



## Use of woodland resources within and across villages in a Zimbabwean communal area

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Accepted in revised form April 20, 2000

**Abstract.** A topical issue in natural resource management is that of scale, in particular, the organizational entry-point to community-based systems of natural resource management. This study investigated access to woodland resources from the perspective of the relevance of units (traditional villages) enjoying policy attention and the nature of boundaries of resource management units as espoused in academic debates. The relevance of the boundaries was investigated from the perspective of flow of resources across boundaries of the recommended units, and resource use relations among communities residing in contiguous units. The study used questionnaire surveys, informal interviews, and personal observations to explore woodland resource use patterns within and across the villages. People acquired woodland products from both within their own villages and from adjacent ones. Most people extracted resources from within residence villages but varying proportions of the people extracted various products from other villages. In general, members of the ruling clan – those holding exclusively ancestral beliefs, those with traditional main house types – were more likely to acquire resources from neighboring villages. People extracted lighter products like wild fruits, mushrooms, and medicinal herbs from other villages compared to bulkier products like fuelwood, kraal (cattle pens) and fence posts, wall and roof poles, and brushwood. The main reasons why people did not extract woodland products from other villages were availability of the products in their own villages, the long distances to walk to gather the resources from other villages, and, to a small extent, availability of substitutes and exclusion to some products by members of other villages. Overall, people did not deny woodland resource users from other villages access to resources in their own villages, although this applied less so in the case of extraction from areas under ritual designations or extraction for commercialization. The study argues that instead of aspiring for “hard” or “distinct” boundaries, policy needs to recognize “diffuse and soft” product use boundaries as a given, so as to promote resource management formulations/options that are more in phase with the operational contexts.

**Key words:** Boundaries, Local natural resource management, Resource use units, Traditional village, Woodland products

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### Introduction

A topical issue in natural resource management is that of scale, in particular, the organizational entry-point to community-based systems of natural resource management (Fox, 1992; Dovers, 1995; Rhoades, 1997). Whilst communities may be considered as the appropriate units (organizations) for natural resource management (Murphree, 1991), there is a general lack of clarity, at the operational level, of what the term “community” really means, or where a community starts or ends (Rhoades, 1997; Toh-Kyeong et al., 1998). A common assumption is that natural resource management communities are congruous with admin-

istrative units at the sub-district level (Martin, 1986). The assumption is confounded by the multiple (political, social, spiritual developmental) and dynamic nature of units exercising administrative functions at the sub-district level (King, 1994). In spite of the ambiguities surrounding the issue of scale in community-based systems of natural resource management, scholarly attention on the issue provides some instructive insights. Such insights have largely been inspired by two critical considerations – an equity consideration, which focuses on the question of apportionment of net benefits of resource use – and, an efficiency consideration, which is associated with the quest to reduce transaction costs.

Use of resources normally entails costs and benefits. In the interests of allocative order, such costs and benefits have to be distributed across a variety of actors (owners, users, managers of the resource) in a manner that enhances accountability in natural resource use on the part of all actors involved. The apportionment of costs and benefits should be such that it provides incentives to discourage any of the parties from over-investing in the appropriation of benefits whilst under-investing in the management (costs) (Berkes and Farvar, 1989; Ostrom, 1990). An attractive ideal is to internalize the costs and benefits of resource use – in other words – having those who own the resource being the users and managers of the resource (Murphree, 1991). In practice, however, the question of units of cost, ownership, benefit, management, and use has to be considered within the context of complex institutional geographies in which there are multiple (local and non-local) owners, managers, and users of resources – often with multiple, overlapping, and competing claims to resources (Rhoades, 1997).

Organizing for common management of resources invariably involves costs associated with organizing and these costs are expected to increase with increasing size of the management unit (Ostrom, 1990). An important consideration, therefore, becomes that of identifying the “lowest accountable units” of resource management. Natural resource policy analysts generally agree that these lowest accountable units should be “small” in size (Berkes, 1989; Ostrom, 1990; Murphree, 1991). Small units are associated with greater social cohesion, which allows for informal peer pressure to provide more cost-effective ways of fostering collective action, thus lowering transaction costs. There is, however, no consensus on how small the lowest-accountable units of local resource management should be. Variability of setting often compels that “small” be conceptualized within the context of local ecological and socio-political constraints (Murphree, 1991).

In addition to exercising scholarly interest, the issue of scale has posed, and continues to pose implementational and policy challenges in Zimbabwe as is evident from experiences from CAMPFIRE program. The CAMPFIRE program<sup>1</sup> is based on the concept of the “producer community” – held as the basic unit of social organization through which communities can be empowered to manage local resources (Peterson, 1991). Explicit in preliminary program designs was the need to focus on institutions at the sub-district level as the “producer communities” (Martin, 1986). In regard to the program’s implementation, however, history reflects fuzziness of scale and institutional (organizational) focus. The village development committees (VIDCOs) and ward development committees

(WADCOs),<sup>2</sup> which were demographically defined, were almost invariably considered as the producer communities. This could have been done to ensure that the program was in tune with government policy at the time. In terms of focus, the program has variously been implemented at the levels of VIDCOs, WADCOs, or even entire districts (Peterson, 1991).

The question of appropriate institutions for local natural resource management was also a key term of reference to Zimbabwe’s officially sanctioned Land Tenure Commission (Government of Zimbabwe, 1994). A key finding of the Commission was that traditional villages, which are under village heads (*masabhuku*), and not VIDCOs or WADCOs, were the legitimate and appropriate institutions for local natural resource management. The Commission recommended that the villages be given exclusive legal authority over resources within their own boundaries. The recommendation appears to be in tune with academic debates and insights on units of natural resource management at the local level. For instance, among the key features identified by Ostrom (1990) as being of utmost importance in the design of long-enduring institutions in effective communally-based systems of natural resource management is the need for clearly defined boundaries. The boundaries must define individuals or families who have rights to withdraw resources from the system as well as boundaries of the system.

The above recommendation of the Land Tenure Commission has far reaching implications on CAMPFIRE’s principle of the producer community and resource acquisition relations among villages in general. Evidence from recent studies appears to suggest that administrative and resource use boundaries are mismatched. For instance, in a study conducted in the Zambezi Valley, Lynam et al. (1996), showed that the sizes of areas from which resource are extracted vary markedly among households. The areas varied from as small as 0.2 km<sup>2</sup> to areas as large as 34 km<sup>2</sup>. In addition, most households were found neither to observe village nor ward boundaries in their resource use activities. In spite of its broad and extended nature, the study by Lynam et al. (1996) did not consider aspects of differentiation and resource use relations (whether amicable or antagonistic and why) among people in the administrative units depending on each other’s resources.

The aims of this study were to investigate how resource use relates to current spatial units (traditional villages) and to investigate the reasons for non-use of resources within and across villages. Subsidiary aims of the study were to investigate differentiation in use of resources within and across villages, and resource use relations among people residing in different villages.



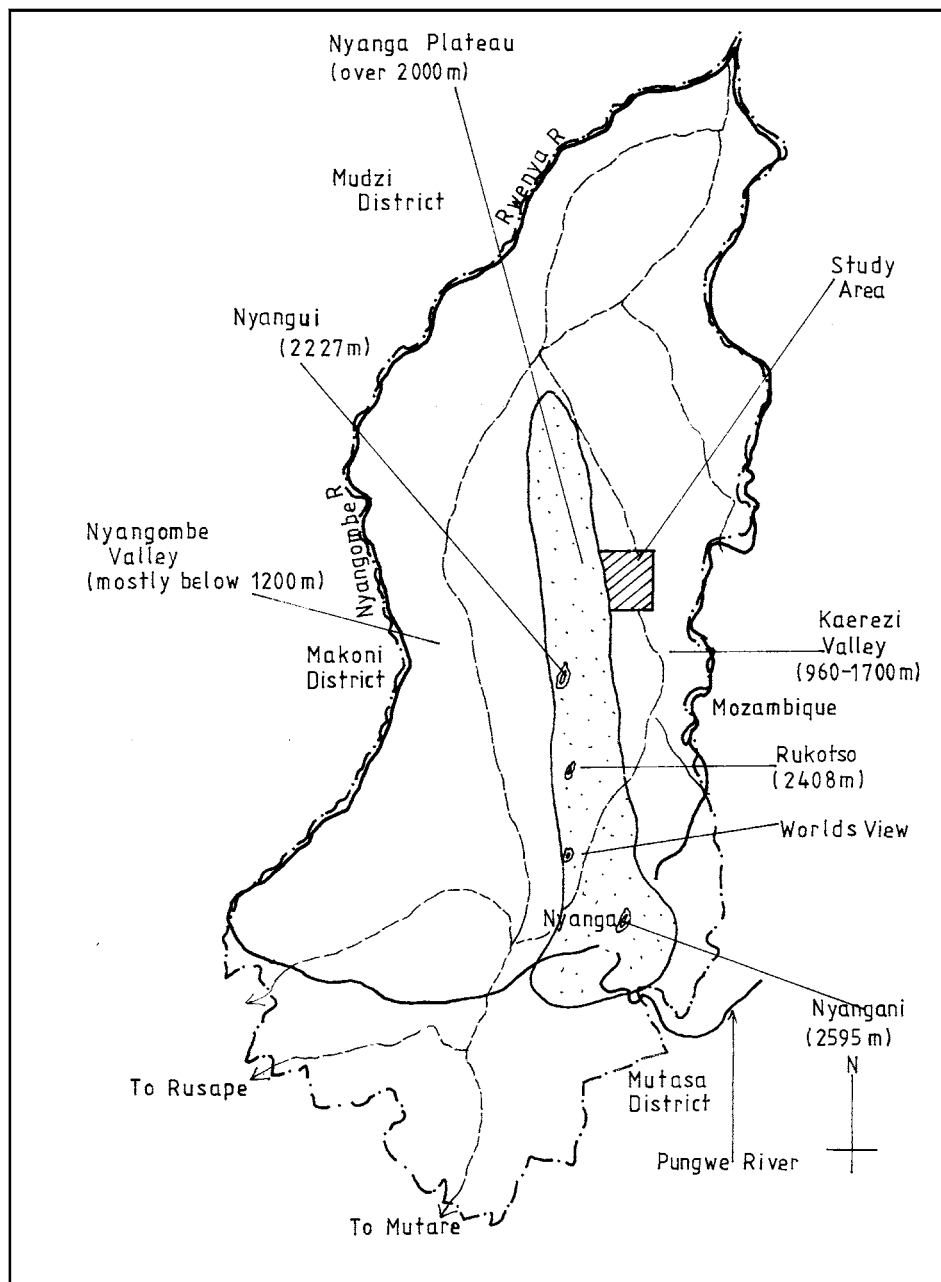
**Figure 1.** The location of Zimbabwe in Southern Africa, and of Nyanga District in the Manicaland Province of Zimbabwe.

An underlying theme of international relevance was whether clearly defined user groups and boundaries identified as being essential for effective common property regimes apply, at least from the perspective of units appearing to enjoy policy attention in Zimbabwe – traditional villages. The decision to focus on traditional villages and not VIDCOs was based on three factors. Firstly, by investigating the relevance of units recommended by the Land Tenure Commission's findings, the study contributes to an emerging policy issue. Secondly, by focussing on traditional villages, the study is in tune with policy trends, since there are moves by the government to re-empower the traditional leadership. Lastly, the VIDCOs themselves appear to have disappeared in the area whilst customary institutions still appear to be quite strong (Matowanyika, 1991).

### Study area

The study was conducted in Nyamaropa Communal Area, which is in Nyanga, a district lying along Zimbabwe's eastern border with Mozambique (Figure 1). A wedge of highland (the Nyanga Plateau), mostly above 2,000 m and spanning the central parts of the district, dominates the relief of the district. The Nyanga Plateau is bounded by two valleys, a wide one to the west and a narrower one to the east. The study area, which comprises 110 km<sup>2</sup> of land centred on 32°53' east and 17°52' south, is located in the eastern valley (Figure 2). The area is characterized by broken country interspaced with narrow to relatively wide valleys.

Nyamaropa experiences a tropical savanna climate; strong seasonality (wet summer and dry winter) with



**Figure 2.** The location of the study area, Nyamaropa, within Nyanga District.

constantly high temperatures (Goldstein and Sarmiento, 1985; Walker, 1985). Mean annual temperatures range around 20–22 °C, with October being the hottest month (mean maximum of 27 °C) and July the coldest month (mean maximum falls to 17 °C) (Brinn, 1987). The area lies in Natural Region IIb, an agro-ecological zone marking the limits of the dryland cropping zone, receiving mean annual rainfall of 600–800 mm (Vincent and Thomas, 1960).

Nyamaropa mainly lies on a Basement Complex matrix of granites with considerable intrusions of

dolerite sills and dikes (Stagman, 1978). Nutrient-poor soils of granitic origin cover much of the area (Grant, 1976; Brinn, 1987), and these are mainly used for dryland cropping (mostly maize for subsistence) by the local communities (Agritex, 1987). The vegetation of the area, mainly comprises of miombo woodlands on mountain and hill slopes and *Terminalia-Combretum* vegetation in the lowlands – with both components reflecting considerable human influence.

The population density of the area based on the 1992 census was approximately 22 persons/km<sup>2</sup>

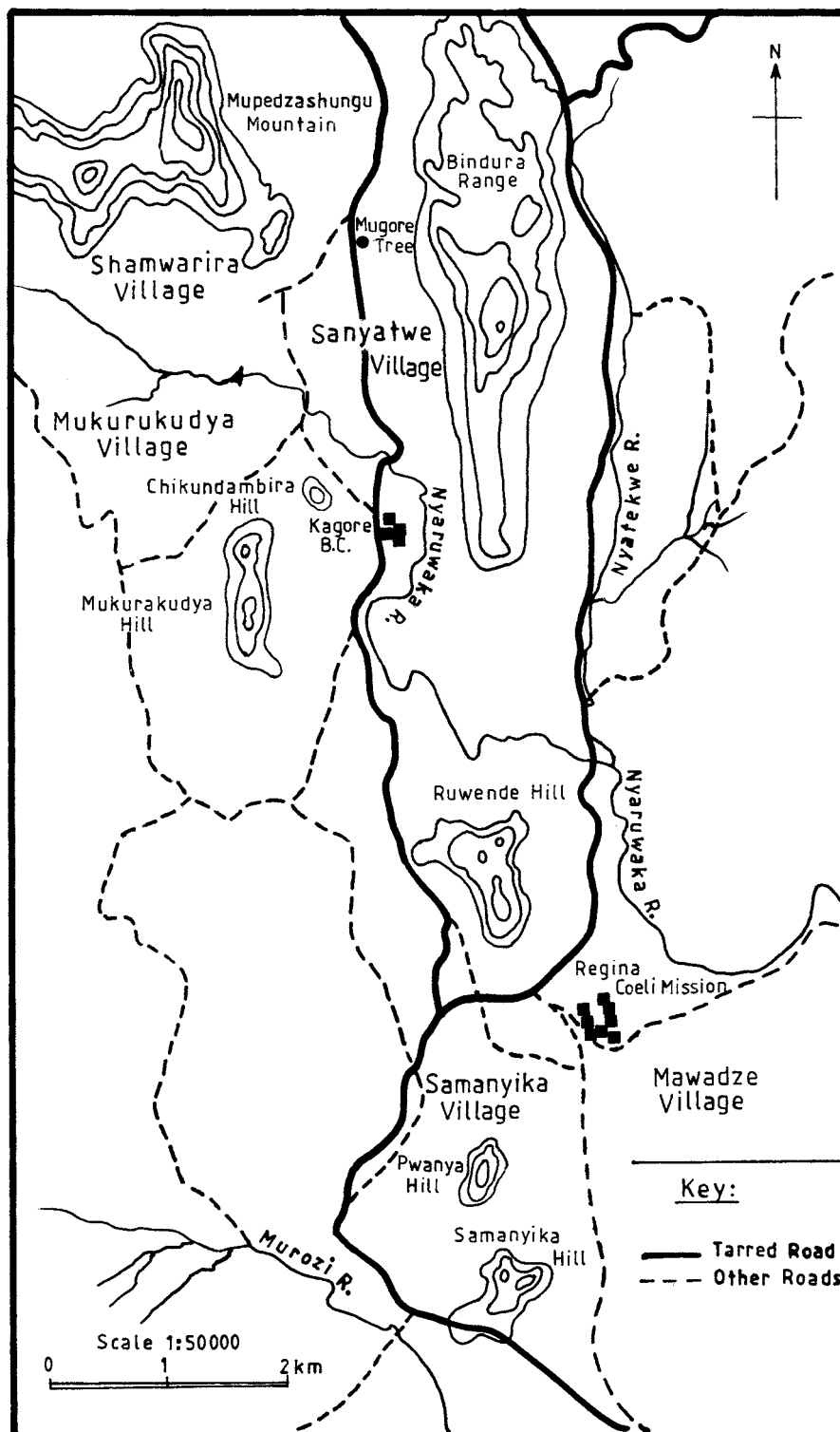


Figure 3. Part of Nyamaropa communal land which was covered by the study.

(Central Statistical Office, 1992). Much of the settlement is confined to a band of land between the 1,040 to the 1,100 m contours, this coincides with foot slopes of local hills and mountains, along which most of the households are clustered in a roughly linear pattern (Surveyor General, 1985). This pattern of settlement is mainly a result of landuse planning interventions conducted in the communal areas of the country under the Land Husbandry Act of 1951 (Beinart, 1984; Phimister, 1988; McGregor, 1989). The land tenure system includes individual fields and homestead plots within which much of the vegetation has been cleared, except fruit trees and trees of spiritual significance (Wilson, 1989). Beyond the individual homestead plots and fields lie the grazing/woodland commons, from which most of the woodland products are sourced. Arable landholdings average about 2 hectares per household.

The indigenous people of the area are part of the Shona, and fall under a variety of clans (Gelfand, 1974; Beach, 1980). The largest of these groups is the Unyama clan of the *mheta* (python) totem under Chief Sawunyama. This apical clan of longest known residence in the area has overall secular and religious (ritual) power and it exists side by side with a number of clans who arrived in the area after the Unyama clan. Among the latter are the Sakarombe and the Sanyatwe clans of the *shumba* (lion) totem who were moved into the area after being evicted from the well-watered southern parts of the district. This occurred during the colonial alienation of land in the 1940s and 1950s (Matowanyika, 1991). Social structures of incoming clans remained intact as they were settled separately in distinct areas of Nyamaropa. Some portions of Nyamaropa had to be cleared (by colonial administrators) of original settlers to create space for the in-migrants. The in-migrant clans therefore exercise secular and religious power in their own areas but at a broader scale they fall under the spiritual and political domain of the Sawunyama clan. There is co-habitation in some areas, especially in areas like Mukurakudya village, where the old groups refused to make way for the incoming groups.

## Methods

A questionnaire survey ascertained resource acquisition patterns within and across villages and the reasons for using or not using resources from other villages. The questionnaire was applied to a random sample of 40 households within each of five villages giving a total of 200 households. The 200 households gave a sampling percentage of 42%, out of 476 listed households, which had been compiled during preliminary

activities. The household survey covered the following villages: Samanyika; Mawadza; Sanyatwe; Mukurakudya and Shamwarira (Figure 3). Access to resources and use of resources, especially in areas where in-migration has resulted in mixing of various population segments, is often strongly differentiated along ethnic lines (Berry, 1993; Marindo-Ranganai and Zaba, 1995). Households also receive different resources from a variety of ecologically contrasting sites (Campbell et al., 1997). The need to capture biophysical and institutional (political organization) variation were, therefore, major considerations in the selection of villages in which households surveys were conducted. The Samanyika and Mawadza villages have relatively more sparse woodland, with the former village having a village head of the chiefly clan while the latter is presided over by a village head of the in-migrant clans (Mandondo, 2001). The other three villages lie in relatively more well-wooded landscape in the northern parts of the study area. Mukurakudya village is presided over by a village head of a non-chiefly clan of longer residence in the area, with the other two villages having in-migrant clan village heads (Mandondo, 2001).

Rural livelihood activities, including woodland use and woodland management activities, are also often variously correlated with other factors, with the following being among those most commonly reported: gender (Berry, 1989; Fortmann and Nabane, 1992); asset endowments like cattle, oxen, and ox-cart ownership in the case of Zimbabwe (Jackson, 1989; Muchena, 1989); educational levels and length of residence in the area (Nhira, 1994, 1998); type of main house at the homestead (Price, 1994); and, socio-economic status (Shipton and Goheen, 1992; Price and Campbell, 1998). A subsidiary aim of the study was to investigate differentiation in patterns of use of woodland resources within and across villages. The above variables, for which differentiation is most commonly reported, were among those included in the questionnaire as socio-economic descriptors of respondent households.

Most of these descriptors were assessed in relation to household head. Sex of household head was either male or female, with female-headed households being considered those run by widows, divorcees, and female single parents (*vakazvarira panze*). Age of household head was classified into young (<25 years), middle-aged (25–50 years) and elderly (>50 years). Clan membership and length of residence were included to get insights on ethnicity-related issues. Clan membership was based on totem (e.g., chiefly totem or other totems). Length of residence of clans in area was classified into those of longer residence – (i.e., those who lived in the area before the influx of in-migrants

associated with colonial land alienation), and those of shorter residence (for the in-migrants and people who settled in the area at a later date). Religious affiliation was divided into three categories – Christians, those believing in ancestral spirits and those practicing both Christian and customary practices. Main houses (those used as bedrooms) of brick under asbestos or corrugated iron sheeting were considered as modern main house types with the other types being considered traditional main house types.

Valuation studies in Zimbabwe and elsewhere suggest that subsistence values of woodland products in rural household economies are quite sizeable in comparison to annual cash income (Campbell et al., 1991; Clarke et al., 1996; Cavendish, 1997; Campbell et al., 1997). The household survey to the present study included products like fuelwood, wild fruits, and various types of poles, which were among those found to be most important to households in terms of contribution to total value (Campbell et al., 1997). The survey also included other minor products, like brushwood (tree branches or shrubs arranged in a row to provide fencing), mushrooms, medicinal herbs, and tree-bark ropes.<sup>3</sup>

Key informant interviews were also held in each of the villages to understand resource acquisition relations among villages in relation to the recommendations of the Land Tenure Commission. The interviews included a resident headmistress of Samanyika primary school, a field-based agricultural extension officer, village heads of all the five villages, and the councillor of the Kagore area. Informal discussions were also held with several other villagers in each of the five villages.

### Data analysis

Survey data were largely in categorical form. The study used  $\chi^2$  analyses to test the significance of association between the categorical variables. Comments relating to differences in relative woodland cover between the northern and southern parts of the study area were based on the researcher's own broad assessments. An open-ended question was used to record the reasons for non-use of woodland products from residence or other villages and the reasons were then post-coded into classes for analysis.

## Results

### *Local perceptions of rights to resources across villages: A broad overview*

Preliminary discussions with villagers on the implications of the recommendations of the Land Tenure Commission found that local natural resource management rules cannot easily be dichotomized into those pertaining to use of resources within or across villages. In general, local (socio-cultural) rules considered elsewhere (Mandondo, 1997), appeared to commonly apply in all the villages studied. The broader salience of rules could be attributable to any or all of the following factors: people in the study area are generally familiar with each other due to geographical proximity of the villages; the villages considered all fell under one chief (Sawunyama); and, close kinship ties which have resulted from inter-marriages across the villages.<sup>4</sup> The overwhelming view in most villages was that one could enjoy conventional access rights to resources, regardless of one's village of origin, as long as one was well-known by the people in the source villages. Conventional access rights were taken to exclude commercial extraction and acquisition of resources from sacred areas, both of which were roundly condemned by most informants.

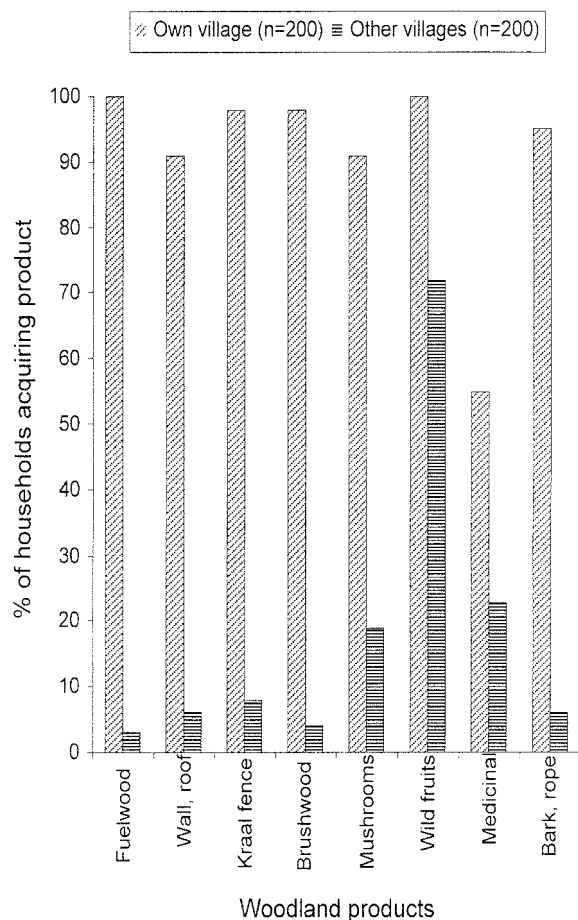
The majority of informants in Mukurakudya village, however, resented the presence of cattle from adjoining villages in their area. The village provides a route (*gwara remombe*) along which cattle are driven up the Nyanga Plateau in summer to avoid the burden of herding (a practice known as *kusairira*). Some of the cattle roam back (*kurunza*) into the lowlands and pillage crops, especially in Mukurakudya village. Issues of access to grazing resources, nevertheless, fell outside the scope of this study and will not be considered further. Local hills and mountains were mentioned as the common sources of most of the products considered in this study, except wild fruits, which were reported to be available from most parts of the local landscape. Most people indicated that they acquired such resources across villages if the hills and mountains lay close to their homes.

### *Patterns of use of resources within and across villages*

Questionnaire data showed that although villagers primarily depended on resources from their own villages, they also acquired woodland products from other villages (Figure 4). The proportion of households acquiring lighter products – like wild fruits and mushrooms – from other villages was markedly higher than that of households acquiring heavier products – like fuelwood, wall and roofing poles, kraal (cattle

**Table 1.** Substitutes and alternatives for products not acquired by some households from their villages of residence.

| Woodland product       | Substitute and alternative used or preferred                                                                                                                                                          |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wall and roofing poles | Brick or stones for walls, purchased timber for roofs                                                                                                                                                 |
| Kraal and fence posts  | Rubber hedge, sisal hedge, brushwood                                                                                                                                                                  |
| Brushwood              | Rubber hedge, sisal hedge, wood pole palisades, wire fences                                                                                                                                           |
| Medicinal herbs        | Reliance on modern medicine from clinics and hospitals, reliance on faith healing                                                                                                                     |
| Mushrooms              | Exotic vegetables, meat, edible caterpillars and other indigenous vegetables used as relish, which is consumed together with the staple diet of <i>sadza</i> , a thick porridge made out of corn meal |

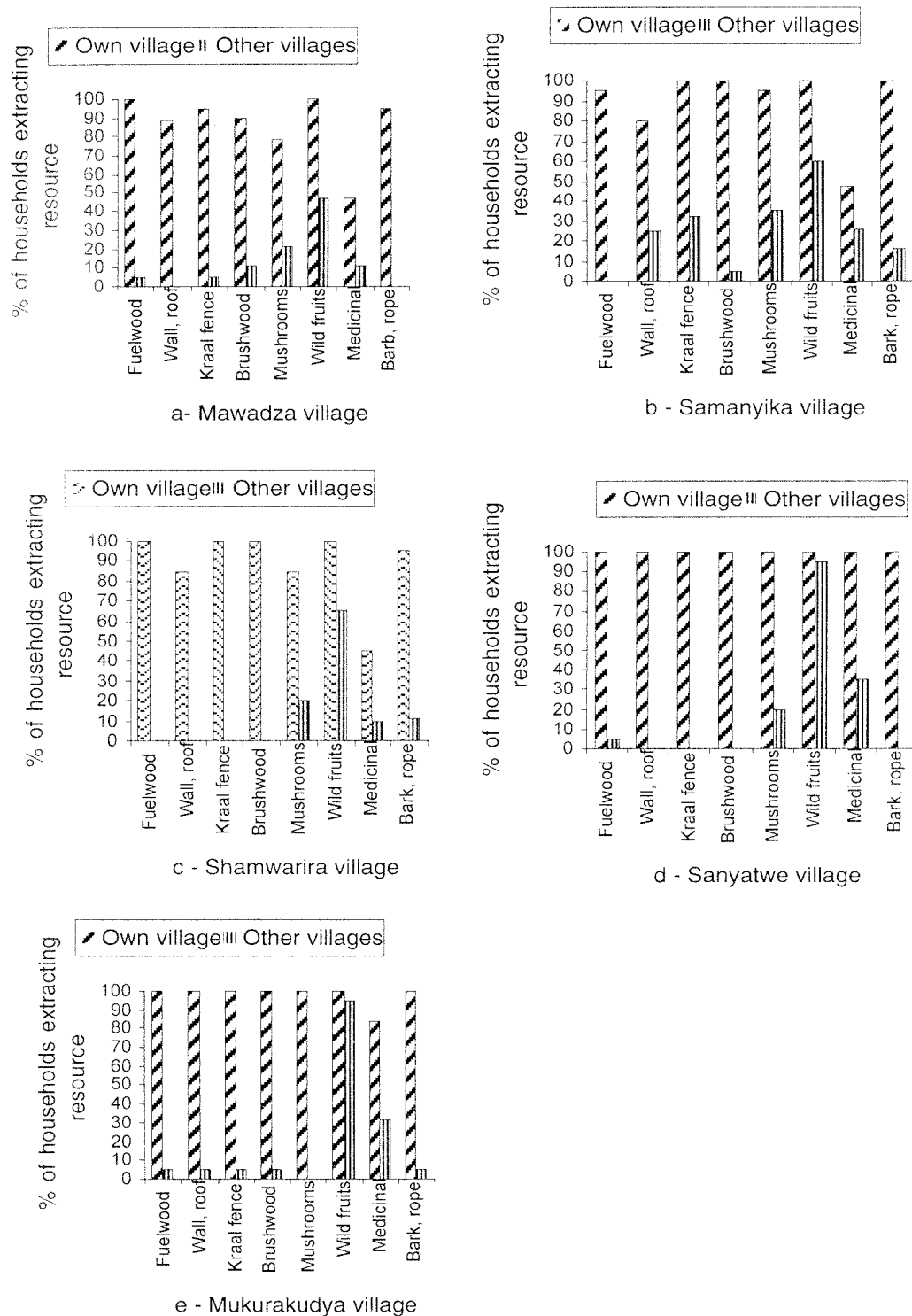
**Figure 4.** Patterns of acquisition of woodland products within and across villages in Nyamaropa. (Note: percentages for a resource add up to more than 100 because some households acquire resources from both their villages and from surrounding villages.)

pens) and fencing posts, and brushwood – from other villages (Figure 4).

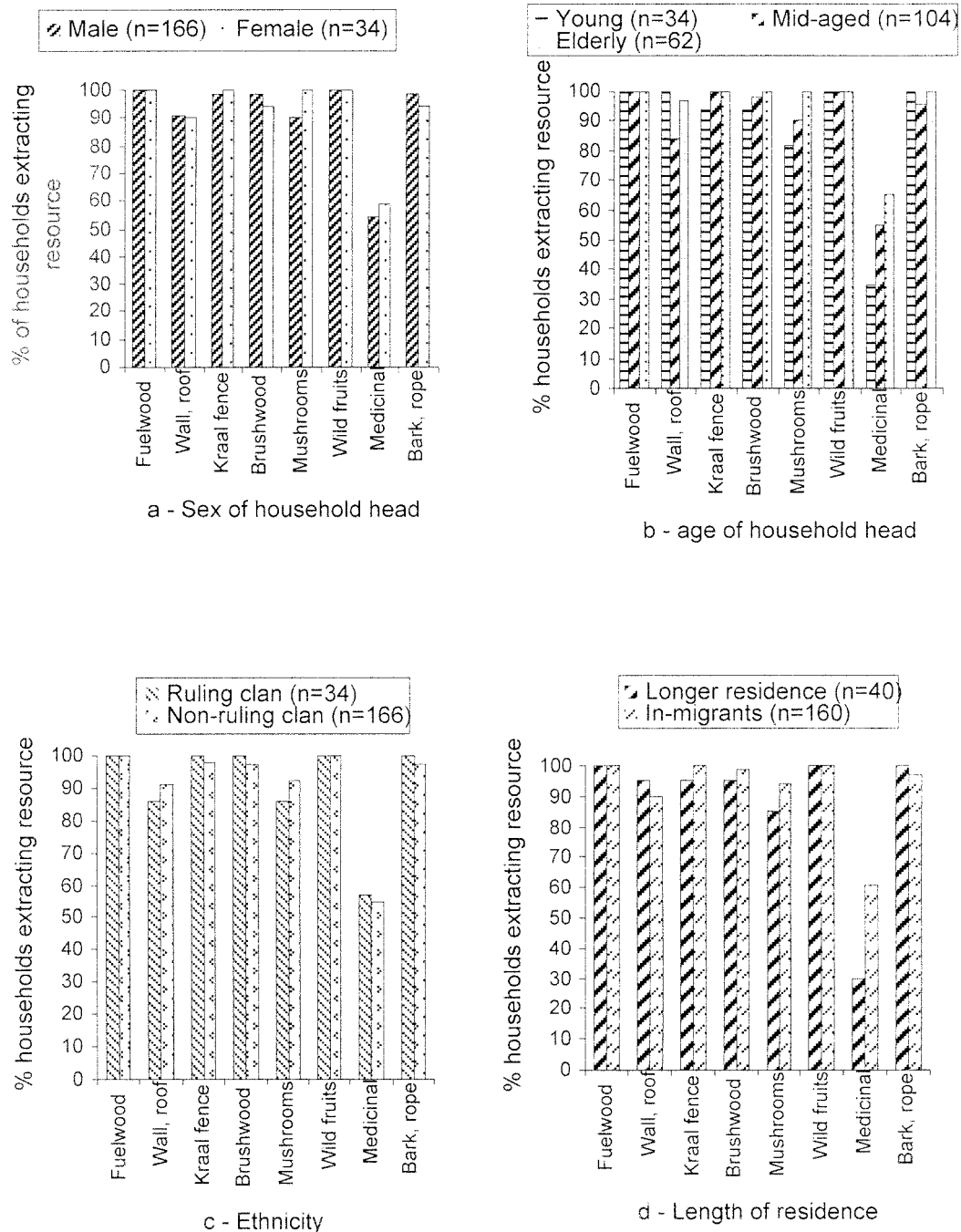
All households used fuelwood and wild fruits acquired from residence villages whilst only very few households (less than 12% in each case) did not use wall and roofing poles, kraal and fence posts, brushwood, mushrooms, and tree-bark rope from residence villages. Markedly more households (44%) did

not acquire medicinal herbs from residence villages. The commonest reasons cited by most (90%) of the few respondents who did not use wall and roofing poles, kraal and fence posts, brushwood, and tree-bark ropes from residence villages were non-availability of these products and long travel distances to access the products – which forced them to opt for substitutes (listed in Table 1). Although the above reasons also applied for non-use of mushrooms and medicinal herbs from residence villages, there were other overriding reasons for these products. About 83% of the households, which did not extract mushrooms from residence villages, indicated that mushrooms were not their relish of choice compared to other alternatives. About 95% of the households that did not use medicinal herbs from their residence villages indicated that they did not prefer herbal remedies or that they could not use them on religious grounds.

A comparison across villages shows that the majority of the households in each of the villages extracted woodland products from their own villages, with variable proportions of the villages also extracting different products from other villages (Figure 5). Markedly more households in Samanyika and Mawadza villages (Figures 5a and b) extracted a wider variety of woodland products from outside their villages compared to the other villages (Figures 5c, d, and e). Samanyika and Mawadza villages occupy extensively cultivated lowlands of predominantly granite-derived sandy soils in the southern parts of the study area (Mandondo, 2001). Except for Pwanya hill, a conical shaped granitic feature lying close to the boundary between the two villages, much of the area in these two villages has a relatively poor woodland resource base. None to very few of the households in Mukurakudya, Sanyatwe, and Shamwarira villages, which occupy the relatively more well-wooded uplands in the northern parts of the study area, extracted heavier products like fuelwood, wall and roofing poles, kraal and fence poles, and brushwood from outside their villages. Lighter products like mushrooms, wild fruits, medicinal herbs, and tree-bark ropes appeared to be the ones which were extracted



**Figure 5.** Differences among villages in the acquisition of woodland products from own villages and from other villages ( $n = 40$  in each village). (*Note:* percentages add up to more than 100 because some households acquire resources from both their villages and from surrounding villages.)



**Figure 6.** Differences in the use of resources extracted from residence villages by: (a) gender of household head; (b) age of household head; (c) clan membership; (d) length of residence; and (continued on next page) (e) religious affiliation; (f) educational levels; (g) oxen ownership; (h) ox-cart ownership; and , (i) main house type.

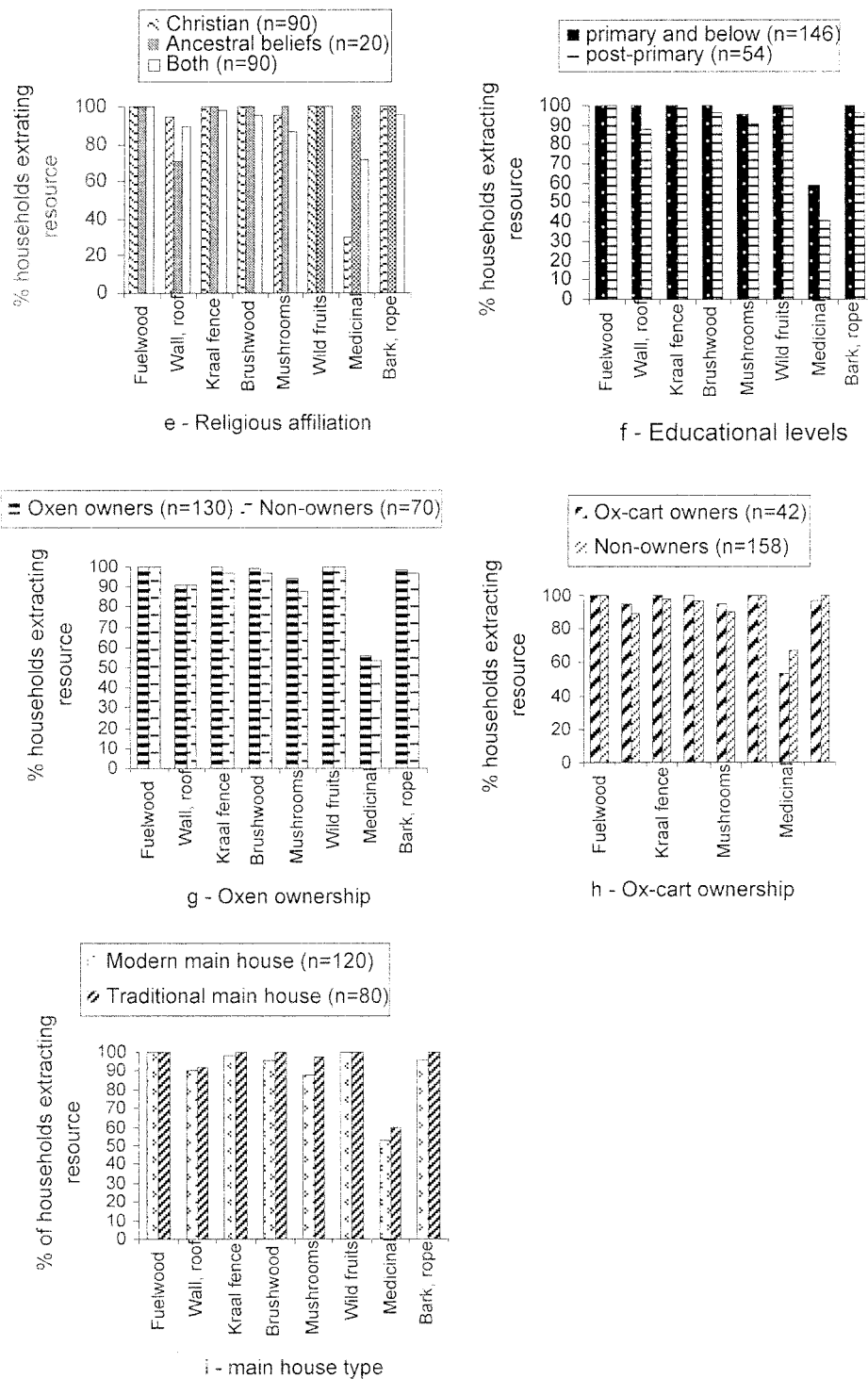


Figure 6. Continued.

from outside villages by considerable proportions of the households in these relatively more well-wooded villages (Figures 5c, d, and e). In general, wild fruit was the product that most of the households in each of the villages extracted from outside their villages, while fuelwood and wall and roofing poles were the products extracted from outside villages by the least number of households in each village (Figure 5).

*Aspects of differentiation in use of resources from within residence villages*

Questionnaire data showed no significant differentiation in the acquisition of wood products from residence villages (Figure 6). There were, nevertheless, trends towards more female-headed households extracting mushrooms and medicinal herbs from residence villages compared to male-headed households (Figure 6a). Markedly more households with elderly household heads extracted mushrooms and medicinal herbs from residence villages compared to households with young and mid-aged heads (Figure 6b). Extraction of woodland products was not markedly patterned by membership to ruling clan (Figure 6c) but more immigrant households showed trends towards acquiring resources, especially medicinal herbs, from residence villages compared to households of longer residence in the area (Figure 6d). Use of most products from residence villages was not markedly patterned by the religious affiliation of the informants, except for medicinal herbs, which tended to be acquired by more households believing in ancestral spirits compared to Christian households or those households believing in both systems (Figure 6e). There were also slight trends towards more households with heads who received little or no formal learning to acquire woodland products from residence villages compared to those who attained post-primary levels of education (Figure 6f). The acquisition of most products from residence villages bore little or relation to oxen or oxcart ownership (Figures 6g and h). There were also very small trends towards more households with traditional types of main houses to acquire a variety of products from residence villages compared to households with modern main house types (Figure 6i).

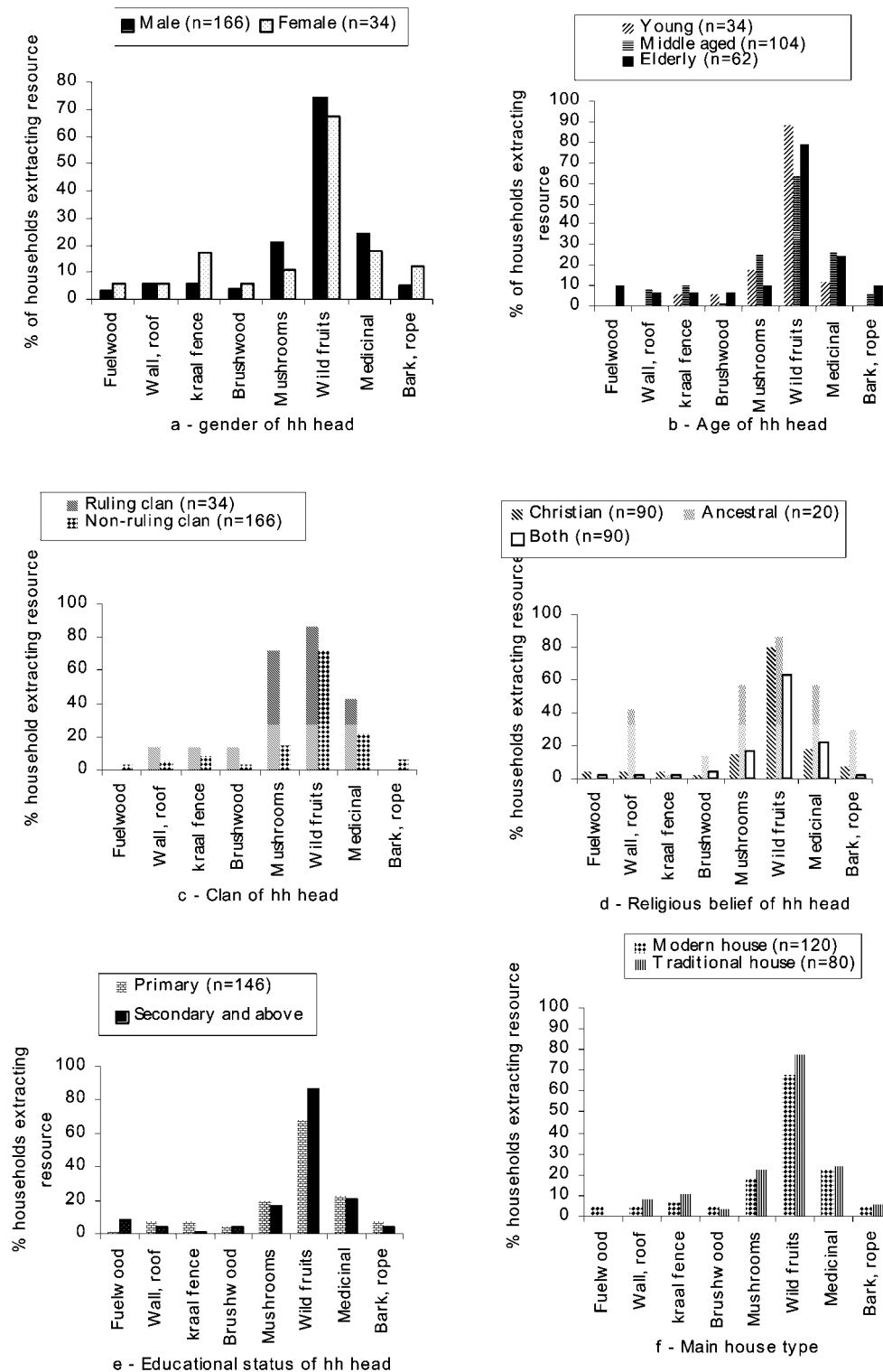
*Aspects of differentiation in use of resources across villages*

The proportions of households acquiring woodland products from outside their villages was not significantly associated with the following variables: gender of household head (Figure 7a); age of household head (Figure 7b); educational level of household head (Figure 7c); and main house type (Figure 7f). Extraction of mushrooms from outside residence villages was

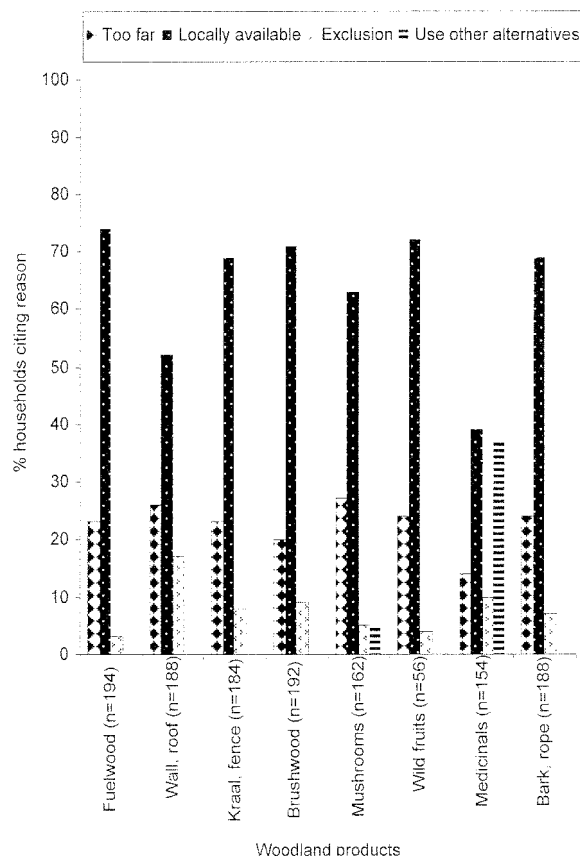
significantly associated with clan membership ( $\chi^2$  test;  $\chi^2 = 10.71$ ; d.f. = 2;  $P < 0.01$ ). A greater percentage (72%) of households belonging to the ruling clan extracted mushrooms from other villages compared to households of the non-ruling clan (15%) (Figure 7c). Significantly more households that exclusively believe in ancestral spirits (57%) extracted mushrooms from other villages than those holding Christian beliefs (15%), or believing in both (17%) ( $\chi^2$  test;  $\chi^2 = 4.6$ ; d.f. = 2;  $P < 0.05$ ). Religious belief of household head was also significantly associated with extraction of medicinal herbs ( $\chi^2$  test;  $\chi^2 = 5.7$ ; d.f. = 2;  $P < 0.05$ ), and tree-bark ropes ( $\chi^2$  test;  $\chi^2 = 6.4$ ; d.f. = 2;  $P < 0.05$ ) from other villages. Significantly (57%) more households exclusively believing in ancestral spirits extracted medicinal herbs from other villages than Christian households (18%) or households believing in both Christianity and ancestral spirits (22%) (Figure 7d). The same applied for tree bark ropes for which significantly more households (29%) believing in ancestral spirits acquired the resource from other villages compared to Christian households (7%) or those believing in both (2%) (Figure 7d).

*Reasons for not acquiring woodland products from other villages*

Reasons why some households do not extract woodland products from other villages fell into four post-coded classes: availability of the product in residence village; long travel distances to access resources outside residence villages; exclusion from accessing resources in other villages by residents of those villages; and, availability of alternatives for wood products. The major reason why most people did not extract woodland products from other villages was because the products were available in their villages of residence (Figure 8). Long travel distances to access resources in other villages was the second most important consideration underlying non-use of the woodland products from other villages. Exclusion from accessing resources by members of other villages also applied for all products but it appeared to be a less important consideration for most of the villages – with less than 15% of the concerned households considering it for any given resource. Mushrooms and medicinal herbs were the only products that were not extracted from other villages by some households because the households preferred other substitutes and alternatives to these products. Examples of substitutes and alternatives available to these households were similar to those listed earlier (Table 1).



**Figure 7.** Differences in the use of resources extracted from other villages by: (a) gender of household head; (b) age of household head; (c) clan membership; (d) religious belief of household head; (e) educational level of household head; and (f) main house type.



**Figure 8.** Reasons why some households do not extract resources from outlying villages.

## Discussion

### *Resource use within and across villages*

From a spatial resource use perspective, villages in Nyamaropa are bounded by soft boundaries, as resources can be acquired within and across villages (Figure 4). Similar findings were reported in studies conducted elsewhere in Zimbabwe. For instance, Lynam et al. (1996) found that resource use boundaries do not match those of WADCOs or traditional villages in the Zambezi Valley. Similar resource use scenarios, within and across VIDCOs in the Mzola area of Matabeleland North Province, were reported by the Gwaai Working Group (1997).

The following factors or combinations of them variously influenced use of resources within and across villages: the nature of the resource; spatial patterns of availability of resources; spatial distribution of resources in relation to considerations of household labor; availability of substitutes or alternatives in relation to user preferences; and, to a lesser extent, the profile (social, economic, religious, etc.) of the user and exclusion by members of other villages. The first three factors, especially in relation to their implica-

tions on household labor, appeared to be the most important in determining patterns of use of resources within and across villages. From the perspective of the nature of the woodland product, more households acquired lighter products like wild fruits, mushrooms, and medicinal herbs from other villages compared to bulkier products like fuelwood, kraal and fence posts, wall and roof poles, and brushwood (Figure 4). Except for medicinal herbs, most households used woodland products acquired from their villages of residence. The few households that did not extract the products from their own villages were largely constrained by unavailability of the products and long travel distances to the locations in which the products occurred in their own villages. This suggests that because of variations in the location of homesteads within the landscape, some households, especially those lying adjacent to other villages, may find it easier to acquire resources from adjoining villages. Nonetheless, except for wild fruits, the majority of the households extracted products from their residence villages than from other villages mainly due to the availability of the products within their own villages and long travel distances to locations in which the products occurred in other villages (Figure 8).

The generally low incidence of extraction of woodland products from other villages suggests that woodland resources are still relatively more abundant in Nyamaropa, compared to other areas. For instance, the study by Lynam et al. (1996) recorded more intensive use of resources across villages and wards, with more than 80% of the households acquiring resources from outside their residence units in the Zambezi Valley. Village-level comparisons, nevertheless, showed inter-village differences in the use of woodland products acquired from outside residence villages. None to very few households in the relatively more well-wooded Shamwarira and Sanyatwe villages acquired heavier products like fuelwood, wall and roof poles, kraal and fence posts, and brushwood from outside their villages. The reverse held true for the less well-wooded Samanyika and Mawadza villages in which there were trends towards households extracting a broader range of resources from outside (Figure 5). A considerable proportion of households in Mukurakudya village, nevertheless, extracted a variety of woodland products from other villages, in spite of the location of the village within a well-wooded area. This may be underlain by other factors, e.g., more intimate interaction of people living in the area with the resource base arising from a longer period of residence in the area, as outlined in the study area section of this paper.

The proportions of households that did not extract woodland products from other villages because of considerations of exclusion by members of other villages was invariably low (mostly less than 10%) for

most of the products (Figure 8). This strengthens the finding, from key informant interviews, that people in most villages largely do not deny woodland users from other villages access to resources in their villages. People purported not to deny such access as long as they were familiar with the users or if the users did not extract resources from areas under ritual designations or for commercialization. In fact, conflicts over use of resources across villages appear to be centered around parts of the local environment that are under ritual designations. Conflicts were also noted to have occurred when some villages sold fuelwood to a nearby irrigation scheme, where the wood is needed for tobacco curing.

*Patterns of use of resources in relation to linking costs to benefits of resource use*

The costs of extraction of resources (presumably in terms of depletion in source areas and localized environmental impacts) are likely to depend on the nature of the resource in question. Lighter woodland products like wild fruits, mushrooms, and medicinal herbs (depending on part extracted and method of extraction) are likely to have relatively less impacts on the woodland compared to extraction of products like fuelwood and poles. Different resource use set-ups within and across villages have different implications on the scope for apportioning cost and benefits of resource use – assuming the traditional village as the lowest unit of ownership and management of resources.

Most households used products extracted from their residence villages and there was no differentiation in the use of woodland products extracted from residence villages (Figure 6). Such a resource use setting implies that the costs and benefits of resource use accrue directly to members of the villages, who as per LTC recommendations could be designated as the “owners.” Nevertheless acquisition of all products, particularly the lighter ones like mushrooms, wild fruits, and medicinal herbs, extended beyond village boundaries – which implies that the benefits associated with extra-village resource extraction accrue to users in other villages while source villages bear the costs. From a user perspective, significantly more households of the chiefly clan than those of non-chiefly clan acquired mushrooms from other villages, presumably because of their longer history of interaction with the environment. Also significantly more households holding ancestral beliefs than Christian households or those holding both beliefs, extracted mushrooms and medicinal herbs from other villages. The benefits of extracting resources from other villages, therefore, do not accrue to all households but only to those who extract the resources from other villages. From

a spatial perspective, villages in areas with relatively poorer woodland resource bases had more households extracting resources from other villages – which means that there are disparities in appropriation of costs and benefits of resource use across villages. A policy formulation compatible with soft boundaries across which there are differential patterns of use of resources could, therefore, be one that ensures that differential costs are equivalent to differential benefits. The practical aspects of putting in place such a system, nevertheless, appear daunting as it should entail high organizational costs within systems in which people have other overriding priorities for their time and effort (Scoones et al., 1996).

To be effective, efforts to rationalize the disparities between cost and benefits of resource use (e.g., by combining cost, ownership, benefit, use, and management in discrete units), will need to consider operational context – in particular – resource use relations among units. Study results suggest that extraction of resources from other villages largely does not evoke outrage among people in source villages as long as the people are familiar with the users, if users do not extract for commercialization or from areas under ritual designations. The generally amicable inter-village resource use relations could be underlain by several reasons. First, adjoining villages may be relatively homogenous, with relatively less pronounced differences in values and interests – as is evidenced by the generally low levels of differentiation in patterns of use of woodland resources. Second, users of resources from other villages may be extracting the resources within accepted norms of civility, such that it does not induce moral outrage and economic anger in source villages. Lastly, perceived scarcity of woodland resources may still be relatively low to justify the organizational costs of intensively managing the resources. Understanding the reasons underlying a particular resource use outcome is, however, not of much use on its own since social characteristics, patterns of resource use, incentives for use and the resource base itself are ever-changing (Berry, 1993). This means that there are no “rules of thumb” to addressing most problems associated with natural resource use at the local level (e.g., question of apportioning costs and benefits of use), as they are more effectively addressed in dynamic (adaptive) perspective.

*Implications for policy*

Considered simply, accountability in natural resource use is enhanced through arrangements that define users of the resources as the “owners” and managers of the resources – so that the costs and benefits of

resource use accrue directly to them (Ostrom, 1990; Murphree, 1991). Criteria for defining the boundaries of units in which the various components can be effectively combined have, nevertheless presented problems. Policy planners for decentralized natural resource management initiatives (e.g., CAMPFIRE and the Land Tenure Commission) have invariably defined the units on the basis of geographic, demographic, or administrative boundaries. Study findings suggest mismatches between villages as geographically defined units and local "social boundaries"<sup>5</sup> of use, ownership, and management of resources. For instance, from the perspective of use, people were found to acquire resources within and across villages (Figure 4). In general, people extracted resources from places that were near or where resources were available and easier to access, and quite often these places were in other villages. Inter-village resource use relations did not invariably appear to be antagonistic, with most people recognizing the rights of users from outside villages to acquire resources from their villages, except for sacred areas or for commercialization.

The recommendation of the Land Tenure Commission, for the need to – "adjudicate and map traditional villages" in order to "grant village registration titles" so as to "formalize boundaries and minimize boundary disputes" (Government of Zimbabwe, 1994) – appear somewhat simplistic. There appears to be an apparent lack of "discreteness" to village boundaries from a resource use perspective. General incongruities between administrative units and resource use units at various scales also appears to defy the logic of aspiring for "distinct" units of resource use and management, or trying to "engineer" their establishment – as is implicit in the term "design principle" (Ostrom, 1990). Evidence of generally amicable resource use relations among villages contradicts the logic of having villages exercise exclusive legal control over resources in their villages (e.g., as per Land Tenure Commission recommendations). Findings from this study and those reported above suggest that instead of searching for "distinct" boundaries, it may be more useful to accept "diffuse and soft" boundaries as a given, and then set out from there. For instance, it may make better sense to answer the question of how resource management can be made appropriate, and compatible with existing set-ups.

The recommendation of the Land Tenure Commission suggests an implied intention to formalize a system in which villagers exercise exclusive control over resources in their villages. Such a system stands to distort existing patterns (including mutual ones) of access to resources. Study findings suggest that although the idea of clear village boundaries is a good

one (from perspective of linking costs to benefits), it can best function in a context of the following resource management formulations that appear to accord better with the context of soft boundaries: the existing informal "give and take"; resource sharing; and, conflict resolution.

There appears to be no justification for doing away with the current informal "give and take" patterns of access to resources as long as they are consensual or do not compromise improved natural resource management. Formal resource sharing arrangements also appear more appropriate for villages with wide disparities in resource endowments and in contexts where inter-village resource use may be consensual but unsustainable. Resource sharing in the former context would guarantee people living in villages with woodland deficits access to important resources, which may be available in adjacent villages. In which case, assessment of village resource states will need to become part of mapping activities, which as the Land Tenure Commission recommends, should precede village registration. The resource sharing referred to here can best be considered as part of a broader and dynamic community environmental dialogue in which intra-village charters of access to resources are changed in accordance with sustainability, equity, and other community considerations and priorities. This appears to accord better with a scenario in which use of resources across villages largely appears to be on amicable terms. Conflict resolution will have to complement resource sharing arrangements in contexts where antagonistic resource use relations result in conflict. Management on the basis of rights of exclusion appears most ideal for curtailing extraction of resources for commercialization and extraction of resources from areas under ritual designations.

## Notes

1. CAMPFIRE is an acronym for Communal Areas Management Programme for Indigenous Resources. It is a program that aspires to empower communal people to manage local wildlife resources and benefit from their utilization (Peterson, 1991). The program indirectly extends custodianship of wildlife resources to local communities (the producer communities), through local authorities (Rural District Councils) that are legally-designated as the "appropriate authorities" (Child, 1993).
2. VIDCOs and WADCOs are structures that were created under the prime minister's directive of 1984, purportedly to give a democratic orientation to the process of local governance (they are based on a system of popular representation). VIDCO is an acronym for village development committee. It is the lowest administrative unit and its function is to identify and articulate the needs of the village.

The VIDCO normally consists of 100 households (with slight variations from area to area), presided over by an elected chairperson. WADCO stands for ward development committee, a body over-arching several VIDCOs (usually six per ward). The ward draws its membership from leaders of its constituent VIDCOs and is presided over by an elected councillor who represents the ward at the district level. These structures exist side by side with traditional administrative structures (presided over by chiefs and headmen) with which they are often in conflict. VIDCOs and WADCOs have been widely discredited (have socialist leanings) and currently there are official moves to now do away with them. VIDCOs have largely waned in Nyamaropa.

3. The rope used for tying poles together when constructing wooden structures like huts is derived from the bark of some trees, e.g., *Brachystegia spiciformis*.
4. These factors were, in fact, part of an agricultural extension worker's views on why use of resources across villages largely did not appear to result in conflicts. The extension worker resides in Samanyika village.
5. Social boundaries denotes the operational context – i.e., ownership, management, and use boundaries as understood by the local communities themselves. Addressing the issue of system boundaries Hyden (1996: 66) also argues that there is no "system" in African society, ... "only a social logic that guides human interaction at a personal level."

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