

## **2. Demographic and cultural environmental factors**

GMA's show a range of variation in how human populations have settled in and around these areas. Such variation represents an interesting pattern of human contact with renewable resources as well as effects on CBNRM success. Within these populations, there also exists considerable variation in social characteristics that are likely to influence CBNRM's effectiveness in building local consensus and commitment to ecologically sustainable land use practices.

### **Variables and general concepts**

Some of these factors considered in this study were:

- 1) **Human population size of community land owners of a GMA**  
Local support for CBNRM as a land use that complements more conventional land uses depends on the level of benefit individual households realize from CBNRM activities in their area. As populations increase, the level of CBNRM benefits is likely to decrease. Competing land use options that may threaten CBNRM objectives are also likely to increase as populations grow.
- 2) **Human populations residing within a GMA**  
Human ownership of a resource presupposes a certain level of responsibility for it. In this regard, communities that live close to the resource and adhere to good land use practices may provide a certain level of custodial protection over their land and resources. More remotely settled landowners might be expected to be less involved in the management and protection of their resource and thus lower the chances of CBNRM success for that area.
- 3) **Population growth trends**  
Population age structure for a resident GMA community provides a basis for predicting future growth in the population. Current scenarios of population pressures as a threat to CBNRM objectives in some ADMARE areas suggest limits are already being reached. If human populations exceed resource limits, then meeting human needs through sustainable land use will be improbable. Once such limits have been reached, chances for CBNRM success are reduced and more draconian measures that depend on more external interventions are likely to be required. For this reason, CBNRM practitioners should make this issue a highly visible one for continued community discussions and education.
- 4) **Fragmentation of human settlements in a GMA**  
The more fragmented settlements are in a GMA, the greater the difficulty local leadership may have in coordinating CBNRM activities, disseminating information, and reaching consensus on decisions that improve resource production and community needs. In addition, the more scattered communities are, the more difficult it becomes for capital projects (e.g. schools) to benefit all households. As communities become more fragmented and scattered, it also becomes more difficult to monitor their land use and effects on revenue production.
- 5) **Number of traditional leaders associated with a GMA**  
Increased number of traditional leaders are likely to increase the difficulty in reaching consensus among local leaders in coordinating a more united support for CBNRM objectives and procedures.

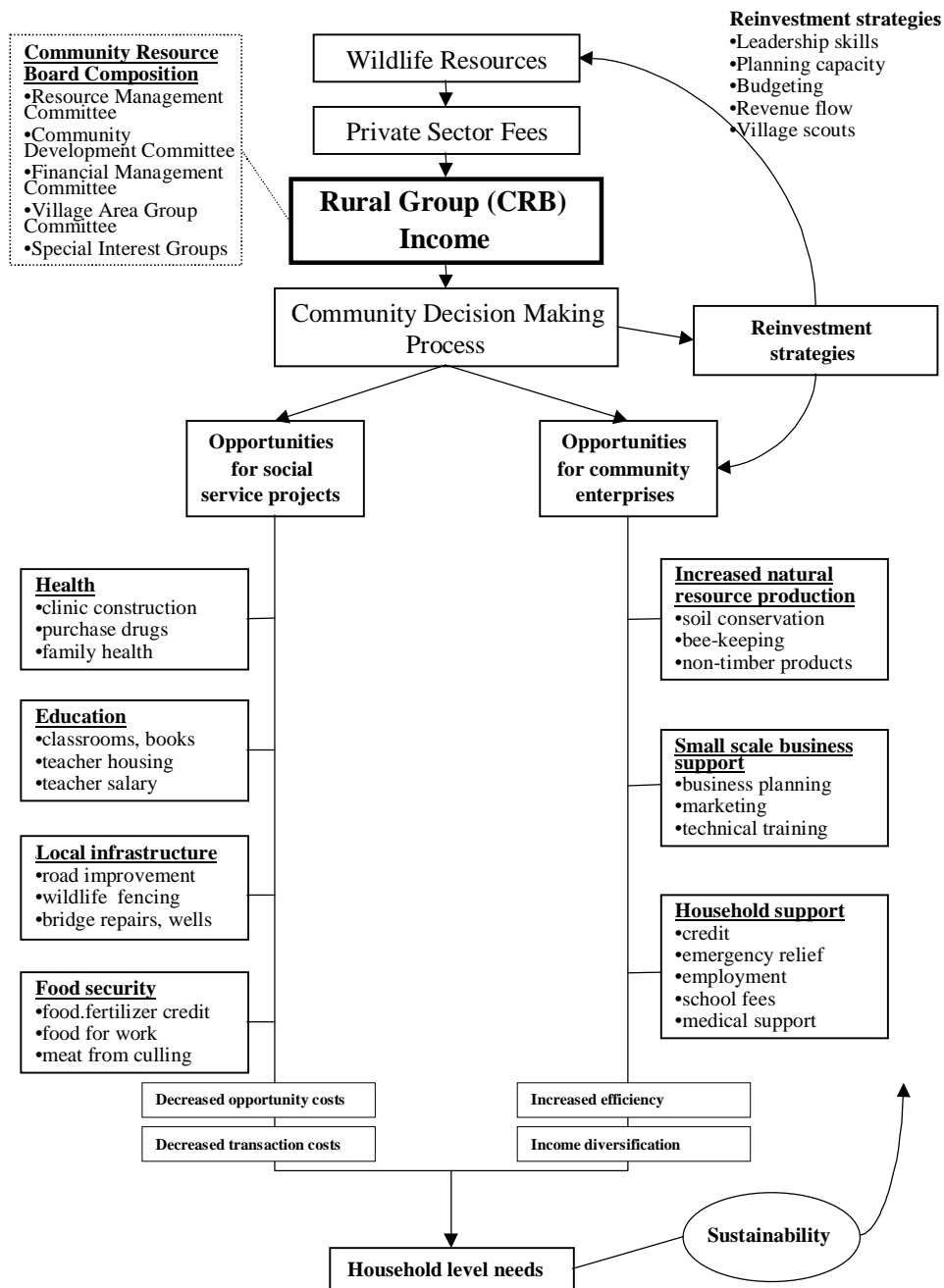
6) Level of skills available within the community for administering and implementing CBNRM.

The level of skills acquired by CBNRM leaders in the community will improve the sustainability and long-term success of ADMADE.

The basis for improving local living standards in the ADMADE program has historically been to channel 35% of the total revenue collected by the Wildlife Conservation Revolving Fund (WCRF) through a locally administered leadership authority, called the Wildlife Management Sub-authority and chaired by the local Traditional Ruler. This structure was based on the assumption that ADMADE should not attempt to alter existing leadership structures in a village community but rather strengthen existing ones, realizing that powers of the Traditional Rulers could be exceedingly important in unifying communities around the ADMADE concept of sustainable development. In practice, the Royal Families, who often dominated the decisions made by the sub-authority, to a large extent controlled the benefits funded by its 35% share. As was predicted, however, Traditional Rulers did in fact make a number of important contributions in resolving land use conflicts, most especially village encroachment in wildlife sensitive areas.

Despite efforts to monitor the use of this 35% share and facilitate numerous workshops to more equitably distribute its potential benefits for all households, the problem continued. A national consensus was carried out to review this problem and develop a new design that would allow a more accountable flow of ADMADE benefits to all members of the community. What emerged from this process was a new leadership design that was based on a democratically elected Community Resource Board having executive powers and responsibilities for promoting the ADMADE objectives of resource management and community development. In particular it required ADMADE revenues to be fairly distributed in the community according to Village Area Groups ( or VAGs). It also required that these Boards be democratically represented by residents of these VAGs and that Traditional Rulers be Patrons to the Boards to provide oversight and advice. Figure 19 below provides a description as to how this new ADMADE design is expected to work.

**Fig. 19. ADMADE Framework: Impact on Household Needs**



Efforts are currently underway to facilitate the election of these CRBs, provide necessary skills to the newly elected members, and introduce new financial controls and procedures for how funds will be administered. As these changes are put into place, past lessons into how demography and social factors can influence CBNRM results are presented below to help guide these new initiatives as part of the restructuring of ADMADE.

Population size effects

Population size of a community residing in a CBNRM area will likely lower chances of CBNRM success if it 1) contributes to a decline in per capita benefits, 2) increases resource use conflicts, and 3) increases the difficulty in administering CBNRM for community-wide participation and acceptance. This will more likely occur as populations grow and exceed certain manageable limits for CBNRM to succeed. Likewise, if a community is too small or is not physically living in the area where the resource is managed, chances for CBNRM success may also be reduced. As an 'absent land owner' the community may not be physically present to protect the resource from outside disturbances. If community members reside elsewhere and practice a different land use (e.g. livestock), wildlife may be considered irrelevant to their primary source of livelihood.

The Lozi tradition provides a CBNRM solution to this problem. The Litunga (or the Paramount Lozi Chief) settles well trusted headmen together with their villages in areas where specific natural resources need protection and where there is an absence of trusted people to provide such protection. Liuwa Plains, for example, is a source of meat and cultural pride for the Lozis due to the large numbers of wild animals, especially wildebeest. To ensure protection of this resource, the critical area where these populations range is surrounded by villages whose headmen help protect the resource from any source of destruction.

Some of the possible effects population size may be having on specific CBNRM areas in Zambia are summarize in Table 2 below:

Conditions where populations size may exceed CBNRM limits	Threats
1) Upper Lupande	Increased consumptive rates of natural resources (timber, fish and wildlife), encroachment of wildlife habitat, urbanization (same as Upper Lupande) Encroachment of wildlife habitat, timber loss, excessive fires and honey-gathering Loss of habitat from agricultural expansion Loss of habitat from agricultural expansion, conflicts around vital wildlife waterholes
2) Lower Lupande	
3) Mumbwa East	
4) Kaputa	
5) Bilili	
Conditions where CBNRM areas are not settled or w/o residents	
1) Lunga Busanga	Vulnerable to poaching without well organized community role to protect resource
2) Lunga Lushwishi	Vulnerable to meat trafficking from Copperbelt and lacks presence of local residents to police area
3) Nkala	Nil, area small enough to have adequate contact with local land owners
4) Sichifulo	Residents living outside GMA not involved or protective of wildlife, poaching high

The Lupande areas represent a particular challenge for CBNRM and may actually be a lost opportunity for planning CBNRM in a highly populated area. This GMA is center to the growing commercial market of mass game-viewing tourism. Much of its underdesirable spin-offs in terms of secondary businesses and immigration of people for job opportunities have not been well planned. The unfortunate build-up of these industry related disturbances has promoted increased rates of resource use conflicts that have now become difficult to control. Possibly related to these dynamics is the growing

sense of economic and material expectations among local residents, possibly associated with tourist lodges, lodge owners and visiting clients. Compounded to these considerations is the fact that much of the tourism industry is in close proximity to village communities in the GMA.

To support the wildlife tourism industry, road access to Lupande is favorable, and this has facilitated a rapid growth of economic expansion and agricultural development. Cotton, for example, has become an important cash crop, far exceeding the possible rewards wildlife is able to bring to household producers, especially those not employed in lodges. The complexity of these issues, combined with a population of over 40,000, may well jeopardize CBNRM success in Lupande and may therefore justify greater external interventions by Government to ensure land use zoning is implemented and enforced. Continued reliance on CBNRM as the appropriate process for achieving these results may allow further erosion of the natural resource base for the area. Alternative approaches may need to be considered.

The critical lesson Lupande offers Zambia for its CBNRM efforts is for community leadership to plan and be firmly committed to their land uses at an early stage and to better anticipate the ecological consequences of both economic and human population growth in a CBNRM area.

To a certain extent, Mumbwa East has many of the characteristics of the Lupande area, though on a smaller and possibly more manageable scale. Improved road development, high human population and greater access to agricultural markets has fueled an increased pressure on farmland and thus increased encroachment on Mumbwa East. The consequence on the community's wildlife industry has been severe, which has contributed to cessation of safari hunting in the area and a substantial loss of ADMADE income for the community. Perhaps for this reason, resolve by the community to limit settlements in the hunting area has been shown by pledging to solve these issues in a co-management agreement with a new investor, who is making substantial investments to help reopen Mumbwa East as a safari hunting area.

Human population pressure on Bilili and Kaputa has likely had irreversible negative trends on wildlife production for these two GMAs. While limited safari hunting is still practiced in Bilili, and was once one of the best areas to hunt buffalo in Zambia, more than half of the area is farmland with severe competition for waterholes formerly used exclusively by wildlife. Legal hunting has now ceased in Kaputa GMA because of depleted wildlife stocks and loss of wildlife habitat from increased settlements.

If communities are proven to be effective allies in resource management through the CBNRM approach, then areas lacking residency by the community landowners may limit the positive role communities can play. Among the areas where this problem may be most relevant is Sichifulo and Lunga-Lushwishi. Both are exposed to nearby urban markets and in the case of Sichifulo, residents practice farming practices with livestock outside the GMA and may have developed stronger cultural ties to livestock and farming than wildlife as a land use. Both areas experience relatively high rates of poaching and neither have demonstrated a strong protective role by the community, except for their salaried village scouts.

#### Factors influencing household benefits from ADMADE

Decisions on how to utilize the community development funds (the 35% share) has been solely the responsibility of the Wildlife Management Sub-authority, with minimal influence by WCRF, NPWS or Nyamaluma, other than to monitor and intervene when flagrant violations of financial controls have occurred. In addition, numerous training seminars were provided by Nyamaluma to help improve the participatory process local leaders use in planning and implementing ADMADE projects. Table 3 summarizes projects supported by ADMADE or by collaborating ADMADE partners (e.g. safari operators, local NGOs) for the period from 1996 though 1998 (funds have not been released yet for 1999).

Unit name	VAG Name	Count of projects	\$ Total
Chifunda	Kasela	12	18559
	Luelo	7	36464
	Mapamba	2	7141
	Zumwanda	2	6477
Chikwa	Chilumba	2	1136
	Chimpamba	1	1119
	Lilundi	1	1444
Lower Lumimba	Lumezi	10	43393
	Chasera	3	532
	Chasera and Mukasanga	1	15011
	Lukusuzi	2	3128
	Mukasanga	1	2040
	Mukwela	10	34395
Munyamadzi	Yakobe	1	889
	Chilima	1	17
	Kalimba	1	17
	Kazembe	1	17
	Nabwalya	1	17
Upper Lumimba	Pelembe	1	17
	Chocha	11	9530
	Kataba	9	2555
	Kazembe	1	8959
	Lumimba	4	2917
	Nthumbe	4	2654
	Zokwe	2	1288

While the total number of projects is generally impressive, the community process used for assessing household needs for project identification and supervising project implementation and expenditures has been controlled by the Sub-authority. Despite efforts to create Village Area Group structures to bring the process of decision-making down to a lower level, success has been mixed. Where these efforts have been relatively successful, response by the community to support objectives of wildlife conservation has also improved. Where efforts have been unsuccessful, the converse has been true.

#### Case Study: Chifunda

*During 1995 and 1996, decision-making by the Sub-authority was centralized around the local Chief and all projects were being carried out near the Chief's Palace . Wildlife poaching was high and the unit leader concentrated on improving housing for his staff and reopening wildlife camps. During these two years local residents provided no information on poaching activities to assist with the area's law enforcement, nor did any member of the community surrender any firearms. During the 1997 and 1998, the new ADMADE structure was introduced that recognized Village Area Groups and Sub-authority Sub-committees for helping facilitate community discussions to identify projects and allow more people to participate in them. By the end of 1998, each VAG had its own ADMADE project and in that same year, the Chief and the Unit Leader received 21 muzzle-loading guns surrendered by local residents and between 20 and 25 village informants helped in bringing about 11 different arrests of people who violated the Wildlife Laws of Zambia.*

#### Case Study: Munyamadzi

*VAGs were created in 1998 with the election of committee members. A major problem recognized by nearly all VAGs was food shortages during the wet season and VAGs requested ADMADE funds purchase food relief. By the end of 1998, the Financial Management Committee and the Community Development Committee (CDC) had successfully purchased and transported 650 bags of maize from Lundazi to Kanele in Munyamadzi GMA. This feat involved considerable planning. Such a community-run enterprise had never been carried out before. Maize was distributed to each VAG and the CDC provided leadership to ensure families most vulnerable to famine and without the resources to buy maize were give maize for free. Other families were allowed to buy or have maize on credit at cost.*

*From Sept 1997 to Sept 1998, there were eight cases of local residents apprehended for wildlife law offenses and no cases of local informants assisting with arrests by village scouts. During the period from Oct 1998 to May 1999, there was only one case of a local resident apprehended and there was a total of 7 incidences where residents provided information about the presence of poachers in the area.*

#### Case Study: Chanjuzi

*In 1997 a financial scandal cost the community in excess of K10,000,000 from their community funds. The community book-keeper was charged with forging cheques and suspicions arose over possible involvement by members of the Sub-authority. Tragically, the unit leader took his own life, though his own involvement in the case was never clear. Throughout 1998, funds were withheld from the community until legal investigations were carried out and a new bookkeeper was trained and certified. As a result, the new ADMADE structure was not put into place and no new projects were supported for the entire year. Because of the scandal and apparent breakdown in leadership, introduction of VAG structures was also delayed. In short, Chanjuzi became a dysfunctional ADMADE unit until the end of 1998 when a new unit leader was assigned to the area and community meetings were convened to establish VAGs with assurances their 1998 earnings would be allocated to them once the new ADMADE system was introduced.*

*Prior to this and during most of 1998, Chanjuzi experienced a serious breakdown of community commitment to conservation. Residents resettled in Chipuka Plains, which had previously been zoned by community leaders as a no settlement area to help support safari revenues for the unit. Lion baits were vandalized by local residents and poaching occurrences increased to levels that forced the professional hunter to leave the area early in the season. Fortunately, the local chief played a pivotal role with members of his Resource Management Committee to evict the settlers from Chipuka Plains and early in 1999 the community adopted stringent controls on their land use plans to reduce disturbances that might jeopardize the industry.*

#### Factors contributing to poor distribution of ADMADE benefits

ADMADE has operated under an administrative setup from its inception without strict legal mechanisms governing its procedures. This arrangement was largely based on trust that local leaders representing the community would uphold good governance for their ADMADE activities. Regular visits to the units by WCRF, Nyamaluma or Command Wardens may have encouraged such governance but due to insufficient funds, such visits were infrequent at best. This weakness in the programme may have created opportunities for financial abuse. For example, there have been no official audit inspections of community accounts for the past two years. While details are sketchy, financial mismanagement is evident in many ADMADE areas and appears more widespread in Kafue areas where unit visits have been significantly less than in Luangwa areas.

One source of abuse has been the local chiefs themselves, who serve as signatories to the community account and therefore have much control over the use of these funds. There are cases of almost total monopolistic authority of these funds and in some instances, this has led to serious stagnation of ADMADE progress. In Sichifulo, for example, the Royal family has regarded the ADMADE funds as their personal account and has used it for personal 'allowances' and not a single community project has been implemented in Chief Nyawa's area for the past two years. Similar abuse of controls meant to protect community's interests in ADMADE has been identified for West Petauke, Lower Luano, and certain Chiefs in Mumbwa area. As mentioned earlier, Chanjuzi lost a complete year of ADMADE funding in 1998 because of the mismanagement of ADMADE funds the previous year by the community bookkeeper for that area.

Most of the Chiefs in the Luangwa Valley have used community funds to construct new Chief's palaces, at an average cost of \$9880. While such projects were approved by the Sub-authority, there is obvious concern over how much influence the local chiefs have had in adopting these projects. Other projects that might have reduced wildlife conflicts or improved living standards for households income production in the area were obviously delayed or cancelled because of competition for funds. For example, in Chikwa area the Chief has embarked on a new Palace for himself while Kanga VAG, which is the sole source of wildlife income for Chikwa area on the east bank, has never been supported with a single project. Land use disturbances are very high in this VAG where people have to compete with wild animals for water and prime hunting areas are frequently disturbed by local fishermen and honeygatherers. A similar situation exists in Mwanya where relatively little ADMADE benefit has been provided to Yakobe VAG and yet most of the revenue earned in this unit is derived from Yakobe area. While

such decisions may reflect poorly on the judgement of those people holding positions of leadership, they also suggest a lack of understanding about these relationships and the critical need to provide training on how to plan development priorities when such development is linked to resource revenues.

Another factor that has influenced the flow of ADMADE benefits to community members is the high cost of maintaining a community vehicle. A number of units (Mwanya, Chikwa, Chifunda and Munyamadzi) have bought community vehicles with their ADMADE revenues, and while impressive in terms of financing vehicle replacements in the unit, these vehicles have proven to be a serious drain of limited funds meant for community projects. With the possible exception of Munyamadzi, these vehicles are generally regarded as personal vehicles to the chief and there has been little attempt to maintain guidelines or controls over the use of these vehicles. As a result, in two cases (Chikwa and Mwanya), excessively high vehicle repair bills have been paid by the Sub-authority, thus draining the total funds meant for community development. In Mwanya, there is currently an outstanding bill of K11,000,000 and for Chikwa, K10,000,000, for community vehicle repairs.

In ADMADE's earlier years projects were supported mostly in close proximity to the Chief's palace. This pattern has begun to change over the past several years, with an increased proportion of projects supported in other VAG areas besides that of the chief (see Appendix I for maps and details on projects). This represents a positive trend that has been facilitated by training workshops, VAG elections and more recently, and adoption of a Community-based Constitution governing ADMADE procedures. As these new structures are put into place with clear legal requirements for a more transparent and accountable distribution of community revenues, this trend will almost certainly improve further.

#### Population growth projections

The ultimate challenge for CBNRM in Zambia is how to sustain continued natural resource production as local populations grow with improved living standards and better access to health care. As mentioned earlier, a number of areas are already dealing with human population pressures that seriously threaten CBNRM success in their areas. These areas usually correlate with favorable farming conditions (e.g. Bilili, Mumbwa) or poorly planned economic development (Lupande). In most other cases, human density is still low enough for CBNRM planners to be pro-active in dealing with the concerns of resource use conflicts caused by an increase in human numbers.

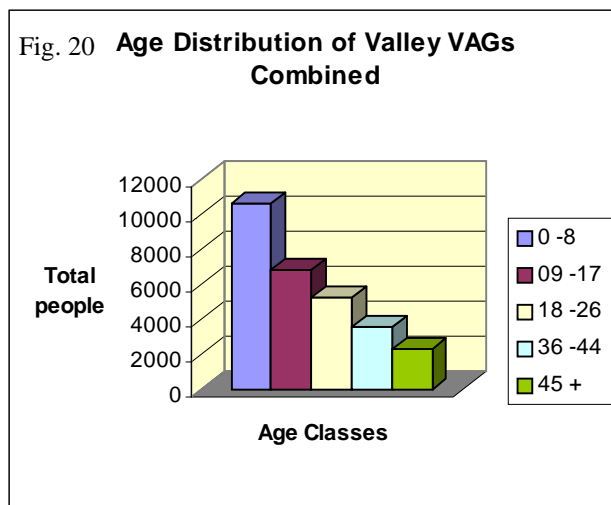
Based on a household to household population survey of 5 ADMADE units in Luangwa Valley, human populations are characterized by having a large, under 18 year-old age class (see Fig 20), representing about 55% of the total population (see Table 4). Population density for these areas vary from 2.5/km<sup>2</sup> to 4.6/km<sup>2</sup> (see Table 5). Despite these relatively low densities, nearly all of the valley populations are poised for rapid population growth on lands that are critically deficient of arable farmland. In February of this year, severe famine struck many parts of Mwanya unit where population density is greatest among the five areas studied. For most of February and into March, wild grass seeds was the basic food staple. Malnutrition as evidenced by swollen bellies of children was noticed as common by a visiting ADMADE officer. In addition, wildlife snaring reached high levels during this period, which even local residents confessed to.

This dilemma suggests that increased family size may not be advantageous for families living on poor soils or where farming is unpredictable.

Given that wildlife production does not require added labor to a community, communities living on poorer soils may find an incentive not to have large families by depending more on wildlife benefits through ADMADE. The critical question is whether ADMADE can channel benefits to households where food security is a major problem. From the previous section, such assurances are currently not possible, but clearly if CBNRM leadership is motivated to increase wealth from their wildlife resources, then targeting villages prone to famine with direct household benefits is an important step. Another important step is having locally available know-how and facilities for families to plan family sizes. As an indicator of community acceptance to the concept of family planning, ADMADE has introduced throughout these five ADMADE areas skills in family health and family planning, using social marketing techniques to distribute family planning education and drugs. Over the past twelve months, there has been a steady growth in acceptance to family planning, thus providing a hopeful foundation for long-term planning of human numbers.

Unit name	0 -8	09 -17	18 -26	27 -35	36 -44	45 +
Chifunda	2525	1466	1286	769	527	868
Chikwa	1360	776	821	510	323	173
Lower Lumimba	1287	743	555	499	234	417
Munyamadzi	2103	1579	1031	769	538	336
Sandwe	667	519	353	185	136	224
Upper Lumimba	2691	1775	1210	810	569	569
<b>Total:</b>	<b>10633</b>	<b>6858</b>	<b>5256</b>	<b>3542</b>	<b>2327</b>	<b>2587</b>
	34.1%	22.0%	16.8%	11.4%	7.5%	8.3%

Area name	Total population	Area (km2)	Population density (/km2)
Chanjuzi	9330	2555	3.7
Chifunda	7441	2104	3.5
Chikwa	6607	2426	2.7
Munyamadzi	7945	3177	2.5
Mwanya	7359	1587	4.6



## Fragmentation of human settlements in a GMA

Settlement patterns in a wildlife area can be an important variable influencing wildlife production in a CBNRM area and can also influence the success in delivering CBNRM benefits to the community stakeholders. The following are some general descriptive patterns of settlements in some of Zambia's GMAs as well as some conclusions that may serve future efforts in planning improved wildlife production in a CBNRM area.

Figure 21 below illustrates the current pattern of settlements in most of the ADMADE areas in Luangwa Valley. Data are based on satellite imagery and ground truthings for Chikwa, Chifunda, Chanjuzi, Mwanya and Munyamadzi areas. Linked to this figure is Table 5, which describes some of the features of these settlements. The Kafue GMAs are considerably different from those in the Valley, except for Mulobezi, whose settlements are also scattered and follow riparian soils. For the most part, settlements occur outside the GMA (Lunga-Busanga, Lunga-Lushwishi, Sichifulo, Nkala and much of Mumbwa and Kasonso) or have experienced large numbers of settlements with extensive land clearings (Bilili and parts of Mumbwa). Such large scale clearings have been associated with growing human populations and increased commercial farming practices supported by livestock and mechanized equipment.

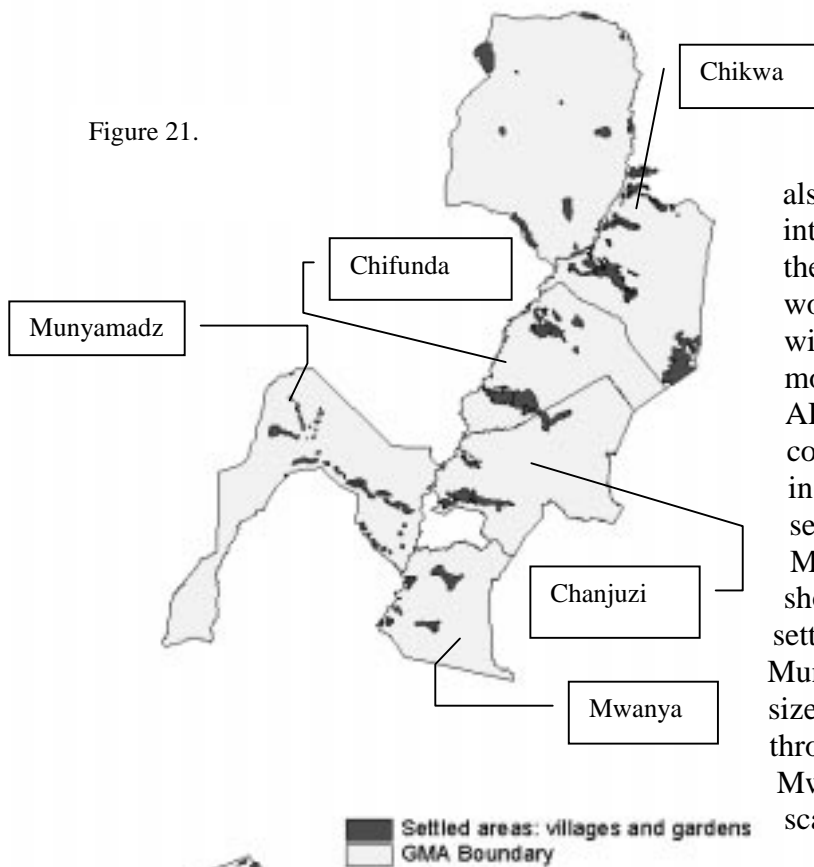
### a) Effects on wildlife production

As shown in Figure 21, settlements are generally linear, following stream banks that offer alluvial soils. Except for Mwanya and Chikwa, most of the settlements are relatively distant from the Luangwa River. Total number of discrete settlements vary considerably, ranging from 52 in Chikwa to only 8 in Mwanya (see Table 5 below) and with comparable variation in mean settlement size, ranging from 10.3 km<sup>2</sup> in Chanjuzi to 2.9 km<sup>2</sup> in Mwanya.

<u>Table 5</u> Name	Isolated settlements	Mean size(km <sup>2</sup> )	Total settled area (km <sup>2</sup> )	Settled area buffered 1 km	Total area (km <sup>2</sup> )	% of total settled
Chikwa	52	4.8	254		2426	10.5%
Chifunda	24	6.8	164		2104	7.8%

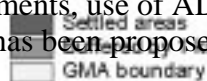
Chanjuzi	12	10.3	123		2555	4.8%
Munyamadzi	39	2.9	113	427	3177	3.6%
Mwanya	8	9.2	74	181	1587	4.7%

Figure 21.



While these patterns are most certainly influenced by soil constraints, there could also be appropriate CBNRM interventions that might alter these patterns in ways that would be more favorable to wildlife production as well as more favorable in providing ADMADE benefits to community stakeholders. For instance, a spatial analysis of settlement patterns in Munyamadzi and Mwanya show two extremes of settlement configurations: Munyamadzi has many small size settlements scattered throughout the area while Mwanya has fewer, less scattered bigger settlements.

Given that settlements are likely to expand, future growth of these two area's settlements can be modeled by a simple 1 km buffering around their existing boundaries. Results are shown in Figure 22 and provide a useful lesson for managing human settlements in GMAs. The total settled area in Munyamadzi increased by a factor of 3.8 whereas Mwanya increased by a factor of only 2.4 (see Table 6). Not only does Munyamadzi have greater fragmentation of wildlife habitats, but their total area allocated to residents will likely require more land over the long term than if settlements were more concentrated into larger, contiguous settlements. If local CBNRM leadership in Munyamadzi chooses to maximize wildlife revenues, then settlement patterns will need to be critically examined. Interestingly, a preliminary land use plan adopted by the community in 1998 calls for resettlement of households away from the Munyamadzi River to a more centralized location. ADMADE and Irish AID are combining resources to build wells and clear land to facilitate this resettlement, which the local leadership is doing to reduce wildlife conflicts in areas where buffalo and other species come to graze and drink water in the dry season. To promote and maintain improved agricultural production on land being designated for larger, more stable settlements, use of ADMADE funds to support self-sufficiency in food production has been proposed and is currently under review.



## b) Effects on ADMADE implementation

Distances between settlements vary considerably among the different areas shown in Figure 22. Such variation represents a potentially important variable for coordinating and disseminating ADMADE information in a community and therefore the level of involvement and participation by local residents. Local understanding and support of ADMADE would be expected to correlate with the compactness of the communities in a CBNRM area. A recent survey of snare collections supports this assertion. Significantly more snares were found around the outer-lying, remote villages in Munyamadzi than among the larger villages in Mwanya, even though Mwanya has had a prior history of snare. It has also been able to more effectively disseminate ADMADE awareness to its residents.

Village fragmentation is often caused by families seeking out certain natural resources that improve or satisfy household needs, e.g. access to a waterhole, game meat, honey, better soils and so forth. Traditionally, Chief's headmen supervise movements of people to new sites on communal lands, but there have been numerous occasions where the chief was found not to be aware of new settlements until significant land use problems had already occurred. Given the importance of land use issues to the sustainability of wildlife production and the objectives of CBNRM programs, traditional systems for monitoring settlements may need further technical assistance from ADMADE. This could possibly allow local leadership to more effectively monitor these problems and plan more wisely the future growth of their community. Simple GIS technology applications have been applied in various ways to support this process and such applications for improving CBNRM efforts to monitor and inventory land settlement patterns are now being taught by Nyamaluma Institute.

What should be stressed is that the Chief's have been exceptionally effective in resolving settlement conflicts where such conflicts threaten or seriously disturb the safari industry. Perhaps more than any other reason, the continued role of Chiefs in resolving land issues is an important variable in ADMADE's future success. Such decisions are made through traditional channels and these decisions are usually respected and accepted without serious retribution to the resource or to the stability of the community.

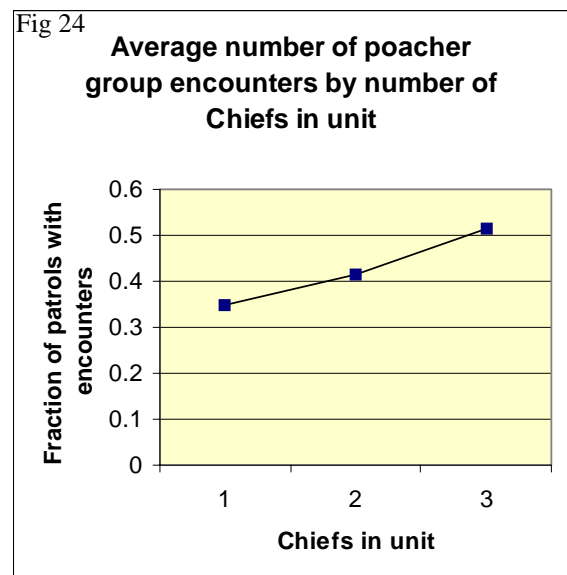
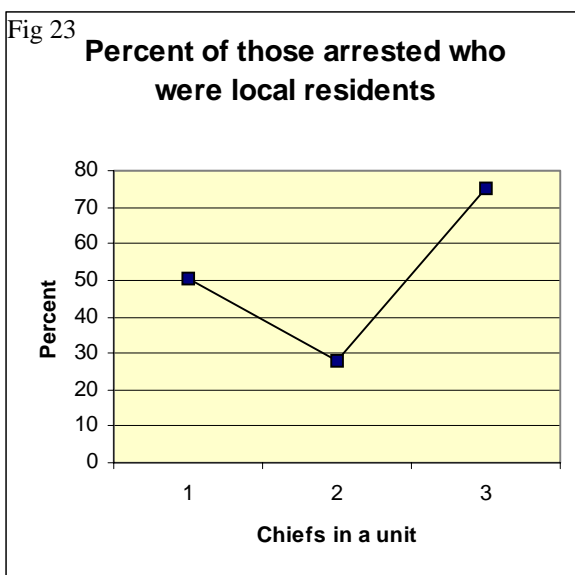
Measures that prevent such conflicts from arising are critical for CBNRM success, and while they include legitimate leadership roles of the chief, there are important and effective ways that well designed development projects can also reduce the effects of land fragmentation by new settlements. A number of variables are currently being proposed and planned at the community level through a series a land use planning workshops being facilitated by ADMADE/Nyamaluma. These variables include 1) water security and reduced conflict at waterholes: the financing of wells, 2) food security: electric fencing, fertilizer credits, early planning of food relief with ADMADE funds, improved agricultural practices, and improved road access and 3) alternative sources of income to reduce pressures on game meat as a commodity for bartering.

Number of traditional leaders associated with a GMA: lessons for CRB formation

In past years ADMADE leadership at the community level has been largely directed by the local chief of the area and has usually followed many of the traditional channels of administration local chiefs are accustomed to, including indunas and village headmen. The ADMADE experience has shown many examples of the positive value of how such traditional leadership impacts on a community for unifying and stabilizing community perceptions and commitment to locally determined policies. The liabilities of having sole dependence on chiefs for ADMADE leadership, however, in terms of financial management and ADMADE benefit sharing have been a primary factor in promoting increased democratization of ADMADE. As ADMADE continues to evolve its structures and systems of local governance through a coordinated leadership of Community Resource Boards and local chiefs, an important variable that may influence the success of this process is the number of local chiefs in a given CBNRM area. As the number of chiefs increase, the likelihood of certain problems affecting ADMADE's success for the entire community may also increase:

- a) difficulty in achieving consensus among the separate chiefs and their subjects
- b) increased support requirements for the chiefs at the expense of general community needs
- c) difficulty in enforcing land use decisions affecting the entire CBNRM area
- d) difficulty in balancing ADMADE benefits with development needs and management priorities.

These concerns are reflected with actual data on resource disturbance trends, shown in Figures 23 and 24 below.



Ideally, therefore, it may be advisable for ADMADE/CBNRM units to be at the Chief level. In most cases this is possible if the chiefs' areas involved are large enough to sustain a viable wildlife industry on their own. Such a situation arose between Chikwa and Chifunda. These areas were formerly combined as a single ADMADE unit in Musalangu East GMA. Conflict between the chiefs over revenue sharing and accusations over cross-border disturbances eventually resulted in the split of the two areas as separate hunting blocks. Each area is now accountable for their own hunting area and the revenues derived from them. CBNRM results in terms of consolidation of community efforts to support ADMADE have subsequently improved.

Such conflicts continue to occur in other areas, most notably West Petauke, where the two local chiefs have accused each other of violations of past agreements to control poaching. Dialogue between the chiefs has broken down over the past year and there is little evidence to suggest these two communities will be able to effectively work as a single CRB. Part of the problem may be the large distance that separates the chiefs and the infrequent occasions for them to discuss issues together.

Other areas where such conflicts have arisen in the past but with less severity are Chitungulu and Kazembe (Chanjuzi Unit), Moomba and Nyawa (Sichifulo), and local chiefs in Rufunsa. Overcoming these conflicts will be an important basis for ADMADE success in cases where individual Chiefs' areas cannot sustain a single safari operator. In these cases it may be necessary to develop a higher CBNRM authority to deal with land management issues while providing greater autonomy to individual chiefs' areas for leadership in meeting development needs.

#### Level of skills available within the community for administering and implementing CBNRM.

Developing the necessary skills for communities to implement ADMADE is likely to be influenced by at least three different variables:

- 1) level of skills and education in communities,
- 2) level of ADMADE training provided, and
- 3) caliber of skilled ADMADE practitioners working with communities.

##### 1) Level of skills and education in communities

The first variable is important in that it establishes a baseline of skills within the community for achieving resource management and community development objectives of ADMADE. The recent CRB elections recently concluded in four of the Luangwa Valley units clearly shows that people administering ADMADE in the recent past were not the most qualified or best educated people available in the community. Though Wildlife Management Sub-authority members were said to have been elected, not all of the community actually participated in these elections and as a result members were not necessarily representative of the whole community. There were many instances of people favored by the chief having a seat on the sub-authority and while loyalty to the chief is important for social stability, other people with possibly more educational and

professional background were excluded from the ADMADE process. Tables 7 and 8 below, together with Figure 25, show a sharp contrast between the caliber of CRB members recently elected in a democratically monitored election and those elected through the previous ADMADE leadership structure of Wildlife Management Sub-authorities.

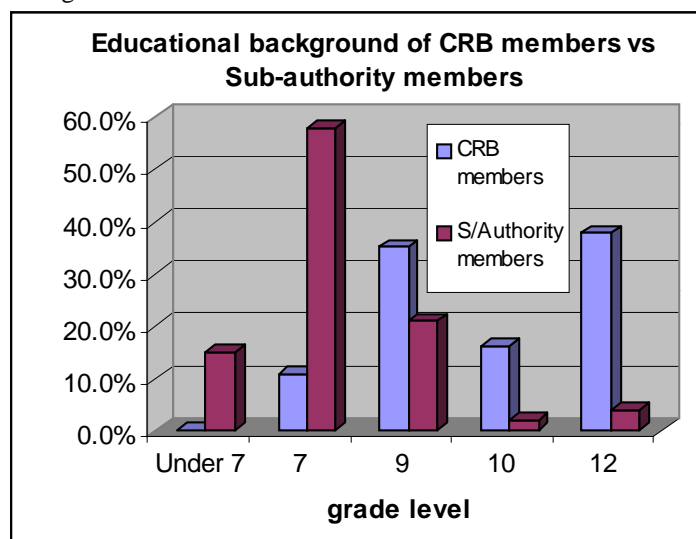
Table 7. Education of sub-authority members

	Below 7	7	9	10	12
Chanjuzi	2	5	5	0	1
Kazembe	0	8	2	1	0
Mwanya	5	4	1	0	0
Chifunda	1	6	0	0	1
Chikwa	0	8	3	0	0
Total	8	31	11	1	2
Per cent	15%	58%	21%	2%	4%

Table 8. Education of CRB members

Unit name	7	9	10	12
Chifunda		3	1	4
Chikwa		4	1	5
Upper Lumimba combined	4	6	4	5
Total	4	13	6	14
Per cent	10.8%	35.1%	16.2%	37.8%

Fig. 26



One important factor that helped bring about these results was an extensive pre-election awareness campaign. This helped to ensure that all members of the community were aware of these elections, procedures for nominating candidates, and when and how elections would take place. In addition, public meetings were convened to explain the new ADMADE structure and why these elections were needed to support this new structure. To improve the caliber of CRB members, minimum educational standards for candidates were set at grade 9 and grade 12 was required to be eligible for chair of the CRB. In contrast, educational standards were not preconditions for membership on Wildlife Management Sub-authorities. Another procedure used that enhanced election results was the manning of polling stations by Government workers to ensure residents were able to vote freely and privately.

Women's role in ADMADE has been relatively low and has caused concern with the need to involve more full participation by the community. The CRB election revealed some interesting results that may possibly explain the uneven distribution of participation by gender. Table 9 shows the total number of candidates who were nominated members from their respective VAGs. Of the 81 nominated and who contested, only 3 were women and of these only 1 was elected. In contrast, 43.7% of the total number who participated in the nominating process were women, suggesting

Unit	CRB candidates	Nominating supporters	
		Men	Women
Chikwa		24	182
Chifunda		19	166
Kazembe		19	194
Chitungulu		19	166
Total:	81	912	708
Per cent:		56.3%	43.7%

that women did not vote for their own gender for reasons not yet clear but most probably is related to the low occurrence of educated women who could meet the educational requirements. The single

woman who was elected worked as a professional secretary in ZCCM and has retired in her home village. If this hypothesis is correct, it shows the great need for women to be more actively involved at the VAG level where educational requirements are less stringent and to be more committed to improving educational opportunities for women in the village

Because of these more elevated standards of the CRB, it is hoped and expected that these democratically elected leaders will be far more capable of applying ADMADE methods and skills to support the resource management, financial management and community development needs of their area. Previously, a small but significant percentage of community participants who attended skills courses at Nyamaluma Institute were not sufficiently educated to fully benefit from the various courses taught. This lowered the likelihood of participants effectively applying what they learned to improve ADMADE results in their own areas.

## 2) Skills training provided to communities

### a) Local leaders

Despite the past problem of sub-authority members having a relatively low educational background, a total of 30 different courses were offered to both Sub-authority members and members of the various technical sub-committees, involving 393 participants from 1997 to 1998. Nyamaluma piloted its first community leadership ‘skills courses’ during this period in the Luangwa Valley where progress could be more closely monitored and costs reduced. This large discrepancy of community participants from Luangwa and Kafue GMAs who received ADMADE training from 1997 to 1998 (shown below in Table 10 with ‘x’ indicating unit was represented with participants) provides a useful basis for correlating indicators of ADMADE success with levels of community training.

Table 10

<b>Luangwa Units</b>	<b>CDC<sup>1</sup></b>	<b>FMC<sup>2</sup></b>	<b>RMC<sup>3</sup></b>	<b>Book Keeper</b>	<b>Chiefs leadership</b>	<b>Quota setting</b>	<b>Drama skills</b>	<b>Land use planning</b>	<b>Bee Keeping</b>	<b>Family planning</b>
Chikwa	X	X	X	X	X	X	X	X	X	X
Mwanya	X	X	X	X	X	X	X	X	X	X
Chifunda	X	X	X	X	X	X	X			X
Chanjuzi	X	X	X	X	X	X	X	X	X	X
Munyamadzi	X	X	X	X	X	X				X
<b>Kafue Units</b>	<b>CDC<sup>1</sup></b>	<b>FMC<sup>2</sup></b>	<b>RMC<sup>3</sup></b>	<b>Book Keeper</b>	<b>Chiefs leadership</b>	<b>Quota setting</b>	<b>Drama skills</b>	<b>Land use planning</b>	<b>Bee Keeping</b>	<b>Family planning</b>
Mumbwa		X	X	X		X	X		X	
Sichifulo	X	X		1999						
Mulobezi			X	1999	X					
Lunga										
Kasonso	X			X						

<sup>1</sup>CDC Community Development Committee

<sup>2</sup>FMC Financial Management Committee

<sup>3</sup>RMC Resource Management Committee

Table 11

Luangwa Units	Projects	Total \$ costs
Chifunda	23	68641
Chikwa	14	47092
Mwanya	18	55995
Chanjuzi	31	27903
Munyamadzi		
Kafue Units		
Mumbwa	11 (not well documented)	
Sichifulo	8 (not well documented)	
Mulobezi	2	28000
Kasonso	2 (not well documented)	
Lunga	3 (not well documented)	

The contrast in community development between these two regions (see Table 11) presents a strong testimony to the critical importance of training local leaders and ADMADE participants in CBNRM skills. In this table projects completed or still in progress since 1994 are listed.

Developing ADMADE’s training curriculum has been an adaptive process that offers skills that

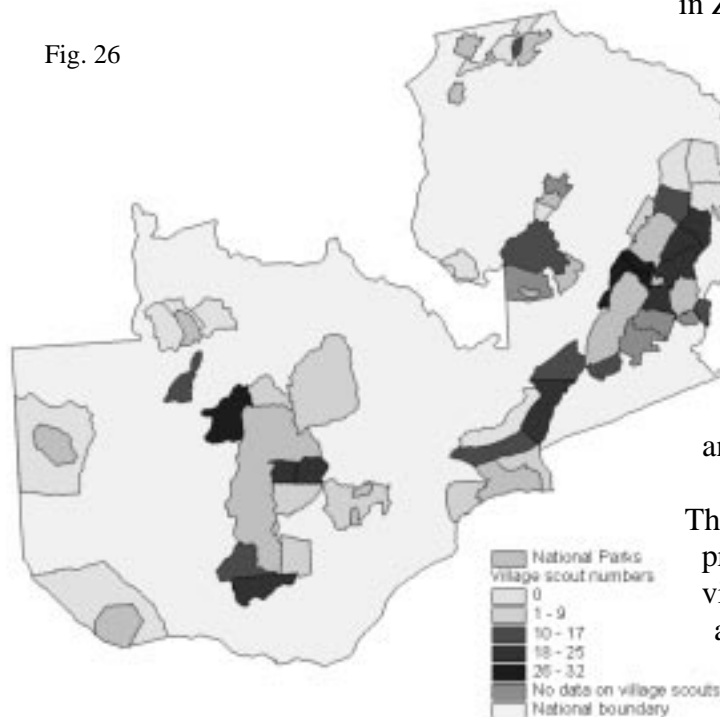
specifically support the ADMADE structure and the CBNRM needs communities most commonly have. As the structure itself changes, which normally happens in response to needs assessments and critical reviews of ADMADE performance, then adjustments in curriculum and training focus are made accordingly. Such an approach allows continual consolidation of ‘lessons learned’ into an advancing and more comprehensive curriculum. This procedure minimizes risks of confusing CBNRM participants with cross-conflicting skills and priorities for what is expected of them. A more complete review of the training program being offered to CBNRM communities is provided in the supplemental paper, ‘Reaching Out to Rural Communities’, which reviews in more detail how CBNRM monitoring, training, and results analysis are integrated to support CBNRM skills development in ADMADE.

## 2) Village scouts

Not all GMAs yet have village scouts, and in most cases this is because these areas have insufficient wildlife numbers to support a viable safari industry. In general these areas are referred to as under-stocked GMAs and account for over a third of the GMAs in Zambia. Village scout salaries are

supported entirely from ADMADE revenues, and without village scouts, GMA management and protection is almost exclusively dependent on the relatively few civil servant scouts who are stationed in the area. Figure 26 shows which GMAs in Zambia are currently being supported with village scouts and their total numbers.

Fig. 26



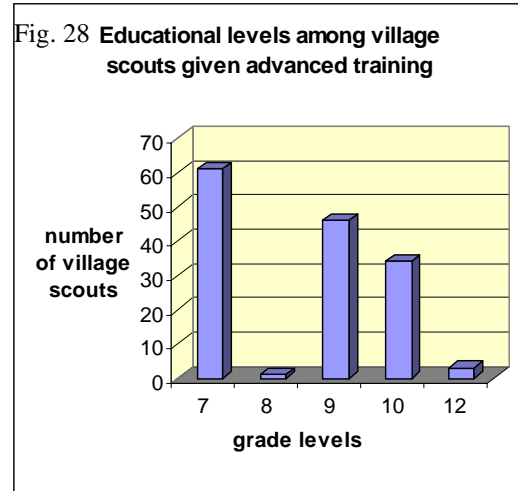
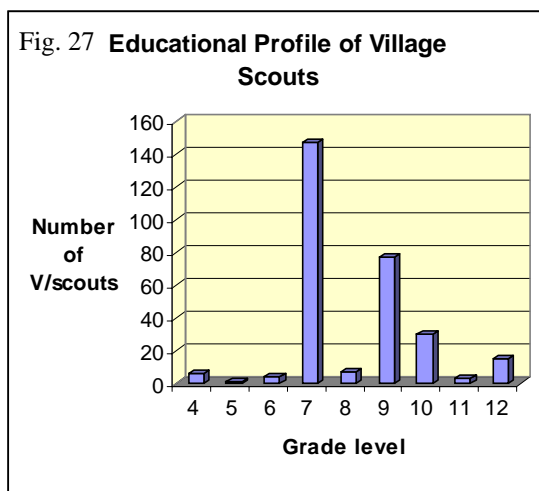
The following sets of information provide a useful profile of how village scouts, as a locally recruited and employed workforce, are

contributing to the wildlife management effort in Zambia’s game management areas.

*a) Educational background*

A key feature to ADMADE’s approach to wildlife management has been the reliance on local residents to manage, protect and monitor wildlife resources on their own lands. Village scouts, who are local residents, perform much of this work. Formal education is not mandatory to be eligible as a village scout, though minimal grades are required for village scouts to be allowed to perform certain duties, such as data collecting and monitoring of hunts. The primary objective of village scouts is to balance the need for local employment to discourage from poaching with the need to attract better educated people to learn advanced wildlife management skills.

Figure 27 below shows a frequency distribution of village scouts trained at Nyamaluma and their educational background. From personal interviews conducted with selected samples, it is estimated that not less than 30% of village scout recruits come with backgrounds in poaching or illegal hunting prior to their training. This points argues that a high proportion of village scouts have considerable knowledge of ‘bush lore’ and the habits of poachers in their area. The objective of their training at Nyamaluma is to put this knowledge to practical use for wildlife management.



Of this sample, continued advanced training is offered to those village scouts with a required education level and who show aptitude for the particular skills course being offered. Figure 28 above summarizes nine past advanced courses and the frequency of village scout participants by grade level.

ADMADE Unit	Most Recent	Pre-ADMADE
Chifunda	36	6
Chikwa	33	9
Kasonso	46	5
Lower Lumimba	47	18
Lunga combined	43	7
Mulobezi	20	4
Mumbwa	54	26
Munyamadzi	46	24
Sichifulo	37	16
Upper Lumimba	42	35
Total	404	150

*b) Contribution to management manpower*

With the introduction of ADMADE, the overall scout workforce has increased by a factor of approximately 2.7, as shown in Table 12 below. This increase

is based on the units listed for which data are most accurate and where ADMADE has been most active. The comparison is based on those scouts paid by Government (NPWS trained scouts and Civil Daily Employee untrained scouts) present in 1988 and the total scout workforce present in 1999. The latter figure equals the scout number supported with GRZ salaries and those supported by ADMADE generated revenues (village scouts, senior village scouts and assistance village scouts).

As was discussed in the USAID 2<sup>nd</sup> Quarterly Report, salary support for village scouts is about .3 to .5 the cost of a GRZ paid scout, though both contribute approximately the same level of patrolling effort per scout. Based on the fact that GRZ scouts must leave the unit to receive their salary cheque in town, the total amount of time a GRZ actually stays in the unit is presumably less than that of a village scout, who is paid locally by the community bookkeeper. This would allow village scouts greater time to participate in other duties expected of a village scout, such as crop damage control, community education and monitoring of hunts.

Staff Category	N	died	dismissed	resigned	retired	transferred	Total	Per cent
ADMADE	75	4	4	2			10	13%
GRZ	88	3	13	1	8	5	30	34%
1995 to 1999								
Staff Category	N	died	dismissed	resigned	retired	transferred	Total	Per cent
ADMADE	257	14	5	11	2		32	12%
GRZ	281	13	15	1	14	26	69	25%

Another important difference explained in Table 13 above is the higher loss rate of GRZ scouts as opposed to local village scouts. This difference might result in lowered work commitment for GRZ given that they have a greater chance of being transferred to another area. The higher replacement rate of GRZ scouts would also suggest they have less long-term knowledge of the area where they are serving as opposed to village scouts.

*c) Impact on patrol effort and area being policed*

The increase in total manpower has contributed to an increase in camp size and in some units an increase in number of camps. Prior to ADMADE there were no permanent records of patrol effort or results collected by scouts. An accurate comparison with current scout patrols in ADMADE areas is therefore not possible. However, if one assumes that scouts were patrolling with the same level of effort prior to ADMADE, then increase in camp size by employing local residents as village scouts would have

Fig. 29

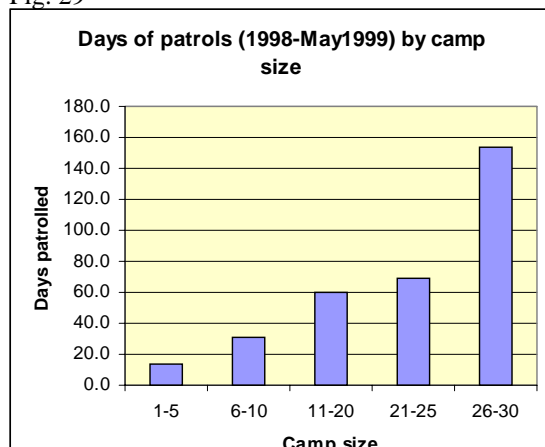
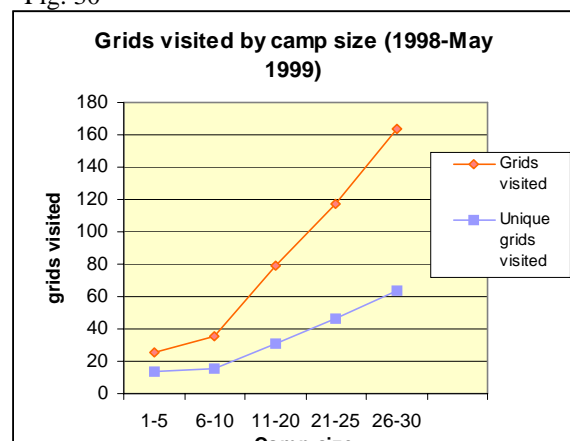


Fig. 30



had a noticeable impact on patrolling output. This is demonstrated in Figures 29 and 30 below. In both figures indicators of patrol effort (average total days patrolled by size of the camp the patrol originated from, and number of total grids and unique grids scouts visited on patrol by camp size) show increased patrolling effort as a function of camp size.

*d) Data collection and applications of data to wildlife management*

With the continued advanced training provided to village scouts by Nyamalauma Institute, village scouts have progressively improved their skills in CBNRM responsibilities, most notably civic education, resource monitoring, data collection, law enforcement, and public education skills. This training has been designed to broaden the role of the community in managing their natural resources and a review of how these skills are now being applied in ADMADE areas is presented in Table 14 below.

**Table 14 Outlining Important Management Skills Taught to Village Scouts and their Applications**

Training category	Results of training	Impact of training
Monitoring	1) Collection of hunting data  2) Recording of disturbances (patrols and hunt monitoring)	1) Increase revenue (e.g., payment for wounded animals, validation of licenses, etc.) 2) Data used for quota setting 3) Data on licensing abuse, assisting with design of new licensing system 4) Client data used for land use planning 1) Locations of fishing camps, poacher routes, new settlements, important waterholes, etc. recorded; information used for zoning and land use decisions 2) Impact of certain land uses leads to formation of better managed land use activities, eg. bee-keeping groups, which also lessens bushfires
Civic education	1) Improved local understanding of snaring and poaching effects on ADMADE income 2) Improved awareness on potential problems of new settlements 3) Improved awareness on value of wildlife and benefits thru ADMADE	1) Reduce local involvement in poaching and snaring  2) Increased acceptance to relocate villages 3) Reduced cultural barriers to implementing ADMADE
Law enforcement	1) Improved local understanding of Wildlife Laws 2) Improved sense of resource ownership promoted thru law enforcement by local residents 3) Collection of data on law enforcement effort and results	1) Reduction in poaching  2) Increased cooperation among local residents to provide information leading to arrests 3) Improved accountability of who is patrolling, useful to local leadership for supporting bonuses or contract extensions to village scouts 4) Improved information for assessing management effort for developing better management plans

*e) Economic impact of trained village scouts*

With the availability of better trained and qualified scouts to monitor both legal and illegal forms of wildlife use, there are now improved checks on possible sources of income loss caused by unethical hunting practices (e.g. not endorsing wounded animals on license) or possible errors in the issuing of licenses. In Table 15 below, data collected by village scouts on all safari clients who hunted in Zambia in 1998 shows the number of occurrences for individual areas where more than one animal was hunted on a single license. These data were used to identify possible cases of unlawful hunting or improper licensing procedures. Potential income losses are also reflected in this data.

Number over-used licenses	Number potentially unlicensed animals	Lost Value(\$)
3	3	\$2,200
8	9	\$6,800
1	1	\$600
10	13	\$8,200
9	9	\$6,100
6	6	\$4,650
37	41	\$28,550

With such information now available, investigations can be more easily conducted. This has helped to provoke a much needed debate on improving the safari licensing system.

A second source of possible revenue loss that village scouts are able to safeguard against is the under-reporting of animals wounded by clients. In 1998 there were only three instances officially reported; but based on interviews with the village scouts who monitored clients, the number was estimated to be 22. Assuming most were buffalo, an average license fee not paid for these animals was estimated to be \$700, or \$15,000 of lost revenues for the season. Part of the problem of under-reporting by the village scouts may have been due to lack of vigilance by the unit leader supervising village scouts, training itself, or unscrupulous professional hunters. This problem was identified by matching field data with village scout interviews and again shows the value of having local residents continually trained to improve wildlife monitoring in their area.

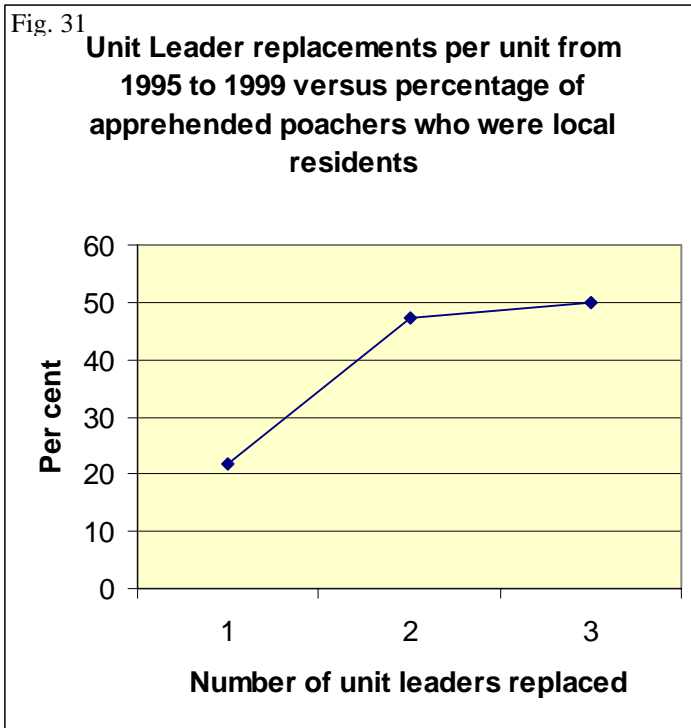
*f) Impact on public attitudes and ADMADE awareness*

While it is difficult to establish a direct cause and effect between the work of village scouts and subsequent changes in CBNRM attitudes among local residents, there are a few interesting trends that appear to correlate with increased efforts by village scouts to improve civic education in the community. In three areas where village scouts have organized drama groups to perform entertaining lessons on ADMADE, two have given rise to the formation of ‘reformed poachers clubs’, where residents who were once poachers have pledged not to poach and instead are encouraging their friend to stop as well. This has occurred in the Mumbwa and Chikwa areas. In a number of areas where Village Scouts serve as role models for their peers, there has been a significant increase among youths with backgrounds in poaching (eg snaring) working as Assistant Village Scouts. Such arrangements have been worked out in various ways to support the costs and have provided a useful base for recruiting future village scouts in these areas.

3) Caliber of skilled CBNRM practitioners working with communities

One of ADMADE’s most critical and useful CBNRM practitioners is the Unit Leader, who is an NPWS field officer chosen for leadership, educational level, and proven work ethic. A four to six month training in CBNRM skills is provided by Nyamaluma and in

most cases the candidate graduates as a Deputy Unit Leader. As a Deputy, the person is assigned to a unit where he or she works under a qualified Unit Leader until there is sufficient evidence to warrant the person to take up a unit on his/her own. Advanced trainings are offered annually to upgrade skills in CBNRM techniques and to review ADMADE performance in their respective area. Duties are varied and require skills in organization and planning to maintain work schedules for building CBNRM capacity in the community. These duties include village scout supervision, reporting on management issues to the Resource Management Committee and the CRB, management planning and budgeting with the community, monitoring wildlife uses in the area, facilitating quota setting meeting, and promoting a co-management relationship between the community and the private sector.



Unit leaders are relatively well monitored by Warden and Nyamaluma Institute and are usually removed from the unit if their performance is poor. Therefore, if unit leaders are playing an important role in achieving ADMADE success, then those units where unit leaders were not replaced should be associated with units where ADMADE is working well. The indicator used for this analysis is the percentage of people apprehended by scouts who are local residents. Communities having a successful ADMADE, if influenced by the leadership of unit leaders, should have the lowest percentage. Results

presented in Figure 31 are consistent with this argument.

There is also considerable anecdotal evidence to further support the important role Unit Leaders play in influencing ADMADE's success.

*Case Study: Mulobezi*

*The unit leader for this unit performed very well as a student at Nyamaluma and was deployed as a full unit leader to Mulobezi. Unfortunately, he was not well monitored and unknown to the Warden, senior NPWS officials and Nyamaluma was the fact that he and his village scouts were trafficking in game meat for at least a year. Mulobezi's performance during his tenure was extremely poor, with few tangible benefits realized by the community and below average results in patrolling effort by the scouts. Perhaps due to lowered expectations of ADMADE by the community, the chief has allowed new villages to encroach on potentially valuable wildlife areas.*

*Case Study: Chanjuzi*

*In late 1997 Chanjuzi suffered a financial scandal which subsequently led to the suicide of the resident unit leader. Ironically, the unit had a past reputation of being among the best managed CBNRM areas in ADMADE. The loss of the unit leader was in early January 1998 and he was not replaced until the end of the same year. During the interim the unit suffered a serious vacuum of administrative leadership for facilitating meetings and supervising the village scouts. Data were not collected, field patrols were infrequent, community liaison was poor, and a number of serious land use disturbances began to threaten the safari industry in the area. When a capable unit leader was eventually transferred to the unit, a dramatic change in village scout performance was noted, with three-fold increase in patrolling from the previous three months. The local chief was assisted by the unit leader to promote public awareness for the need to reduce land use disturbances. In addition, a very challenging task of removing 64 households from a wildlife sensitive area was successfully carried out.*

A key lesson to the development of the unit leader's position is that their role needs to be fully recognized and supported by their supervising officers. From recent interviews, some unit leaders feel their wardens do not fully understand or appreciate the complex nature of their work in assisting communities to adopt CBNRM practices. As a result, they are not always given the support they need. A key requirement to a unit leader's success is that he be given the level of autonomy to exercise his skills as a CBNRM practitioner. Otherwise, community leaders will likely judge him as a government worker concerned more about pleasing his immediate supervising officer. The Luangwa Command, for instance, has demonstrated a very favorable working relationship between the Warden and the Unit Leader. Unit Leaders are given full freedom to pursue community-oriented workplans in support of ADMADE objectives with little interference from the Warden. Periodic meetings are convened where unit leaders brief the warden on their results, and unless results are poor, encouragement and continued support is provided by the warden.