zimbabwe resettlement process that has incorporated environmental aspect, an excerpt of Case study data from a research carried out in 1993 by Dr J Elliott (Brighton University UK) and the author is instead used to illustrate the potential contribution of research data to understanding the dynamics of forest resource use in resettlements and eventually towards formulating integrated landuse plans and monitoring. A tabulated summary of the Integrated Conservation Plan for Fast Track Land Reform proposed by the government in 2001 was prepared directly from the official government publication (GOZ). The findings from the two case studies outlined above are presented in Chapter 3 with their analysis being offered in Chapter 4.

The whole methodology is adopted so as to fit in with the elements of planning depicted in Control Loop approach depicted in Figure 1. The modified conventional control loop shows how plan drawing follows an integrated decision making process with contribution from social, economic and environmental aspects of resource use, a process argued in this paper to be aided by empirical research. The plan drawing stage is then a reflection of the trade off agreed upon by all stakeholders with the final goal being an integrated landuse plan capable of meeting sustainable goals.

Figure 1**:** Control Loop



Source 1: Adapted and modified from Smith 1996.

Chapter 2: Theoretical framework.

2.1: Planning defined

Landuse planning is a systematic approach to assessing the potential of given land resources and the search for the ***best alternative use*** of each land unit with the intention being to meet present and future generations requirements, adopting sustainable options, and adapting to changing scenarios as presented by past experience (Van Lier 1998, FAO 1993). The final product would be plans whose purpose is to help organisations (governments and communities included*)* to

- Define their future direction
- Decide how they are going to achieve their goals
- Monitor their progress towards their goals

Whilst they also help individuals to:

- Understand the objectives of the organization
- Understand how they can contribute to achieving specified goals
- Ensure that they align their efforts with people in other teams or departments (Smith 1996).

What this definition does is highlight the significance of a plan as a guiding/reference tool and its applicability at various societal hierarchies. It also shows that the process requires the participation of decision makers, they be organisations or individuals. In other words landuse planning is a decision making process not decision adoption process, as most conventional top down planning tend to do. What it does not show however is that they are different types of plans, dependent on the ultimate objective of the executing authority and that there is considerable interaction between the individual and the organisation. It is for the former reason that it is vital to understand: the purpose for which a plan was devised, the by whom and for whom question, and under what terms of reference.

2.2: Contingency planning

Contingency plans are made to address those major factors likely to jeopardize an organisation and achievement of its long-term success (Smith 1996). They are there to counter uncertainty in dynamic systems introduced by the high frequency of unforeseen events. In the case of forests and land reform responsible authorities may be interested in the likely impact of resettled people on a given forest resource base and may also speculate on possible impact of unplanned settlements (migration/squatters). All such factors may be useful for scenario building and predictive forecasting exercises. A powerful tool to aid predictive forecasting and contingent planning is research using reliable information sources (Smith 1996), which, for the case of resettlements may involve study of earlier schemes planned by either colonial or the independent government authority. As an example maybe the case of a colony whose masters prepare landuse plans on behalf of those subject to them. For whose benefit is the plan structured, who is consulted, and whether natural resources are sustainably exploited may depend, among other things, on the time frame the colonial power intends to stay and the resistance of the locals. For instance with a short stay plunder and loot may prevail whilst a longer stay may entail investment into conservation measures, probably negotiated or imposed. A short stay and non-consultation may also lead to an ad hoc approach whereby each event is dealt with as it occurs. This approach is reactive to crises instead of being preventative and incidentally Miller has even suggested that it is also characteristic of most democratic governments (Miller 2000). Miller's main argument for this suggestion is that preventative approach in calling for a long-term (holistic) approach tends to unnerve the governments, as they may have to introduce radical changes that may have the society, on whose votes they depend, resistive. If then this approach is common of both dictatorship and democratic

governments it may spell disaster for natural resources, as some damage is not reversible, at least to original state, e.g. with forest ecosystems. The alternative approach would ideally be a planned one in which contingencies are anticipated and properly planned for. In their lies the power of planning for it creates a longer term balancing process.

2.3: Participatory planning

Participation of all stakeholders including local communities in decision-making process is a key element of Agenda 21 and should be a right, in contrast to privilege, when considering landuse changes. The true implication of the process is embodied in this definition of the word: "*participation is a process through which stakeholders influence and share control over development initiatives and the decisions and resources which affect them"* (World Bank). This is particularly important for rural communities in developing countries for whom the land resources constitute a key contributor to their livelihood. Moreover their participation allows for analyses of their quality of life, priorities, constraints and opportunities. Furthermore "*it also provides concrete information on risk and vulnerability that is absent from much of the data on which conventional policy is based*" (Tikare et al 2001, page16). Participation also enables resource pooling from those people directly affected by policies and increases commitment, just as it does to job satisfaction in the business world. It also allows for local initiatives to be considered, giving legitimacy to the final implementation. If we accept that the planning process begins with identification of a problem (FAO 1993, 1995), then we may rightly suggest that locals are better placed to contextually identify the problem and suggest possible solutions meeting their local specific goals. For forests this takes greater significance for as Marcoux observes, "*the issue of deforestation is highly location specific*" (Marcoux 2000). Notwithstanding that, forest sectors often get excluded from the central landuse planning process, as they have tended to develop in isolation (FAO 1995). Such an approach is non systemic and is inherently limiting for problem solving for not all the contributing factors will be considered. What we end up with usually is a shift of the problem from one part of the system to the other. The dilemma then is that those who respond to the problem by shifting it never get to learn the right response for they do not get to directly experience the negative impacts of their actions.

On the other hand participation, like sustainability, has become quite a catch phrase thus, is liable to abuse in the pursuit of hidden agendas by planning authorities. To begin with participation should stem from shared not dictated visions and how best to promote this than through facilitation of dialogue between the interested parties. The significance of participation has been alluded to by Leach et al when they suggested that the fact that people are not planting trees may not necessary mean they do not value them instead they may have more pressing needs like food security. To realise this, they conclude, one has to understand local rankings and prioritisation of needs, something dialogue may enable (Leach et al 1998). Furthermore allowing dialogue builds trust, which is of paramount importance for building commitment bridges in those situations where local communities have relic "government mistrust syndrome" symptomatic of colonial days. Interestingly the traditional approach by governments is command and control, which results not in commitment but compliance and tends to sow seeds of future resentment. To be fair on governments sometimes their approach is justified in that, empowering people e.g. by participation, when they have no shared vision or common mental models, may actually be counterproductive for administration purposes as it becomes difficult to maintain coherence and direction. Conversely only by facilitating participation and allowing for genuine dialogue (reflective openness) can it become possible to understand the people's position so the dictatorship approach can not be justified in this way. Viewed from another angle it appears there might actually be a bonus accruing

to the government that pursues a participatory process as Tikare has observed that "*governments that inform a wide range of stakeholders as early as possible about the process and content of their policy-making and implementation tend to have greater credibility with their constituencies*" (Tikare et al 2001, page 10). We may sum up the benefit of participative approach by the suggesting that a problem is more likely to be solved when most decision makers are involved and all working towards a common goal.

2.4: Matching land potential to use

Landuse planning's process must objectively reflect the local circumstances and realities especially since each locality is unique, not least due to its climate and physiognomy but also because of the evolution of its socio-economic setting (Tikare et al 2001). How can one know these conditions? The country's resource database is critical in this exercise so is information gained by research/monitoring on earlier projects and gathered from locals, assuming a participatory approach is adopted. An alternative approach suggested by FAO is simultaneous resource surveys and studies of land use types with regular interchanges of information (FAO 1993). To understand the local aspect of conditions is essential since local conditions are very diverse such that each plan has to be unique for it is prepared for a particular location in time and space. For clarity one may borrow the notion of prototypes from the field of business management. These are viewed as the necessary transitional phase between an idea and its full and successful implementation. Their importance is in that even though most may fail it is from these that most is learned (Senge 1990). For the purpose of landuse planning prototypes can be either previous small-scale projects, in area of interest, on which monitoring has been undertaken or deliberate small-scale undertakings for the sole purpose of learning. This approach's aim is to ensure that ground conditions and activity match the final proposed plan something computer modelling wont show. In their argument against computer modelled landuse planning Kutter et al have even suggested that this "on the ground" approach will help planners to understand why their optimal landuse may not be what the users choose in the end (Kutter et al 1997). Furthermore Prototypes appear to be consistent with the FAO idea of incremental planning which entails making small local changes, the idea being that problematic solutions are identified earlier (FAO 1993). Interestingly the "local is best" or "bottom-up approach" concepts may tie in well with the idea of prototypes as locals tend to understand local conditions better and their sustainable resource use innovations can serve as starting points.

2.5: Population density and resources

Any settlers will require resources which in turn are naturally constrained hence there is need to match, to every extent possible, the population to the existing resources. This is particularly vital for forests for which the impact of population growth is direct as fuelwood demand is in general proportional to population size (Marcoux 2000). Failure to do so may lead to such incidents as that of the deforestation experienced in Ethiopia that has been partly attributed to the search for remaining fertile pockets of land in a densely populated area (Sanchez et al 1997). Additionally forests become more vulnerable in that, especially in developing countries, they not only supply firewood but construction and artefact material. Ultimately whether there is sustainable utilisation or not may depend on the critical population size of the settlers, which will not only have natural increment but also grows due to illegal migration.

Illegal migration of settlers into legitimately established resettlement areas poses greater threat to the success of land reform programmes and to sustainable management of forest resources. The

reason is that migration besides occurring faster than other demographic factors also tends to target forest areas and brings in active adults (Marcoux 2000). These adults besides having no local knowledge of the area tend to have a little or no invested interest in the sustainability of the resources for they are prepared to pack it in and go when the resources are degraded. On the other hand there is need to recognise the possibility of in migration being a source of new skills and technology to actually mitigate deforestation. Notwithstanding the latter the continued filtering in of settlers beyond the planned figures strains the local resources hence there is need to put in control and monitor mechanisms for illegal settlers and the need to have accurate data on the numbers settled legally. Short of this the government may be forced to legitimise the illegal settlers as happened in the Kenyan experience (Bradley 1991) defeating the whole purpose of the initial land reform programme. The settled people may need legal tenure to begin with so that they are legally empowered to enforce their property rights and exclude the illegal settlers.

2.6: Tenure

The lack of legally recognised tenurial rights over resources e.g. land, has been cited as conducive to resource degradation as people do not feel incentivised to conserve them. The same argument has been used to explain the destruction of tropical forests. The claim being forest dwellers that lack secure tenure revert to short term profit maximisation (Ghimire et al 1997). On the other hand it is deemed that "*clarification and security of land rights are essential for the success of an integrated approach to the planning and management of land resources*" (FAO 1995, chapter 3). Additionally Leach asserts that this is particularly true for the rural poor and for those resources whose benefits is long term, such as many forms of tree growing (Leach et al 1988). Incidentally just the prospect of change alone may introduce enough uncertainty to inhibit investment in tree growing. This is more so in a climate of political and policy experimentation as is typical of new governments in former colonies.

Furthermore tenure over forest resources may also be a source of deprivation for some individuals who despite neighbouring sufficient wood resources are refused access due to private tenure arrangement. Conversely the same arrangement acts as a powerful incentive to conserve and also exclude outsiders. It should be clarified that private tenure does not exclusively refer to tenure awarded to an individual instead it also applies to groups e.g. villagers (see Gibson et al 2000, for more).

It is not enough to be aware of tenures operating over the forests of a country but there is added need to ascertain how property owners exercise their property rights. This is important since some owners are known to grant access and use rights to third parties (White et al 2002). This practise distorts the statistics of harvesting and gives a false sense of sustainability especially where demand is calculated only on the basis of whom has legal rights to what forest resource.

2.8: Mental Models

It would be incomplete if we do not consider the contribution of mental models of the respective individuals and organisations, to the achievement of goals set out in plans. One argues so in the realisation, that mental models are the mind frames through which we view the world and ultimately take action (Senge, 1990). It is this framework, which, for instance, leads one farmer to clear-cut in a new farm whilst another chooses to leave some trees in the field. To a non farmer the clear cut decision might seem irrational till one understands that the farmer is working within the economic paradigm of profit maximisation wherein trees, as understood by his mental model, may mean less area for crops and competition for nutrients hence less yields. This phenomenon may be

classified under the short term planning approach, which is fuelled by the prospect of immediate benefits and hence contrasts with the long term planning approach in which the satisfaction of both immediate and future benefits, in other words sustainability, is the goal.

Mental models go even deeper in that they have the potential to limit implementation of new visions and ideas for they are associated with the notion that what is familiar has less risk, (Senge 1990, Gardner et al 1996). One may take the case of villagers who have always clear-cut their fields and are resettled and encouraged to do otherwise, more chances are they will stick to the old ways, which unfortunately may mean more deforestation. Senge accounts for this behaviour by suggesting that
"New *insight fail to get put into practise because they conflict with deeply held internal images that limit us to familiar ways of thinking and acting*" (Senge 1990, page 174). The same concept has been used by Guerin to account for why sustainable solutions introduced through extension officers are not usually adopted. His argument stresses that there is need to understand the attitude of the client and the learning style of both the advisor and the client failure of which a conflict of interest scenario develops and the client tends to favour the older and trusted ways (Guerin 2001). With such complex dynamics in adoption of new ideas it therefore, becomes imperative that the mental models of those being moved about in land reform undertakings are taken into consideration.

Chapter 3: Case Studies

3.1: Background to case studies

The case study data presented in this paper has one thing in common, a link to the issue of land, which has been an emotive political and social matter since the 1890 colonial occupation by Britain, which led to the dispossession of locals of their land, and access to resources. Much of the dispossession was to make way for commercial farms and national parks and reserved forests. The displaced peasants were settled in native reserves (**now communal areas**) whose administration was separate from that of commercial farm areas settled by the white settlers (Moyo 1995). The set up was such that by 1980 the less than 7000 white commercial farmers had access to 47% of the arable land in the country whilst the 700 000 African farmers resident in the communal had access to only 40% of the arable land with most of it in marginal areas (Elliott 1995).

This inequality in land distribution and access to land resources has been argued as the cause of much resource degradation in the communal areas (Nhira et al 1998, Chenje et al 1998, Moyo et al 1995). The main argument hinges on the claim that by creating high population density in mostly marginal areas a vicious cycle of resource degradation was initiated (see Figure 2). Now since independence in 1980, as shown by the thick arrows in Figure 2**,** there is deemed need for land use change, which has been done in the form of a series of comprehensive land reform or land redistribution processes.

Additionally this time instead of native reserves, settlements termed resettlement schemes have been created with land being acquired on willing buyer-willing seller terms prior to 1992 after which the government tabled the Land Acquisition Bill. This allows the government to designate land for resettlement purpose, decide on a price for improvements made on the farm with or without consent of the farmer. The slow pace of the past land reforms has led to the adoption of the Fast

Track Land Reform as of 2001. This development is also in the wake of "illegal" land invasions/occupations initiated by war veterans and land hungry communal farmers in 2000 (Harts-Brokhuis et al 2001), which have led to an international outcry of lawlessness and concern for the impact on the economy, society and environment. Ironically Svosve village where the very first cases of occupation occurred borders the case study Wenimbi –Macheke.

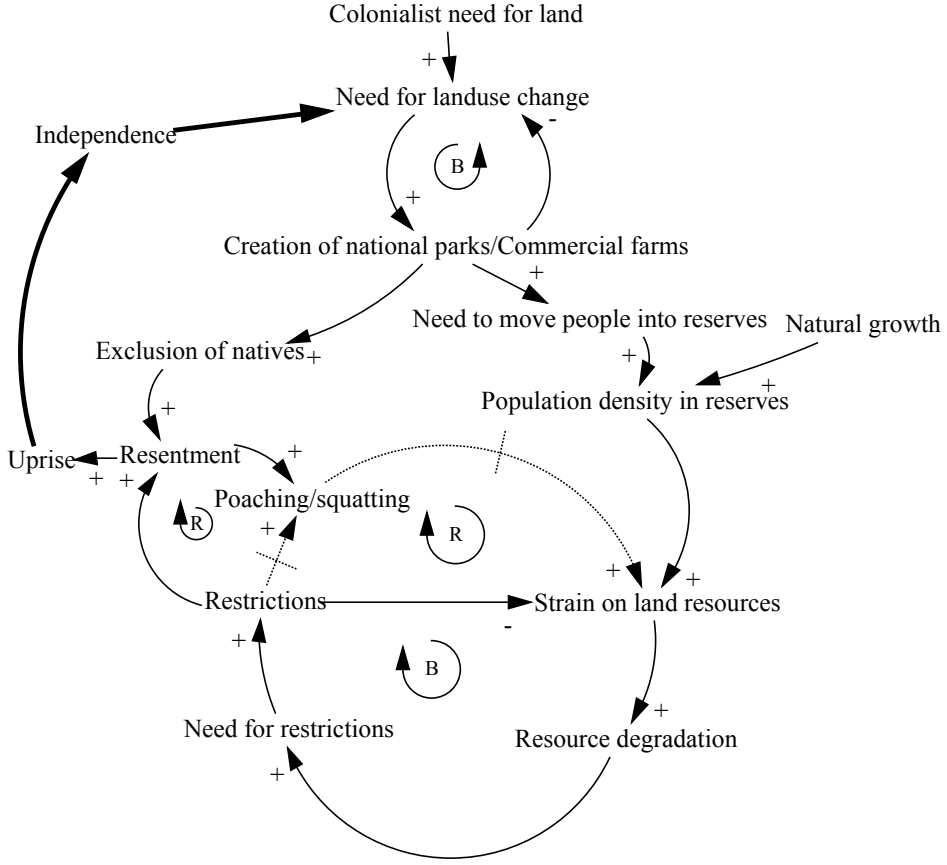


Figure 2: CLD showing the link between landuse change and resource degradation in colonial era

Explanation of the dynamics

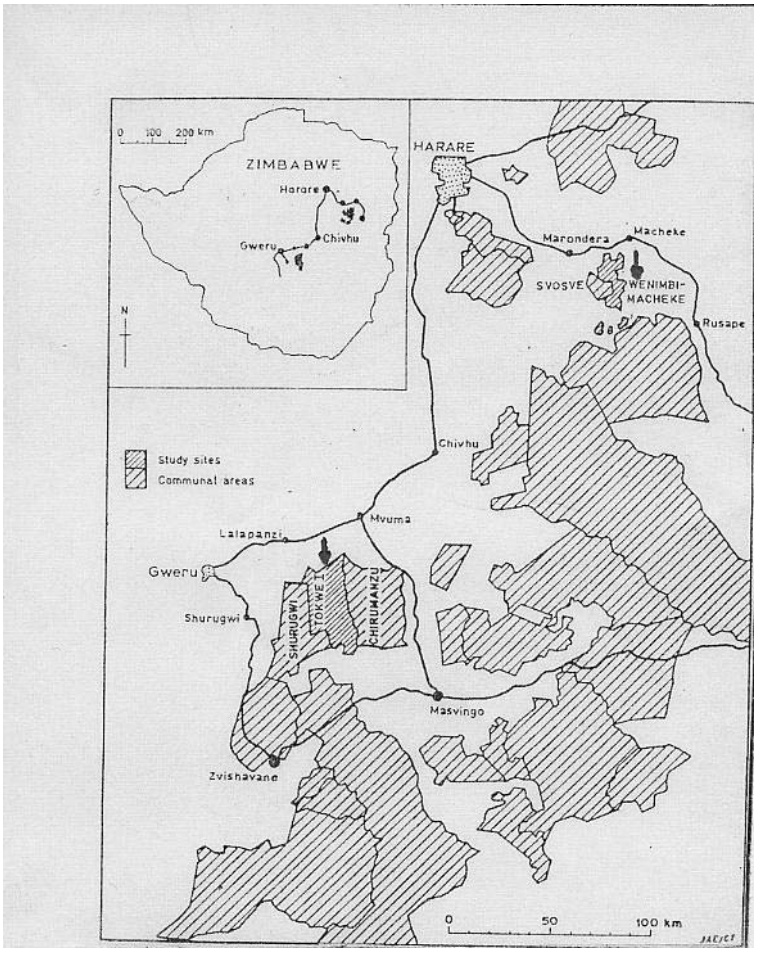
The colonists required land for farming, settlement and mining, which drove the need for a land use change (planning), which increased (+) the creation of national parks and commercial farms. This set up satisfied the planning objectives of the colonists as there was reduced need (-) for more land use change (balanced the system). But as with all systems the exogenic linkage fuelled (+) another subsystem (degradation system) driven by the exclusion (from national park resources) factor and high population density (+) created in the native reserves by an increased (+) inflow of displaced people and natural growth. The high population density increased (+) the strain on resources, which in turn increased (+) resource degradation. The latter increased (+) the need for restrictions on resource use, which in turn saw more (+) restrictions being imposed, and in the short term the system was balanced, as strain on the resources would have been reduced (-). Unfortunately the restrictions increased (+) the incidence of poaching, directly and indirectly via more resentment, which via a delayed reinforcing loop inevitably increased (+) strain on the resources again and the vicious cycle of degradation continued. The thick arrows represent how the country has come to the current situation where there again is deemed a need for land use change under a different political regime brought in by means of liberation war. The critical question is whether current landuse planning is gong to again make the same mistake as in the past.

3.2: Empirical evidence from two resettlement schemes

This survey was carried out in 1993, 13years from the onset of the land reform programme, and stands out as one of the very few to have considered the impact of resettlement on forest resources, at least in a significant way. Some of its objectives, relevant to this analysis, were

- To identify the nature and extent of woodland management activities at the individual and community level
- To identify perceptions of human-environment relations and ecological change in resettlement areas
- To identify the nature and extent of contacts between resettled households and those of neighbouring communal areas

One case study, Tokwe scheme is located in the Shurugwi Rural District council and mostly falls in agroecological zone known as natural region 3 with the southern portion being in Natural region 4. Region 3 is mainly suited to drought resistant crops whilst Region 4 is unsuitable for dryland cropping but fine for livestock production. The other scheme, Wenimbi-Macheke is located in the Marondera Rural District Council and lies in Natural Region 2b, which is suited to intensive livestock and crop production (see Map 2).



Map 2: Resettlement study sites, Tokwe and Wenimbi-Macheke, and their surrounding communal areas

3.2.1: Methodology

The first step was to randomly select villages and then interviews conducted with representatives of all households in each selected village. For the Tokwe scheme 224 households in 8 villages, 22% sample of total villages in scheme, were interviewed. In the Wenimbi-Macheke scheme 8 villages were selected on the basis of time in operation (older villages being selected) and out of those 215 households, 20% sample of households in scheme, were interviewed. Though the questionnaires (appended) were in English the interviews were carried out in the vernacular language by a selection of University of Zimbabwe geography students in January 1993. Each interview contained a number of open and closed questions covering socio-economic details of the household, the use, collection and management of woodland resources and change therein since resettlement and regarding the nature and extent of contact with the neighbouring communal area. Some of the findings sampled for their relevance to the argument presented in this analysis are presented below with the analysis of their implications being presented in Chapter 4.

3.3: Results

3.3.1: Change in wood use pattern

Wood is the sole fuel source for cooking and heating in the resettlement areas with significant changes noted not in the fuel source but in the level of participation and the frequency of wood-using activities, see Table 1.

Table 1: Percentage of respondents participating in wood-using activities. (NOW-in the resettlement scheme: CA-Communal Area).

Scheme	Brewing		Brick Making	
	Now	CA	Now	CA
Tokwe	86	85	93	81
Wenimbi-Macheke	34	49	85	65

There has been a significant increase in brick making in the two areas whilst the increase for beer brewing appears to be more significant for Wenimbi-Macheke with 15% decrease compared to Tokwe with a 1% increase. Further questions were directed at finding out the reasons for change (See Table 2) in the amount of wood used among those respondents who had indicated this change.

Table 2: Reasons for change in quantity of wood used (percentage of those expressing a change).

Reason	Activity			
	Cooking	Brewing	Brick Making	Average
Improved supply leading To increased amount used	57	68	49	58
Improved species leading to Using less wood	1	3	-	2
Improved form of logs leading to Less used	20	28	27	25
Restrictions on cutting leading to Using less	-	-	1	1
Changes in household composition Leading to more wood being used	22	1	3	13

Baking more bricks on each firing Leading to more wood being used	-	-	20	20

Improved supply as reason leading to more usage of wood was cited on average 58% whilst a converse scenario of improved form of logs as reason for less wood usage was cited on average 25%. The tendency to use more wood because of increased supply is more noticeable in the case of beer brewing. Cooking is likely to have greater impact on the sustainability of the wood supply especially when it is linked to the change in household composition that tended to become larger in resettlement areas.

3.3.2: Species use

In total for all the wood using activities studied it was found out that 45 species were utilised with the general trend being a reduction in the number used in resettlement area compared to communal area as shown in Table 3.

Table 3: Number of species identified as major wood source for activities combined

Scheme	Species Number	
	Now	CA
Tokwe	18	34
Wenimbi-Macheke	13	19
Total Sample	20	36

This reduction in species usage in the resettlement area compared to the communal area was clearly evident in the four activities under consideration as depicted in Table 4.

Table 4: Number of species identified as major wood source for various activities

Activity	Species Number	
	Now	CA
Cooking	12	13
Brewing	17	23
Brick Making	15	23
Construction	20	30

The largest reduction of 10 was noted in the construction activity, a result that was also collaborated by an actual count of respondents who reported change in species usage in resettlement as reflected in Table 5.

Table 5: Proportion of respondents reporting change in species use on resettlement for each wood using activity.

Activity	Percentage Respondents
Cooking	62
Brewing	61
Brick Making	48
Construction	67

3.3.3: Ease of availability

Respondents were asked to categorise the effort needed to collect wood in Communal areas compared to now in the resettlements. The outcome, Table 6, was in favour of wood collection being easier in the latter area compared to communal areas. The reason most cited, at 90%, being the more plentiful supply of trees in the resettlement area but also less cited, but still significant, at 9 % the reason that it was due to the smaller number of people resident in the schemes

Table 6: Perceived ease of availability of fuelwood (percentage of respondents)

Degree of Difficulty	Period	
	Now	CA
Easy	94	11
Fairly Easy	5	9
Hard	1	39
Very Hard	-	41

3.3.4: Collection strategies

How wood is harvested can have a lot of bearing on its regeneration hence questions were asked on what the major source of wood was for the various wood using activities. A combined result for the various activities was tabulated; see Table 7, with the striking change being a shift to ground sourced wood in the resettlement. This is likely reflective of improved wood supply.

Table 7: Major strategies for wood collection (percentage respondents)

	Now	CA
Collection from the ground	38	15
Cut dead branches	5	6
Cut wet branches	10	14
Cut wet trees	37	51

The 10% figure for those cutting wet braches is contextually interesting especially with wet branch cutting likely to lead to either cutting of a whole wet tree or sustainable pruning. What was noticeable was the dominance of construction activity as the main blame for wet trees being cut down. Another reason for the cutting of wet trees was observed when 41% of respondents who had indicated a change in their collection strategy where asked to account for why this was so. The reasons pertaining to aggregated wood using activity are shown in Table 8.

Table 8: Motivation for change in main strategy for wood collection (% of those experiencing change)

Reason for Change	% Respondents
Improved supply	61
Trees felled in clearance of fields	12
Access to woodlots	1
Restrictions on cutting	1
No longer participate	8
Did not participate before	17

The element of improved supply, which may account for a shift towards ground collection noted in Table 8, is confirmed by 61% of the respondents in Table 8. Change in participation was noted to be

gender related with some female respondents stating that they can now participate, as the forests are closer as compared to communal areas where it was the opposite. Conversely some female respondents where actually no longer participating as they used to for they now had access to scotch carts which man used to collect bulk supplies leaving the woman to do household and field chores. Additionally 19% of the sample suggested that since men were now resident and active in farming activities in the resettlement area (a requirement of the resettlement programme), they were now taking an increased responsibility for wood collection.

To further delimit the sphere of influence of the settlers, questions were asked on the specific areas were the most wood resources were sourced. The results, as depicted in Table 9, help to shade light on the likely impact of the schemes on the surrounding ecology and very useful for future policy decisions.

Table 9: Change in source areas for collection (percentage of respondents)

	Now	CA
Around homestead	9	1
Own Fields	18	3
Grazing/Riveriene areas	62	76
Distant places	2	7
Community woodlot	7	1
Commercial farmland	-	7
Bought	-	7

As expected there has been a "significant" shift from communal to individual sources such as fields and homestead and an increase in woodlot supply compared to the communal areas. The previous statement's impact should be evaluated in light of the somewhat small, 14%, corresponding fall in the wood resources collected from grazing/Riveriene areas.

For comparison and reality check the same questions were asked of the adjacent communal communities, **Svosve** and Shurugwi, and the results are depicted in Table 10.

Table 10: Change in the area for collection for wood-using activities combined (percentage of respondents)

	Now in communal area
Around homestead	7
Own Fields	10
Grazing/Riveriene areas	29
Resettlement area	**43**
Community woodlot	4
Commercial farmland	2
Bought	6

What is immediately striking and relevant to any future planning is the heavy reliance on wood resources from the resettlement area. The situation is worsened by the fact that some of the bought or mostly barter traded wood also emanates from the resettlement area as some households try to earn money or acquire a commodity.

A critical factor (for future planning and also explaining current field wood resources), noted from this observation was that the kind of agricultural activity prior to resettlement was the key to explaining the state of the wood resources. For instance in the Wenimbi-Macheke schemes previous activity was tobacco farming which required clear cutting from fields thus the depleted field trees. In contrast the Tokwe scheme was devoted to dairy and ranching hence protected the forest resources.

3.3.5: Transportation

Transportation methods for wood resources have a bearing on gender empowerment and positive and negative implications for land resource conservation. For the case of the two schemes a combined presentation of the prevalent transport mechanisms is presented in Table 11.

Table 11: Change in wood transportation (percentage of participants)

	Now	CA
Headload	16	25
Scotchcart	76	53
Sledge	6	18
Wheelbarrow	2	1

What is evident is the increase, 23%, in Scotchcart usage and the 12% fall in sledge use. Though not very high statistically the 9% fall in headload is socially significant as it is mostly female participants who use this method thus in the resettlement area they have more flexible chore schedules and are empowered to pursue other interests.

3.3.6: Woodland management

The approach to woodland management might determine whether existing resources are sustainably utilised and also the future plans towards ensuring increased resources. For the two schemes various questions were posed to understand the settlers' position on this issue. On the subject of remnant trees in fields 71% of the respondents indicated that they still had not yet removed all trees from their allocated arable lands. In the case of trees having been removed 61% of the cases in Wenimbi-Macheke were attributed to earlier commercial farmers. Below is a summary of some of the main reasons cited for the removal of trees from fields.

- They impede ploughing (21% of respondents reported removing all trees)
- To enhance productivity (16%)
- No trees of value (6%)
- To provide fuelwood (3%)
- Instructed to do so by Agritex officers (5% in Tokwe Scheme)

Conversely for those who had left trees in the fields the following main reasons were decisive

- Provision of shelter and/or shade (44%)
- Provide Fruit/shade (28%)
- Future woodfuel supplies (15%-particulary in Wenimbi-Macheke) Lack of labour to clear the trees (6%)
- Traditional beliefs (2%)

On actual responsibility for management the traditional role of the chief though still noticeable in the communal areas of origin, in resettlement areas it appears to have been replaced by the new VIDCO (Village Development Committee) institutions. With the identification of woodlots, albeit inherited, in some of the schemes it was deemed necessary to understand who was responsible for granting permission to cut. Interestingly the result, as shown in Table 12, highlighted the ambiguous nature of who bore responsibility both between and within villages. This might be problematic where integrated management is to be introduced.

Table 12: Perceived locus of control over access to woodlots in resettlement schemes

	% Of Respondents
VIDCO chairmen	45
Conservation Group	19
Agritex	8
Resettlement Officer	12
Natural Resources Board	6

More worrying is the realisation that the same confusion over responsibility was also expressed in the case of communal woodland.

Also linked to management is tree planting activities of which in the survey encouraging responses were noted. It was evident that tree-planting activities have increased by 21% on resettlement for the sample as a whole, with 93% of respondents having planted a number of trees since being resettled. Most interesting is the variability of sources of seedlings with those expected to be in the forefront as providers certainly lacking as Table 13 shows.

Table 13: Source of seedlings (percentage of respondents participating)

	Now	CA
Agritex	8	7
Forestry Commission	7	3
Neighbours	24	31
Self raised	26	27
Relatives	3	3
Bought	13	11
Other	16	13

3.4: Zimbabwe government proposed integrated plan

Integrated Conservation Plan for Fast Track Land Resettlement 2001-2002 (GOZ 2001) is the official government dossier on what it proposes to do to ensure that the fast track land reform does not have detrimental impact on the environment. The inspiration behind it is the fear that if nothing is done the resettlement areas will, as been observed already, revert to the same state as the communal areas. Its theme is "Environment is Everyone's Business".

3.4.1: The strategies

Three strategies have been adopted on the premise that not all areas have the same potential thus for the sake of sustainability each area should be matched to its potential land use. The three strategies

proposed are namely natural resource strategies, forestry strategies and wildlife strategies, summaries of which are tabulated below.

Table 14: Natural Resources Strategies

Natural Resource Officer	To facilitate formation of conservation committees in resettlement areas. Conservation committees to consist of members of local community, government officials and NGOs
Environmental Education	Conducted for all resettled farmers so as to stimulate and promote community participation and accountability in conservation of resettlement area based natural resources
Baseline Information Collection	To be used for production of natural resources inventory maps which will be used for resource monitoring
Integrated Land Use Planning	To be done on the basis of best land use option and to be applied in all future resettlements

Table 15: Forestry Strategies

Out-grower's schemes	An out-grower scheme exists where an established forestry industry or company goes into an agreement with a farmer to produce a given forestry product (e.g. poles, firewood) that can be sold to the company.
Micro-catchment Management Scheme	Controlled utilisation of forest resources in catchment areas and promotion of richer forest ecosystems (e.g. by enrichment planting of native species). Bee keeping can also be integrated.
Grazing and Woodland Management Scheme	Certain areas e.g. in catchment areas or buffer zone to be set aside for grazing and native woodland management. Bee keeping can also be integrated.
Consolidated Garden Scheme	Integrated fruit trees (indigenous and exotic) and vegetables should be established near water sources.
Agroforestry	Legume tree species like acacia may be intercropped with maize reducing the amount of fertilizer needed or eliminating the need for it.
Small Scale Wood Industry Scheme	To directly benefit local communities. E.g. Wood Carvers and sale of forest products (e.g. madora/maximbi). Processing of forest products e.g. masawu fruits into commercial products.

Table 16:Wildlife strategies

Medium to Large Scale Game Ranching	Advantages • Satisfy the ecological requirements of a spectrum of wildlife species • Maintain the atmosphere of wilderness that is sought by tourists and safari hunters • Benefit from economies of scale
Campfire Approach	Settlers are empowered to exploit wildlife in their areas sustainably
Intensive Management of Wild Species	Can be integrated with conventional agriculture and involves farming of such species as crocodiles, guinea fowls, ostrich, fish etc.

The government has further stressed the need for involving all stakeholders with local communities being included. Further they have realised that they have to provide financial and technical resources for some of the initiatives whilst simultaneously all effort is done to ensure empowerment of the communities involved. The three official implementing agents are the Department of Natural Resources, Forestry Commission, and the Department of National Parks and Wildlife Management.

Chapter 4: Analysis

4.1: Analysis of resettlement case study data

The case study provides the local specific data needed for evaluation purposes and the gathered information aids in the requirements for formulation of an integrated and holistic plan. It provides a base for future research and monitoring of resettlement schemes hence there is an added urgency for understanding the people-land-forests dynamics.

4.1.1: Implication of perceived supply

The predominance and vulnerability of wood resources in rural life is evident in the many activities (brewing, brick making, cooking and construction) in which it is used. The findings that the changes (in the resettlement area) are more to do with level of participation and frequency of use of wood using activities instead of change in fuel source further underscore the vulnerability and certainty of use of wood resources. The findings also bring to light the non-availability of affordable alternative energy source in rural settings, further compounded by limited individual household economic resources. The finding that some respondents brew beer to raise money also supported the latter. This observation further stresses the need to understand the system as a whole for here the problem may be erroneously labelled as illicit beer brewing (author personal experience), which is banned so as to reduce tree cutting, but since its an economic issue the counter response may be selling of communal trees instead, simply shifting the problem. Nhira et al, in reference to small-scale commercial farms, alludes to the same trend in their observation that "*the need to supplement*

agricultural ***incomes*** *is realised through the sale of fuelwood to neighbouring communal area inhabitants*" (Nhira et al 1998, page 104). Likewise it has been observed that the lack of other income opportunities led farmers in central Kenya onto marketing black wattle (Arnold et al 1997). If this is the case then where planners see opportunities for settlers to engage in sustainable harvesting of indigenous species they should be investigated and where feasible facilitated. Besides getting income to buy alternative fuels the settlers will be incentivised to protect the forest resources. It should be clarified though that these benefits will accrue only if and when the planners avoid encouraging total substitution of farming by timber sale as income spinner for that may lead to overexploitation of the forests especially when, market prices go up. Conversely when the prices go down the farmers become vulnerable due to lack of viable alternative income generating activity. The key is to achieve balance in satisfying economic aspect without compromising the environmental and social aspects.

Though there has been an increase of average 16% (Table 1) in the brick making activities in the two schemes, indications are that the frequency of this activity will decrease with time as once built the brick houses have a life span of 20-50 years. It is the temporary homesteads, made from pole and dagga that have more impact on the wood resource, as their life span is shorter, 5-10 years, and take more wood per square metre. It would be advisable then to plan and facilitate financially, the adoption of brick houses in resettlement schemes as this might reduce the impact of the construction activity on forest resources. On the other hand the observed trend in brick making of favouring wet trees as fuel is a threat to the potential regeneration stock (gem plasma) so if its to be sustainable it has to shift to using dry trees. Additionally were there exists exotic woodlots in acquired farms the timber should instead be used for construction of roofs in place of indigenous trees.

The findings that on average 58% (Table 2) of the respondents who indicated a shift towards using more wood resources cited improved supply, as the reason for doing so might be indicative of a "frontier worldview". This is a perception characterised by a desire to conquer and exploit a new or hostile environment for its resources as quick as possible first coined to explain advances into frontiers of America, Miller 2000. This proposal is further collaborated by the 90% citing of ease of availability (Table 6) as being due to plentiful supply of trees in the resettlement *vis avis* communal area. One respondent was even quoted saying, "*When one has got plenty, you do not limit yourself. We have plenty of wood here so we cook our food well".* The potential impact of such a trend should be viewed in light of the household density per scheme and its rate of natural increase, which for Zimbabwe has been calculated to be 2% per annum (Chenje et al 1998) and also on the 6tonnes/household/year fuelwood demand. Furthermore factoring in the possibility of illegal settling will inevitably inflate the household figure and raise the wood resource demand. Such dynamics will consequently elevate the impact where contingency measures have not been taken. What is required is to avoid being reactive to noticeable symptoms/impact of an already degraded forest but to simply intervene by taking contingency measures prompted merely by understanding the resource use dynamics likely to lead to undesirable environmental conditions as shown by the thick arrow in Figure 3.

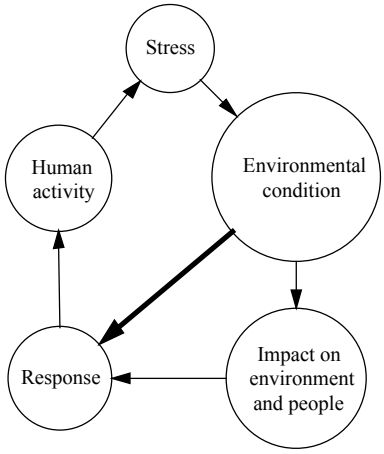


Figure 3: Response route via contingency planning

For Zimbabwe where the targets for resettlement are commercial farms and gazetted forests and where its observed that "*The heaviest concentration of forests occurs in the* ***gazetted state forests*** *areas, national parks, safari areas, and* ***large scale commercial areas****" (*Chenje et al 1998, page 274) contingency measures have never been so critical. Such contingency measures may have to include educating the settlers on the necessity of conservation irrespective of perceived plenty supply.

Additionally the impact should not be viewed as simply on the tree population instead on biodiversity too. This concern emanates from the observed "decrease" in number of species used (Table 4), e.g. 10% in construction activity, in the resettlement area that unfortunately masks the increased demand and exploitation of the few favoured species. A pointer to the reality of the impact is in the observation that in the communal areas more species where said to have been used for a particular activity not because of suitability, but because of lack of choice as the favoured species had been gradually depleted over time. For instance one respondent said "*We used muSusu for cooking in the communal area because it was easy to find although it is not normally used for cooking"* Hence planners need to be aware of the possibility of "hidden depletion" of favoured species and in their recommendations for education, monitoring and research ensure that this phenomenon is addressed. Moreover only by adopting a participatory planning approach will they be able to establish which species are most preferred and if there is need to encourage those in future nurseries then it be done so in the early days of the scheme, the essence of precautionary response.

4.1.2: Implication of changing collection strategy

Collection is synonymous with harvesting which in forestry management terms is an activity that may actually be sustainable providing certain guiding principles are adhered to. For tree stock to be sustainable the harvesting must not exceed the ecological regeneration potential or in the extreme case avoid destroying the very gene pool (Miller 2000). In this study there is unequivocally evidence in resettlement areas of a shift towards ground collection of wood (Table 7). This is a sustainable harvesting method as in nature the dead branches represent a natural shedding process by growing trees. Such practises are desirable and should be encouraged from the outset and so should institutions to support them. This is the learning from doing approach, which compliments local innovations and practises with an ultimate goal of sustainability.

That said a cautious approach is advised in the case of resettlement areas where monitors may be deceived by a "false sustainability" potentially inherent in ground collection of wood. This phenomenon arises in that though the shift to ground wood source is triggered by the high incidence of trees from field clearance it may also be maintained by further field clearance which in essence makes the collection method "sustainable" but the means to the end, forest clearance, unsustainable, see Figure 4.

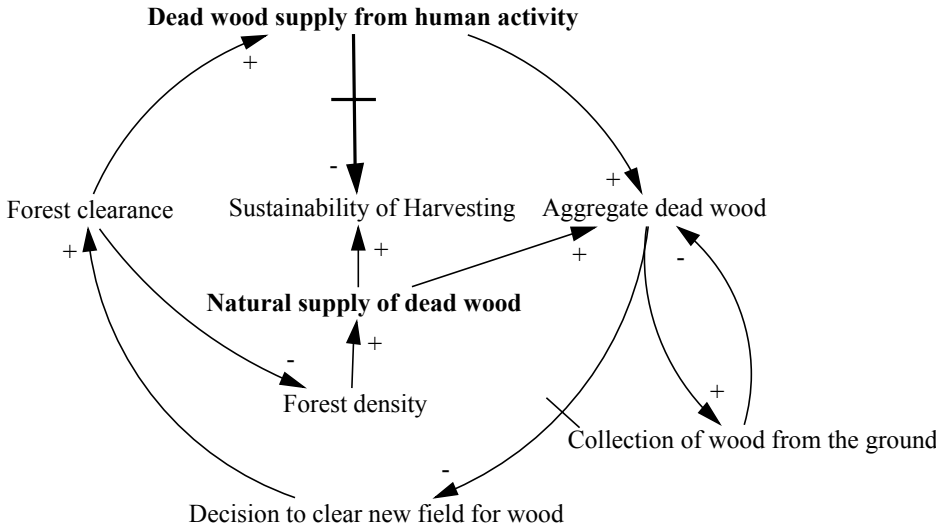


Figure 4: CLD of potential false sustainability in ground collection of wood

Explanation of dynamics

a) The desired route: an increase in forest density increasing (+) natural supply of dead wood for the process maintains the regenerating stock thus increases the sustainability of harvesting. Incidentally natural supply of dead wood actually facilitates further growth via new shoots and increased nutrient supply to soils by dead wood.

b) Undesirable path: increased forest clearance increases (+) the supply of dead wood but over time (delay) when the first dead wood supply from inevitable clearance of virgin fields runs out it increases (+) the desire to clear new fields for wood which reduces the forest density (-) which in turn reduces (-) the natural supply of dead wood thus, reducing (-) the sustainability of the harvesting. Its impact is serious in that it destroys the regenerating stock.

One observation of reduced female participation in fuelwood collection activities, a development aided by the affordability of scotchcarts and presence of male household members, may actually be of benefit to the integration process. With a flexible time schedule female members may now engage in other chores, which can include participation in tree nursery and planting clubs providing they are encouraged and funded from the onset of resettlement. Also generally they are the ones in charge of kitchen gardens which could actually aid forestry management as observed in the case of Chagga home gardens of Tanzania which though "*the plots average 0.68hectares yet they meet between a quarter and a third of farmer's fuelwood needs and almost all of their livestock fodder requirements*" (Leach et al 1988, page 65). In the interest of debate it is interesting to note that both resource abundance and scarcity may lead to the same switching of role and transport mode. A good example is the observation, in reference to fuelwood, "*where in the case of scarcity wealthier households switch to the use of animal-drawn carts rather than headloading, and thus males*

become the wood collectors" (Goebel et al 2000, page 392). Planners have to be aware of such potentially misleading scenarios when using research data to interpret trends. Additionally the use of scotchcarts is two pronged in impact. On one hand it lessens the frequency of tree cutting for sledge construction whilst on the other hand it may also lead to over harvesting and consequently wastage especially if a "plenty" view is adopted. Notwithstanding that the scotchcart appears more environmentally friendly compared with the sledge which impacts directly on trees and the soil it is dragged along.

4.1.3: Implication of shift in wood collection sites

Collection sites, besides showing the sphere of influence of the settlers are bound to experience and display earlier symptoms of depletion and degradation hence understanding their dynamics helps in formulating policies to protect them or ensure sustainable utilisation. This is critical for resettlement schemes where with land use change there is subsequent land cover change. The results of the study (see Table 9) though showing a significant shift to individual sources around homestead (8% increase), from own fields (15% increase) and from woodlots (6% increase) they are misleading for long term planning. First of all earlier argument has already hinted to the potential "false sustainability" of ground collection of wood especially field sourced wood. The shortfall with woodlots is that they have been only referred to where they have been inherited from the former farm owner, thus unless encouraged financially and institutionally they may fade away with the last cut. As for tress around homestead these were noted to be annexed communal wood resource extensions whose excludability depends on tenure and their perpetuation on individual adoption of a homestead tree farming culture or alternatively on preferential exploitation of communal resource instead (see Figure 5). The latter trend would go some way towards explaining the high, 62% (Table 9), of respondents still reliant on Grazing/Riveriene areas for their wood resources.

If there is to be contingent planning it has to consider how conservation education may be used to encourage a tree planting culture and sustainable harvesting of homestead and woodlot tree resources. This is critical since a heavy reliance on wood resources from the riveriene area will also contribute to drying of wetlands, stream bank erosion and ultimately to siltation of rivers, which in turn will affect the viability of landuses that relied on the water source e.g. cattle grazing and kitchen gardens.

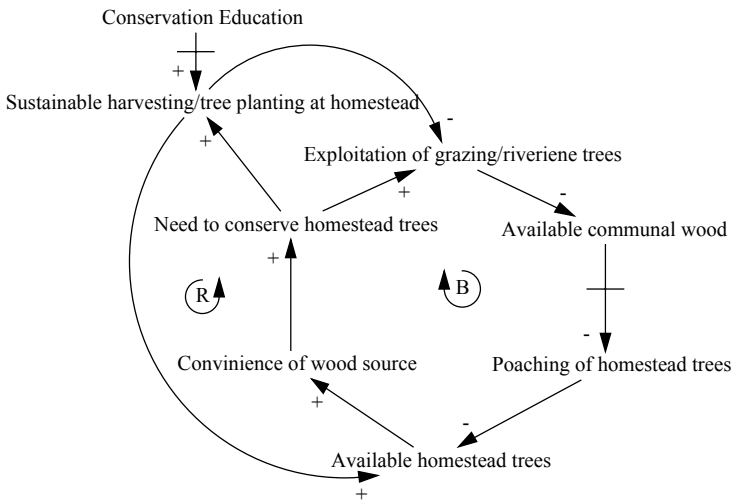


Figure 5: CLD of the dynamics around preferential exploitation of communal wood resources

Explanation of the dynamics

a) The balancing loop (B) is undesirable in that though it has apparent benefits to begin with as it diverts exploitation from homestead to communal resources it eventually leads to reduction of both homestead trees and communal resources.
b) The reinforcing loop (R) is desirable for its initiated by a diversion whose initiatives are sustainable thus eventually lead to more homestead trees and has the added double bonus of reducing communal resource exploitation and can be facilitated through appropriate education outreach and finance.

Whilst still on the subject of communal wood resource in resettlement area, viewed in total isolation from the communal area influence their level of exploitation may be statistically labelled sustainable. On the other hand allowing for the inevitable interaction between the two tenure systems introduces a whole new dimension. For instance the finding that 42% (Table 10) of the respondents in the communal area still rely on the wood resource from the resettlement area shows that simply by virtue of non residence these respondents can extend their "wood use footprint" to the resettlements and in so doing export their unsustainability. One respondent even went as far as to say "our cattle are free to graze in the resettlement areas since these people are our children" whilst another pointed out that "we can not let our relatives in the communal areas suffer from lack of firewood when we have plenty".

These findings are critical for planners to understand in light of the possibility of land reform planning introducing further disparity in forest resource distribution between communal areas and the potential resettlement areas in Zimbabwe. This is highly probable, as commercial farms that are targeted by land reform planners tend to have more wood stock resources compared to communal areas, (see Table 17) yet socially the two cannot be separated from each other. What arises here is a dilemma akin to "unbalanced books" in accounts terms.

Table 17: Population density/wood stock distribution by Natural Region and land tenure category.

Natural Region	Land Tenure Category			
	Communal	Large scale commercial	Small scale commercial	Resettlement area
	No./km^2	No./km^2	No./km^2	No./km^2
1 and 2	58	20	17	18
3	47	7	12	13
4	24	3	8	12
5	21	4	7	3
Mean	32	10	11	11
Wood stock (million tons)	**104**	**252**		11

Source: Nhira et al 1998.

One important lesson is the need for planners to be aware of these interactive dynamics and to settle people on the basis of assured local demand calibrated to potential external demand, failure of which might favour further "poaching" and resource degradation. Alternatively where acquired commercial farms border communal areas of acute wood resource shortage those inhabitants should be accorded priority settler status with outsiders being considered if and when the resource potential of the farm can still sustain more settlers.

Another significant finding in the study was the fact that the nature of the farming activity or land use prior to resettlement will have a strong bearing on the ultimate wood resource availability and soil quality. This is particularly true for woodlots whose contribution to securing sustainable utilisation of communal forests cannot be overlooked especially when for resettlement they are either there from the onset, as relics, or have to be introduced later. Where they have to be introduced the interim period becomes critical for existing communal wood resources, hence they may require special legislative and facilitative attention. Furthermore the very nature of agriculture activity practised prior to resettlement needs special analysis for, in this study tobacco farming and its huge demand for curing firewood and large expanses of land has left Wenimbi-Macheke Scheme depleted of wood resources. This contrasts remarkably with the better supplies in the Tokwe schemes of which the previous activity was mainly tree friendly diary and ranching. If planners fail to pick up on this, as is likely if the bias towards agriculture persist, there will again be mismatch of population to wood resources albeit population and agricultural land match. Furthermore the findings bring into question sole reliance on national land classification schemes for landuse planning when it does not reflect the local specific diversity of conditions. Thus to avoid mismatch and resource degradation effort should be made to assess the variance in physiognomy of acquired farms which is likely to exist since these are in essence anthropogenic landscapes.

4.1.4: Lessons from woodland management

Firstly notable in the findings is the existence of some form of woodland management albeit contextually "counter productive" in some instances. Much of the management strategy favouring tree clearance from the field, e.g. to enhance productivity and no trees of value, are strongly linked to values and priorities the farmers have hence the need to understand this aspect of society prior to policy prescriptions over land resources and their usage. Again arguably the best approach to acquire this information is adoption of a participatory planning forum.

Inexcusable and reflective of the counterproductive nature of non integrated sectoral land use planning is the directive from Agritex officers to clear fields of all trees. Conversely the decision to retain trees in fields was dominated by the need for shelter/shade, the requirement of which is approximately 1 or 2 canopied trees per 1 hectare plot (personal experience and observation in the fields). Thus, to glorify this as the future of sustainable forest management may be premature**.** What hope there is, lies in boosting the meagre number of respondents, 15%, who have retained trees for future fuelwood supplies. The retention also points to the fact that they are confident of their ability to exclude others, which defies theory considering that they have no private tenure, but simple revocable permits. It goes to show that socially there might be rules that the community have to ensure exclusion and that only by getting to the field and engaging with the people can this be picked up by planners.

On the other hand as argued earlier in this paper there is also need to be cautious and look at the wider implication of this tree retention, since it may actually mask an extended "wood use footprint" especially into communally owned wood resources.

Further pointer to a changing future in woodland management is observed in the findings that new institutions such as the VIDCOs are replacing the traditional roles of chiefs. This appears positive in light of the discrediting of chiefs for accepting bribes for land and even fuelwood, (Chenje et al 1998). On the other hand recent surveys by the land commission (Nhira et al 1998, Goebel et al 2000), have advised against the imposed VIDCOs describing them as "*obstructive to the development of community based natural resource management under CAMPFIRE*" (Nhira et al

1998, page 62). This paper takes the view that chiefs, as advocated by the land commission, would be ideal for settlers in a scheme where a whole village, culture and all (i.e. common lineage), have been settled, but not where, as is common of resettlements, people of different ethnic origin and different mystic belief are settled together. This argument may go some way to explaining why the VIDCOs not chiefs where observed to have legitimacy over resource management in the studied resettlement areas. Ideally in recognition of local communities right to self determination it is better to let each and every village decide on their new societal organisation for resource management of which planning authorities may access and facilitate by adopting a participatory/consultative planning process.

Additionally a worrying trend worth of investigation is the suggested lesser role of such crucial stakeholders as the natural resources board, conservation groups, Agritex, and resettlement officers. Without undermining or compromising the role of independent village choice of authority it would be ideal to have complete information interchange between these apparently inactive authorities and the power that be, be it VIDCOs or the chiefs, so as to ensure an integrated management. Again the issue boils down to the need for a participatory/consultative platform to be set up between the concerned stakeholders so that there is sharing of visions.

One other significant finding, planning wise, is that there is a very independent grassroots culture of tree planting, which needs government support and nurturing. This culture is compellingly evident in the high percentage, 28%, of respondents who have taken it upon themselves to raise seedlings or have gone the extra length to their neighbours, 24%, (Table 13). It is such initiatives that have to be understood and built upon by planning authorities. Those authorities of whom the most input is expected, Forestry Commission and Agritex, were conspicuous by their low contributions to siviculture. This needs to change if their future ideas and conservation initiatives are going to be welcome by the settlers. Another interesting and unusual element, considering the dogma that rural folks are poverty stricken and less likely to sacrifice their hard earned cash, is the 12% (average) of respondents who actually bought seedlings. This also entails that planners have to be consultative at grassroots level so as to pick on these local initiatives from the onset, instead of devising forestry plans in the administrative corridors of central government. Additionally education on conservation should take cognisance of these initiatives so that a two way learning process is designed.

4.2: Questioning the government prescription

With the analysis above highlighting the issues pertinent to forests and landuse dynamics it becomes necessary to cross check the integrated conversation plan that the government has proposed for the fast track land reform 2001-2. Firstly the vision statement has recognised that the solution will have to involve all stakeholders as the "environment is everyone's business". There is also recognition of diversity of local conditions and their variability in potential, which is critical for avoiding errors of mismatching land potential to use. The realisation of budgetary allocation and technical facilitation, if realised in practise would usher a new era of realised potential especially for local initiatives, which have in the past been starved of this aid. This is critical for resettlement areas were settlers are literally starting from scratch and likely to push for production at the expense of the environment so as to improve their livelihood. Moreover financial assistance may help in setting up tree nurseries and build sustainable housing.

The implementing agents are dominantly from the environment ministry, which may mean better environment management in resettlement areas. On the other hand the absence of the agriculture ministry may be a major shortfall given that the land allocation and acquisition is the fundamental

determinant of whether there is mismatch or not. The proposed strategies have their good and bad aspects too.

4.2.1: Natural resource strategy

Does well to acknowledge the importance of consultation with the local farmers and using facilitation in place of imposition when it comes to formation of local committees. On the other hand the education aspect while being commendable appears to miss the fact that the communities are not just recipients but active participants who can also share their own innovations towards environmental conservation. As noted in the analysis Agritex officers have been seen to give advice counter to forestry conservation goals. What measures have been put in place to ensure that the advice from the natural resource officers recognises the food production aspect of the settlers, failure of which may lead to a clash of values and visions and ultimately apathy.

In this strategy baseline information is to be collected so as to prepare resource inventory maps for monitoring. However with the variability and diversity of local conditions and their vulnerability to significant alteration by past activities, e.g. tobacco farming, baseline information may be vital for the process of drawing up the plans as soon as the land is acquired. This is an important aspect of precautionary approach/contingency planning and it reduces wastage of financial and manpower resources which would inevitably be required for monitoring purposes on a scheme that has been set up in a resource depleted area merely because resource inventory was not carried out prior to assigning use. Insisting on inventory for both planning and during monitoring of schemes would then fit in with the recommendation for integrated land use planning for all future resettlements.

4.2.2: Forestry strategy

The out growers scheme though important for the economic livelihood of those communities adjacent to plantations is inherently limited in location terms by the prevalence of plantations in the eastern highlands of Zimbabwe. Furthermore out grower schemes besides concentration on exotic species are market driven exposing the villagers to erratic market forces a phenomenon less likely if there is focus on strengthening traditional forestry production practises, which have greater compatibility with local conditions. By allowing controlled utilisation of forest ecosystems in the micro-catchment management scheme the benefit aspect of participatory planning and community management is realised. The sharing aspect is actually reflective of sustainability, which stresses equality in accesses to resources and recognition of local communities dependence on forest resources for their livelihood. A case in point is the successful joint forest management scheme in India in which after 10-15 years rotation the villagers receive 25% of the profit from the harvesting of Sal timber, all in a country in which 95% of the forests used to be under government control (Dey 1997). What is not explicit though is the tenure arrangement under which the micro catchment management scheme will operate. This is important in the backdrop of tenure breaches and extended "wood use footprint" noted in the analysis. The reality of the debate is that as long as there is inequality in the land resource allocation between the resettlements and communal area there will always be tenure breaches irrespective of type of tenure and associated rights granted. What more the extended family aspect of African culture depicts the sharing of resources as a traditional social obligation of which boundaries may not deter. Thus a whole novel approach may be required and might probably be centred on satisfaction of resource demand for both communal and resettlement areas, especially where the two border each other.

The same critic as above can be advanced for the grazing and woodland management scheme. Further need for clarification of tenure is on the findings that communal areas also access the same areas the resettlements are meant to benefit from. The same is also needed if small-scale wood industries are to be viable. On the matter of wood industries, potential for" hidden depletion" is high with wood carvers as they target specific species for their quality and durability. Locally selective cutting for carving purposes is already being blamed for the decline in the Blackwood species in the miombo woodlands, Chenje et al 1998. Additionally some wood carvers target plant roots for their artefacts, potentially destroying regeneration stock and making the industry sustainable but the means to the end unsustainable.

The strategy by suggesting that consolidated garden schemes **should** be established near water sources appears to impose instead of facilitating and moreover they are stating the obvious given the Zimbabwe culture on these gardens. What they have to exploit instead is the potential for the gardens to be nursery grounds for indigenous trees especially with the likelihood of female exemption from wood collection in resettlement areas. Furthermore the gardens could be a way to show that riveriene trees are important by insisting on live tree/hedge fences for gardens. This is in light of the findings that these areas are the most exploited areas for wood resources, legally or illegally.

Agroforestry is a requisite compliment for natural wood resources and thus should be encouraged especially with agriculture bearing so much of the blame for the loss of natural vegetation. That said, insisting on certain species without consulting the farmers may be overlooking local initiatives and non participatory in approach. Moreover there is need to encourage indigenous species as evidence shows that some indigenous species in parts of the eastern highlands of Zimbabwe are under threat having been invaded by exotic species such as Australian Acacia and Pinus species (Chenje et al 1998). The best agroforestry could do in the first stages of resettlement is to ensure that patches of indigenous trees are left on the homesteads, make up cattle kraal fences and shade, wind breaks, with intercropping being encouraged but the decision on species type left to the farmer who bears all the risk. With time the settlers will adjust to the area and adopt certain species for retention, which the relevant authorities should then facilitate through research and consultation.

4.2.3: Wildlife strategies

The analysis did not consider wildlife *per se* but since the argument is for integrated planning the wildlife strategies have to be viewed in the larger context of wildlife's inevitable association with forest areas and the vulnerability of the latter to loss via clearance for agricultural purposes. Viewed in that tenors allowing the community to derive benefit from the wildlife resources in their area will incentive them to protect the resource but it should be stressed that the protection has to cover all the resources since they are interlinked. Incidentally this strategy epitomises the new paradigm on resource management which recognises landscapes and wild species as being inevitably shaped by interaction with humans hence such terms as anthropogenic landscapes (Ghimire et al 1997). However there is one glitch that should be considered. This has to do with the potential negative reaction of residents of wildlife resource depleted communal areas adjoined to resettlement schemes granted this exclusive access. Arnold et al have alluded strongly to this hidden mismatch by suggesting that "even though a household might live close to woodlands or forest, if tenure of these resources belongs to other individuals or groups, ----, they are economically scarce" (Arnold et al 1997, page 192). Planning has to be cognisant of this for it is comparable with the colonial set up

which the land reform is trying to redress and is conducive to boundary breaches and clashes with high possibility of resource degradation.

Where conflict of access is not an issue the education aspect should link forest to wildlife habitat so that those involved realise the importance of maintaining the two in sustainable ways. Since agriculture clearance has been associated with loss of forests areas the government appears to underplay the importance of wildlife in those area that its proposed schemes are not applicable. In such areas there may be need to conserve forest corridors for animals to manoeuvre between cleared fields, thus realising double dividend.

Chapter 5: Conclusion

Resettlements represent a new dimension in resource use dynamics compared to communal areas thus, to realise this is the challenge for the land reform planners. Under such a scenario new tools and approaches become a necessity if resource depletion, particularly forests for this argument, is to be mitigated. The problems of the past have to be systemically and holistically defined before new plans are put in place whilst the forest aspect has to be incorporated at all stages of the planning process. Monitoring of schemes to identify the dynamics of landuse and landuse change, which includes forest use dynamics, are critical for sustainable resource management in land reforms. Empirical research as a monitoring tool and pointer to planning approach has revealed some important aspects for land use planners to be aware of as presented below.

- Resource inventory is not just necessary but is indispensable. National land use classification should be used with local conditions being also assessed because of the diversity and variability of local conditions not reflected in the former. For land reform the type of land use prior to resettlement determines the in situ state not only of land but of forests and each case is unique and should be treated so lest there is gross mismatch of land resource potential to people. More awareness of this aspect will allow for informed decisions on tenure.

- Resettling people entails land use and land cover change and certainty of wood resource demand which further reinforces the need for integration of forest into land use planning. Demand dynamics for wood resources have been shown to change in nature, space and time hence there is no room for blue print models (generalisation) instead constant monitoring is a requirement.

- System thinking aids in understanding some of the critical linkages in the forest-land-people dynamics and can be used as tool for integrated planning. Such an approach showed the possibility of hidden implication in research data, which systems thinking may help to expose such as "false sustainability" and "hidden depletion".

- Local initiatives towards integrating forests and land use should be acknowledged and facilitated where identified. Only by going local either through policy directed academic research or government monitors would the local innovations towards sustainable forest management be identified and appropriately incorporated in integrated planning for further facilitation.

- Sectoral approach leads to conflicting land use advise being given to the detriment of trees and there is evidence of that in the resettlement area with Agritex officers operating independent of and counter to Forestry commission objectives. The relevant sectors are lacking in support of local initiatives due to non-coordinated and non-integrated planning.

- Government proposal though cognisant of the need for a participatory planning process, their education proposal overlooks the contribution of indigenous knowledge on local innovations and adaptations towards sustainable resource management. Moreover most of their strategies have been shown to require revision in light of resource use dynamics in the resettlements.

Recommendations

- Employ a systems approach (environmental and socio-economic) to landuse planning and design of monitoring strategies for resettlement resource use.
- Ensure that all relevant stakeholders are represented.
- Consider future resource use trends and scenarios and identify long-term environmental or socio-economic driving forces: aided by research.
- Adopt an incremental and flexible approach to land redistribution in order to learn from experience whilst also meeting attainable goals.
- Monitor (e.g. with targeted academic research) resettlement schemes for resource use dynamics and record the lessons learned and then adapt future planning and monitoring strategies accordingly.
- Bottom up approach with emphasis on developing sense of ownership of landuse planning.
- Where feasible within given ecological limitations allow the community to exploit and benefit from resources within their confines.
- Ensure that resource distribution is equitable in time and space especially between resettlements and communal areas.
- Ensure that sectors operate under common guiding rules or else increase the coordination between them on landuse planning issues.

Take Home

- A successful land reform is not just one that avails more land to the black majority but one that will balance what can be obtained sustainably within the confines of the natural potential with the aspirations of the people (black and white).
- Zimbabwe needs land use planning that meets the land requirement of the present black and white generation without compromising the sustainable management of forest resources

Future Research

There is an urgent need for a detailed survey of the resource use dynamics and inventory in all resettlement schemes done to date in Zimbabwe so as to understand the implications for future planning and to allow for interventions earlier where gross mismatch has already occurred due to wrong assumptions in planning or sectoral approach. This takes great significance in the wake of the recent unplanned land occupations and the subsequent granting of settler right to the occupants.

References

Arnold, M.J.E. Dewees, P.A. (ed). 1997. Farms, trees and farmers: Response to agricultural intensification. Earthscan, London.

Bradley, P.N. Woodfuel. 1991. Women and Woodlots: Volume 1.The Foundation of a Woodfuel Development Strategy for East Africa. Macmillan. Hong Kong.

Chenje, M. Sola, L. Paleczny, D. (eds). 1998.The State of Zimbabwe's Environment 1998. Government of the Republic of Zimbabwe, Ministry of Mines, Environment and Tourism.

CSO (Central statistics Office). 2000. Zimbabwe: Environmental Statistics. Central Statistical Office.

Dey, C. Women Forests Products and protected areas: a case study of Jaldapara Wildlife Sanctuary, West Bengal, India, in Ghimire, K.B. Pimbert, M.P.(ed). 1997. Social Change and Conservation. Earthscan Publication limited.

Elliott, A.J. 1995 Ch.20. Government policies and the population-environment interface: Land Reform and distribution in Zimbabwe in (ed) Binns T (1995) *Peoples and the Environment in Africa*. John Wiley and sons, Chichester

Elliott, J.A. 1993. The sustainability of household responses to fuelwood needs in the resettlement areas of Zimbabwe: Preliminary report of the survey findings. Unpublished report. Department of Geography, University of Zimbabwe/Staffordshire University.

Elliott, J.A. Campbell, M.2002. The environment imprints and complexes of social dynamics in rural Africa: cases from Zimbabwe and Ghana. Elsevier Science Limited.

FAO. 2000. The challenge of sustainable forestry development in Africa. Twenty first FAO regional conference for Africa.

FAO. 2000. The challenges of sustainable forestry development in Africa. www.fao.org.

FAO.1995. Planning for sustainable use of land resources: Towards a new approach. FAO Land and Water. Bulletin 2. Prepared by Land and Water Development Division. Rome. Online: www.fao.org/docrep/V8047E/v8047e00.htm. Accessed-15-05-2002.

FAO. 1993. Guidelines for land use planning. Development Series 1. FAO. Rome.

Gardner, T. G., Stern, P.C. 1996. Environment Problems and Human Behavior. Allyn and Bacon. Boston, London, Tokyo.

Ghimire, K.B. Pimbert, M.P.(ed). 1997. Social Change and Conservation. Earthscan Publication limited.

Gibson. C.C. Margaret A. Mckean, and Ellinor Ostrom. 2000**.** People and Forests: communities, institutions, and governance. The MIT Press. Cambridge, Massachusetts, London, England

Goebel, A. Campbell, B. Mukamuri, B. Veeman, M. 2000. People, values, and woodlands: A field report of emergent themes in interdisciplinary research in Zimbabwe. *Agricultural and Human Values 17. Kluwer Academic,* Publishers Netherlands.

GOZ (Government of Zimbabwe): 2001. Integrated Conservation Plan for Fast Track Land Resettlement 2001-2002. Ministry of Environment and Tourism.

Guerin, T.F. 2001. Why sustainable solutions are not always adopted. *Resources conservation and recycling.* Volume 34. Elsevier.

Harts-Brokhuis, A. Huisman, H. 2001. Resettlement revisited: land reform results in resource poor regions in Zimbabwe. *Geoforum 32*. Pergamon.

Leach, G. Mearns, R. 1988. Beyond the Woodfuel crisis: People, Land and Trees in Africa. Earthscan Publication Limited.

Kutter, A.. Nachtergaele, F. O. Verheye,W.H. 1997. The new FAO approach to landuse planning and management, and its application in Sierra Leone. *ITC Journal 3-4*.

Marcoux, A. 2000. Population and deforestation. Sustainable Development Department (SD), Food and Agricultural Organization of the United Nations (FAO). www.Fao.org, (Accessed 12-10-02)

Miller, G.T. (Jr). 2000. Living in the environment: principles, connections, and solutions. Eleventh Edition. Brooks/Cole Publishing Company, London, New York and Tokyo.

Moyo, S. 1995. The Land Question in Zimbabwe. Southern African Regional Institute for Policy Studies, SAPES Books, Harare.

Nhira. C. Baker S. Gondo. P. Mangono. J. J. Marunda. C. 1998. Contesting inequality in access to forests: Zimbabwe Country Study. In Mayers J (ed). Policy that work for forest and people series 5. www.iied.org, (Accessed 12-06-02).

Sanchez, A. P. Leakey R.R.B. 1997. Land use transformation in Africa: three determinants for balancing food security with natural resource utilization. *European Journal of Agronomy*. Elsevier.

Senge, P.M.1990. The Fifth Discipline: The art and practise of learning organisation. Random House Business Books.

Smith, J. 1996. Planning and Decision Making: An active learning approach. Blackwell Publishers Limited.

Tikare, S. Youseff, D. Donelly-Roark, P. Shar, P. 2001. Organizing participatory process in the PRSP. World Bank.

Van Lier, H. N. 1998. The role of land use planning in sustainable rural systems. *Landscape urban land planning 41*. Elsevier.

White, A. Martin, A. 2002. Who owns the world forests? Forest tenure and public forests in transition. Forest Trends.

Wily, A. L. 2002. The political economy of community forestry in Africa-Getting the power relation right. *Forest, Trees and People. Newsletter No.46.*

World Bank. Land policy and Administration. A lesson learned and new challenges for the Bank's development agenda. www.worldbank.org, (Accessed 31-05-02).

APPENDIX: QUESTIONNAIRE

A) BACKGROUND QUESTIONS

10a) How easy is/was it for you to obtain firewood for your household?

	Now	In CA
Easy		
Fairly Easy		
Hard		
Very Hard		

10b) If it easier now than in the CA, why is this so?

Less people	
More trees	
Better trees	
More/better transport	
Woodlots	
Can buy wood	
Other	

10c) If it is the same or harder now, why is this so?

Not enough trees	
Not desired species	
Transport problems	
Labour problems	
Restrictions on collection	
Other	

B) USE OF WOOD

1) What kind of fuel is commonly used by your household for:

		Wood	Paraffin	Charcoal	Gas	Electricity	Coal	N/A
Cooking/heating	NOW							
	IN CA							
Lighting	NOW							
	IN CA							
Brewing	NOW							
	IN CA							
Brick Making	NOW							
	IN CA							

2a) What is the most common tree which your household uses for cooking and heating?

Now _____

IN CA _____

2b) Why did your household use this particular species in the CA?

2c) If this has changed, why is it different now?

3a) What is the most common species your household uses for brewing?

NOW _____ NA
IN CA _____ NA

3b) Why did your household use this particular species in the CA?

3c) If this has changed, why is it different now?

4a) What is the most common species your family uses for making bricks?

NOW _____ NA
IN CA _____ NA

4b) Why did your household use this particular species in the CA?

4c) If this has changed, why is it different now?

5a) What is the most common species your family uses for roof construction?

NOW _____ NA
IN CA _____ NA

5b) Why did your household use this particular species in the CA?

5c) If this has changed, why is it different now?

6a) What is the most common species your family uses for kraal and fence construction?

NOW _____ NA
IN CA _____ NA

6b) Why did your household use this particular species in the CA?

6c) If this has changed, why is it different now?

7a) How often on average does your household cook/heat?

	NOW	IN CA
3 times daily		
2 times daily		
Once daily		

7b) How many bundles of firewood does your family use each week for cooking purposes?

NOW _____
IN CA _____

7c) What is the reason for nay change?

8a) How often on average does your household brew?

	NOW	INCA
>A fortnight		
Fortnightly		
Monthly		
Every 3-6 months		
Every 6-12 months		
< 1 a year		
N/A		

8b) How many bundles of firewood does your household use each time you brew?

NOW _____ NA
IN CA _____ NA

8c) What is the reason for any change

9a) How often in your household does anyone bake bricks?

	NOW	INCA
>A fortnight		
Fortnightly		
Monthly		
Every 3-6 months		
Every 6-12 months		
< 1 a year		
N/A		

9b) How many bundles of firewood does your household use each time you bake bricks?

NOW _____ NA
IN CA _____ NA

10a) What did you use in the construction of walls for ?

		Poles	Daga	Bricks
Sleeping huts	NOW			
	IN CA			
Kitchens	NOW			
	IN CA			
Granaries	NOW			
	IN CA			

C) WOOD COLLECTION

1a) When your household collects wood for heating and cooking what is the main source of wood?

	NOW	IN CA
Collection from ground		
Cut dead branches		
Cut dead trees		
Cut wet branches		
Fell wet trees		

1b) What is the reason for any change?

1c) Where does/did most of this wood come from?

	NOW	IN CA
Around homestead		
Own fields		
Own woodlot		
From neighbours		
Grazing/riveriene areas		
Distant places (town/relatives)		
Community woodlot		
Others		

1d) What is the reason for any change?

2a) When your household collects wood for construction, what is the main source of wood?

	NOW	IN CA
Collection from ground		
Cut dead branches		
Cut dead trees		
Cut wet branches		
Fell wet trees		

2b) What is the reason for any change?

2c) Where does/did most of this wood come from?

	NOW	IN CA
Around homestead		
Own fields		
Own woodlot		
From neighbours		
Grazing/riveriene areas		
Distant places (town/relatives)		
Community woodlot		
Others		

N/A		

2d) What is the reason for any change?

3a) When your household collects wood for brickmaking, what is the main source of wood?

	NOW	IN CA
Collection from ground		
Cut dead branches		
Cut dead trees		
Cut wet branches		
Fell wet trees		

3b) What is the reason for any change?

3c) Where does/did most of this wood come from?

	NOW	IN CA
Around homestead		
Own fields		
Own woodlot		
From neighbours		
Grazing/riveriene areas		
Distant places (town/relatives)		
Community woodlot		
Others		
N/A		

3d) What is the reason for nay change?

4a) When your household collects wood for beer brewing, what is the main source of wood?

	NOW	IN CA
Collection from ground		
Cut dead branches		
Cut dead trees		
Cut wet branches		
Fell wet trees		

4b) What is the reason for any change?

4c) Where does/did most of this wood come from?

	NOW	IN CA
Around homestead		
Own fields		
Own woodlot		
From neighbours		
Grazing/riveriene areas		
Distant places (town/relatives)		
Community woodlot		

Others		
N/A		

4d) What is the reason for any change?

5a) Who in the household gathers the majority of wood?

		Male adult	Female Adult	Children under 16	Mixed group
Cooking/heating	NOW				
	IN CA				
Construction	NOW				
	IN CA				
Brewing	NOW				
	IN CA				
Brick Making	NOW				
	IN CA				

5b) If any change what is the reason for this?

6a) What is the main wood transport method used by your household?

		Head load	Bike	Scotchcart	Sledge	Wheel Barrow
Cooking/heating	NOW					
	IN CA					
Construction	NOW					
	IN CA					
Brewing	NOW					
	IN CA					
Brick Making	NOW					
	IN CA					

6b) What is the reason for nay changes between wood transport now and in the CA?

D) TREE MANAGEMENT AND CONTROL

1a) When you cleared your fields for cultivation, did you remove all the trees?
Yes/No

1b) If yes, why?

1c) If no, why did you leave some trees?

2a) Has anyone in your household planted any tress?

	Since in RA	IN CA
Permit holder		
Wife		
Joint male/female		
Other		
N/A		

2b) Approximately how many trees did you plant?

	1-2	3-5	6-10	>11
Since in RA				
IN CA				

2c) What was the main reason for planting trees?

	IN RA	IN CA
Shade		
Fruit		
Poles		
Firewood		
Advised to		
N/A		
Other		

2d) Where did you plant these trees?

	IN RA	IN CA
Around household		
On dry fields		
On home fields		
Individual fields		
Community woodlot		
Grazing land		
N/A		

2e) Where did you obtain the seedlings from?

	IN RA	IN CA
Resettlement officer		
Agritex		
Forestry commission		
Neighbour		
Other		

2f) If no is there any particular reason why you have not planted any trees?

	IN RA	IN CA
Plenty of trees		
Desired seedlings unavailable		
No experience/extension advice		
Seedlings too expensive		
Insufficient water		
Lack of land		
Fear of theft of seedlings/products		
Problems of termites		

Other		

4a) Is/was there a community woodlot in your area?

	Now	IN CA
Yes		
No		
Don't know		

4b) Who is/was responsible for taking care of the trees in the woodlot?

	NOW	IN CA
Traditional heads		
VIDCO chairman		
Conservation group		
Agritex		
Forestry commission		
Resettlement officer		
All residents		
Other		

4c) Who was/is responsible for giving permission to collect wood, fruits, leaves pr other products from these trees in the community woodlots?

	NOW	IN CA
Traditional heads		
VIDCO chairman		
Conservation group		
Agritex		
Forestry commission		
Resettlement officer		
Other		

5a) For trees in the Grazing and riveriene areas around your village who is/was responsible for taking care of the trees?

	NOW	IN CA
Traditional heads		
VIDCO chairman		
Conservation group		
Agritex		
Forestry commission		
Resettlement officer		
All residents		
No one		
Other		

5b) For trees in the Grazing and riveriene areas around your village who is/was responsible for giving permission to collect fruits, leaves or other products from these trees?

	NOW	IN CA
Traditional heads		
VIDCO chairman		
Conservation group		
Agritex		
Forestry commission		
Resettlement officer		
All residents		
No one		
Other		

5c) Who is/was allowed to collect/use the products from these trees in the grazing/riveriene areas?

	Now	IN CA
Conservation group members		
Residents of area		
Everyone		
Other		

F) CONTACT WITH NEIGHBOURING AREA

1a) Does your household ever gather firewood/construction to send to relatives or others in:

	Now	IN CA
Neighbouring CAs		
Other CAs		
Marondera		
Harare		

1b) What are the advantage of being close to the Communal areas?

1c) What are the disadvantages of being close to the Communal areas?

NB: the same questions with few amendments to reflect the change in emphasis were asked to the adjoining communal areas of Svosve and Shurugwi. Some of the questions not connected with the summary presented in this analysis been omitted but can be found in the preliminary report by Dr J Elliot (1993).