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## Migration and ethnicity as cultural impact factors on land use change in the rainforest margins of Central Sulawesi, Indonesia

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### Summary

Human activity endangers tropical forests in different parts of the world. The conflicting interests of nature conservation on the one hand, and the livelihood of farmers living at the forest margins, on the other, clash noticeably in so-called hotspots of biodiversity, such as the Lore Lindu region of Central Sulawesi, Indonesia. Biodiversity generally decreases along a land use gradient from natural forest to agroforestry and annual crop systems. Thus, before solutions for a sustainable balance between conservation and the needs of people living at the forest margins can be sought, changing land use strategies and the factors that influence them must be analyzed. While similar studies often concentrate on economic indicators of land use change only, this chapter highlights the importance of two cultural realities, namely migration and ethnicity. We will demonstrate the great influence of these two factors on land use decisions and on the accessibility of land in the Lore Lindu region.

Based on results from previous qualitative studies, we selected three upland villages, which represent a continuum that leads, in terms of migration history, from a pre-transition village, to a transitional village, to a post-transition village. We used quantitative and qualitative methods for our analysis.

The results show a general land use change in the region, ranging from a strategy that places food first (e.g., rice) to one that places cash first, especially by the cultivation of cacao. This change cannot be observed to the same

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extent in the study region as a whole. It varies from village to village, depending on the share of households belonging to the Bugis migrants. Bugis as an ethnic group and as migrants have an enormous effect on the land use decisions of local ethnic groups in their respective villages. Strong ethnic networks among Bugis migrants play an important role not only with respect to their village preferences, but also with respect to the transfer of knowledge regarding agricultural management. A lack of interaction between local and migrant ethnic groups results in differences in the efficiency of cacao cultivation. While the Bugis migrants mainly buy their agricultural land from local farmers or, depending on the village's migration history, from other Bugis households, members of the autochthonous ethnic group usually clear the primary forest. The findings of the present study reveal that an analysis of migration and ethnicity is a crucial precondition to finding sustainable solutions for ensuring that the margins of the rainforest in the Lore Lindu region remain stable. This chapter will emphasize that, in addition to economic considerations, an analysis of the cultural forces that influence land use changes cannot be neglected.

*Keywords:* migration, ethnicity, cultural orientation system, land use change, access to land, Central Sulawesi, Indonesia

## 1 Introduction

Located within the bio-geographic region of Wallacea, the island of Sulawesi, Indonesia, represents one of the world's most important hotspots of biodiversity. Within this region, the Lore Lindu National Park of Central Sulawesi plays an essential role in the conservation of endemic fauna and flora (Waltert et al. 2004, Schulze et al. 2004a). As elsewhere in the tropics, however, this forest reserve is endangered by human activities (for a general overview of deforestation in the tropics, see Achard et al. 2002, DeFries et al. 2000, Turner et al. 1990, Watson et al. 2001). Between 1971 and 2002, the area of primary forest in the Lore Lindu region decreased by 18 percent, resulting in an annual rate of deforestation of 0.6 percent (Erasmí et al. 2004). Forest encroachments along with agricultural land conversion contribute greatly to causing severe disturbances of the region's ecosystems. As demonstrated by Schulze et al. (2004b) for the region covered in this chapter, in most cases diversity of bird, plant, and insect species decreases along a land use gradient from natural forest to agroforestry and annual cropping systems (for the diversity of beetles, see Bos et al. in this volume). Moreover, the risk of soil erosion on mountain slopes increases from natural forest to fallow land, to perennial crop systems (e.g., cacao, *Theobroma cacao*), and annual crops systems (e.g., maize; Kleinhans and Gerold 2004). Population growth and increasing commercialization, along with a growing need for further agricultural land, especially for cash crop and agroforestry use, aggravate this situation.

Faced with this problem of conflicting demands for land use, one is confronted with the following question: How is stability along the rainforest margins possible? Stability in this connection signifies striking a sustainable balance between forest conservation on the one hand and the livelihood of the people living in the forest's vicinity on the other hand. Without taking into account the socio-cultural and economic needs of these people, sustainable stability at rainforest margins cannot be achieved. As the vast majority of people living in areas such as the Lore Lindu region are farmers, an understanding of their decisions with regard to natural resource management is crucial. Therefore, before finding solutions to this question, an investigation of the factors that influence farmers' decision-making on land use is necessary, a point that is underlined as well by Perz et al. (2005), Turner et al. (1995), and Wood (1992). While other studies often regard this topic from an economic point of view (see e.g. Bann 2000, Maertens 2003, Schwarze 2004, Yaron 2001), this paper focuses on the cultural forces that influence land use decisions. We will concentrate on migration patterns and ethnicity, two cultural factors that we regard as crucial for determining land use changes in the Lore Lindu region, as well as in other tropical frontier zones.

## 2 Conceptual framework

Studies by Gumbo et al. (2000) and Duram et al. (2004) state that to understand global environmental change one must focus on a local area to provide an in-depth view of the components of land use change. Therefore, an analysis of local variations of land use decisions is important as a base for more general conclusions concerning the factors that cause changes in natural resource use and management.

For this study, which focuses on migration and ethnicity, we partly adopt the concept of culture as an orientation system (Thomas 1993, 1999). Central attributes of this orientation system can be defined as culture standards, i.e., the many varieties of perceiving, thinking, judging, and acting that the members of a group take for typical, self-evident, and mandatory. While Thomas's concept supports the view of culture as homogeneous for a certain group of individuals, Hofstede (1994) suggests that culture defined as an orientation system is not necessarily shared by all individuals who live or have lived within the same social environment. Nevertheless, both approaches draw a too static portrait of culture and neglect the underlying dynamism. Allolio-Näcke et al. (2002) complain that Thomas's and Hofstede's concepts lack the necessary awareness of the reciprocal influences that cultures have on one another. With regard to this, they refer to recent theories that emphasize the hybrid nature of cultural orientation systems (Bhabba 1994, Hannerz 1987, Pieterse 1994, Welsh 1999).

Such reinterpretations of culture are important and essential, but they are also liable to tend to an 'anything goes' discourse. As culture should be

regarded as a multi-dimensional system, one may conclude that culture is scientifically unmanageable because everything is culture (see Mitchell 2003, Smith 2000) and respective cultures are too different from each other. Although we agree that this critique of Thomas's concept is justified and that culture is a "complex whole" (Tylor 1871), we nevertheless need to find a conceptual solution for the scientific treatment of aspects of a given culture.

For this study, we choose migration and ethnicity as the two main components that shape the cultural orientation system, which in turn influences decision-making concerning land use (see Figure 1). Recent studies in other world regions affirm the importance of migration and ethnicity (see e.g. Breusers 2001, Joseph 2002). Prior qualitative investigations in the Lore Lindu region refer to the great impact of migration and ethnicity on land use change. So far, however, a quantitative demonstration is largely missing. While migration, in general, is influenced by one or more different factors, such as economic, political, or social ones, it has strong implications for the orientation systems of both the migrant and the people in the target region. Thus, in this context we regard migration as a cultural factor that shapes the orientation system(s). In this chapter, we focus mainly on spontaneous rural migration from areas within and outside of the study region to a given village. The terminus ethnicity, in our study, does not only include the peoples' perception of belonging to a certain ethnic group, but also the knowledge and skills that characterize the majority of an ethnic group. Such special characteristics probably influence farmers' land use decisions.

With regard to land use decisions, access regulations to land play a predominant role. They determine the possible land use options on a particular piece of land and are strongly linked to migration and ethnicity (see Figure 1). Citing Gramsci (1971) and Foucault (1984), Peluso (2005) points out that power relations in local territorial resource management may involve the exercise of discipline through coercion and consent, but that they do not necessarily involve the authority of national governments. The examples of local changes in land allocation since the decline of the authoritarian Suharto regime in 1998 and the consequent power decentralization in Indonesia (see Abdulkadir-Sunito and Sitorus, in this volume) demonstrate how local policies (i.e., at the village level) influence access to land. In addition to their causal links to political changes on the national level, however, cases of different local land allocation policies, which are not directly linked to national developments, also exist (Weber 2006). Migration has an impact on access to land, depending on who is migrating and when migration occurs (see e.g. Doevenspeck 2004, Rodgers 1991). Ethnic affiliations play an important role in such regions as our study area and influence the access to land (see e.g. Bonte 1999, Sitorus 2002, Venema and Mguild 2003). Especially if land allocation is managed by local authorities exercising customary law rather than by national authorities, belonging or not belonging to the ethnic group of local rulers can influence one's access to land.

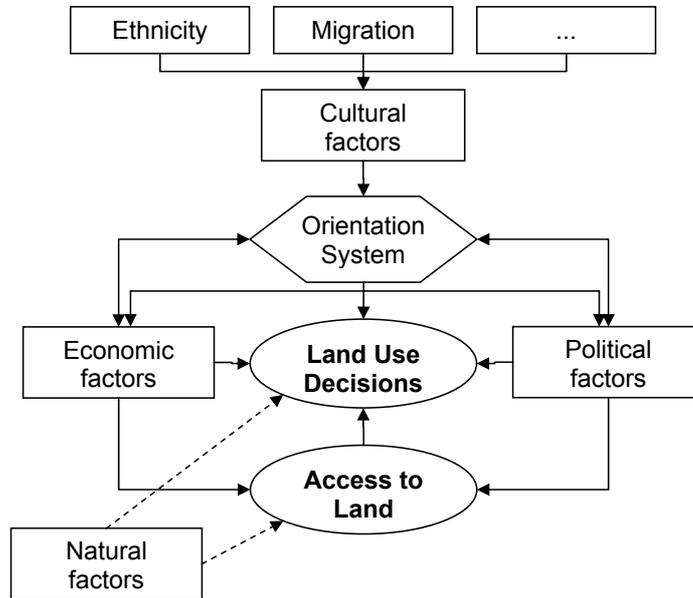


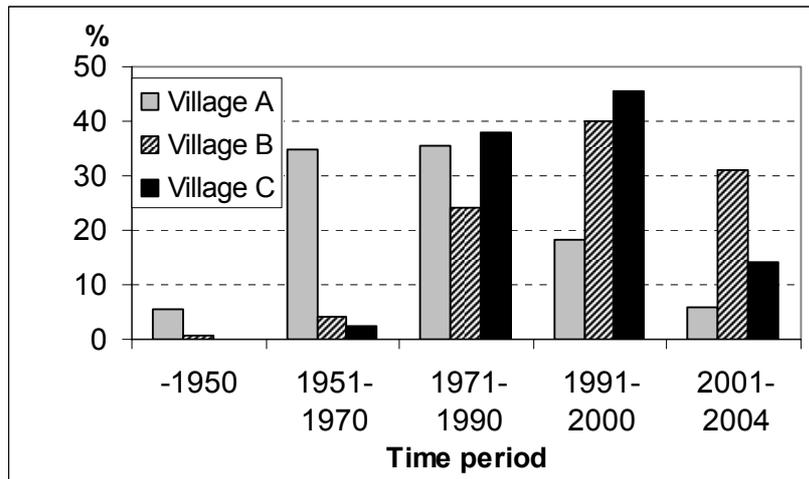
Fig. 1. Conceptual framework

### 3 Methods

The study in this paper uses a multi-method approach, combining quantitative and qualitative research tools. The quantitative part is covered by a census that was conducted in three villages within the study region in 2004. We selected the villages based on our previous qualitative studies regarding cultural change in the Lore Lindu region during the 20<sup>th</sup> century (see Weber et al. 2003, Faust et al. 2003, Hoppe and Faust 2004, Kreisel et al. 2004, Weber 2006). The three villages, named A, B, and C, were assumed to represent different stages on a transition continuum, a transition which is for the most part initiated by the villagers' migration patterns. This continuum encompasses a relatively static type of village (A), where the number of new migrants decreased steadily during the last 15 years, to a quite dynamic or post-transitional village (C). The latter is characterized by a high share of local migrants who were among the first settlers in the 1970s, and a high share of regional migrants from South Sulawesi who settled down during a relatively short period (1980-2000). Village B is situated between the two extremes and represents a village in transition, as 30 percent of all migrants arrived during

just the past four years (see Figure 2). All three villages are located in the uplands of the Lore Lindu region and have similar access to roadways.

For the village census we interviewed all those household heads who responded using standardized questionnaires. For different reasons, only very few household heads could not be interviewed. In total, 898 households (hh) were interviewed (521 hh in village A, 148 in village B, and 229 in village C). The whole data set provides land use information for 1,803 agricultural plots (1,198 plots in village A, 298 plots in village B, and 308 plots in village C). The census data cover the following topics: demography of household members, migration, land access, land use, input/output per plot, use of forest products, labor division, knowledge/information transfer, labor, market access, livestock, income, socio-cultural interrelations, change of perceptions, consumption, dwelling conditions, assets, and environmental perception. Conducting a census is advantageous in that a very realistic picture of the village can be painted, for not only a *sample* of village households, but *every* village household is interviewed.



**Fig. 2.** Temporal distribution of the arrival of migrants in the three study villages (Source: STORMA project A1 village census 2004; number of observations = 557)

In addition to the quantitative census data set, qualitative data are indispensable for interpreting quantitative results, for verifying causal relations, and for revealing why people make the decisions they do. Our qualitative methods included formal, semi-structured in-depth interviews with the heads of selected migrant and non-migrant households belonging to different ethnic groups, and with village representatives. We also conducted informal talks,

discussions, and participant observations. Besides the studies in the three census villages, we benefited from our previous qualitative investigations, as noted earlier in this paper. The integration of our research within the interdisciplinary STORMA project also enables us to benefit from the results of other social and natural science research within the study region.

#### 4 Land use changes in the Lore Lindu region

For the past 100 years, the Lore Lindu region has experienced a variety of land use changes, most of which were brought about by the respective political rulers of the central or regional governments. First modifications to land use, beginning in the period from 1904 to 1908, were enforced by the Dutch colonial leaders (Weber et al. 2003). At that time, the then widespread practice of slash-and-burn cultivation was curbed by the expansion of wet rice fields in the plains of the lowlands and the uplands – an expansion that was accompanied by forced local resettlements from the mountain areas to the valleys. Also, indigenous noble families learned about the coffee plant, and coconut trees, an important cash crop, were planted. During their three years of occupation (1942-1945), the Japanese colonial rulers forced the people to plant cotton, a practice that put subsistence cultivation at risk of being neglected. One result was that numerous bouts of famine occurred in the region.

**Table 1.** Crop preferences in the three study villages

	Main crops cultivated (in %)					Total
	Cacao	Coffee	Wet rice	Maize	Others	
Village A	55.6	3.1	36.6	1.4	3.3	100.0
Village B	87.6	0.7	0.0	8.1	3.7	100.1*
Village C	96.1	0.0	0.3	2.3	1.3	100.0

Source: STORMA project A1 village census 2004

Number of observations = 1804

\*Deviation from 100.0% due to rounding

Major land use changes followed the colonial period (Weber 2006). Cotton cultivation was abandoned and the former land use mix of wet rice cultivation, dry land rice, and mixed vegetable crop cultivation (*palawija*), along with coffee and coconut tree cultivation was re-established. By the late 1970s, the Indonesian government officially prohibited shifting cultivation and supported an increase of wet rice production by the continuation of local resettlements from the hills to the plains, as the Dutch had done during their rule. At the same time, world market prices increasingly influenced local farmers' decisions

to augment their cash crop production. Besides coffee, clove became an important cash crop. While wet rice was planted in the plains, the former shifting cultivation fields were permanently replaced with cash crops and mixed food crops. The cultivation of the latter, however, remained the first choice for the vast majority of farmers, as they recognized the importance of an independent supply of subsistence crops.

The introduction and spread of the cacao plant in the early 1980s marks the largest and most far-reaching land use transformation in the Lore Lindu region of recent times. Today, many fields formerly planted with annual crops, such as rice, maize, vegetables, and fruits, or with perennial crops, such as coffee and clove, are being converted into cacao fields. Furthermore, recently cleared forest plots are planted with cacao. Cacao is usually grown as a monoculture or cultivated with coffee. For the STORMA project's research, three shading types were identified: (1) cacao planted under natural forest cover; (2) under highly diversified planted shade trees; and (3), under planted shade trees, the majority of which belong to one species.

## 5 The impact of migration and ethnicity on land use decisions in the Lore Lindu region

Since the mid-1990s (at the latest), cacao has become economically the most important crop in the study region and, thus, one might assume that the vast majority of farmers have changed their land use decisions in favor of this profitable plant. As Table 1 shows, however, this agricultural change did not occur to the same extent in all villages. While the share of cacao fields does not exceed 56 percent in pre-transition village A, it increases to almost 87 percent in transitional village B, and it reaches more than 96 percent in post-transition village C. Correspondingly, the share of food crop fields (e.g. rice and maize) decreases from village A to village C.

**Table 2.** Share of local and migrant households

	Share of local and migrant households (in %)		
	Local	Migrant	Total
Village A	58.2	41.8	100.0
Village B	28.4	71.6	100.0
Village C	7.0	93.0	100.0

Source: STORMA project A1 village census 2004  
Number of observations = 1804

In comparing these results with the share of migrants living in the respective villages (see Table 2), which shows the smallest value in village A and the

highest one in village C, one could argue that a direct causal relation exists between the share of migrants and the share of cacao fields in a given village. The Pearson correlation between the share of cacao and the share of migrants in the three villages even shows a significant result ( $p < 0.1$ ,  $R^2 = 0.95$ ). Thus, this outcome would support the simple equation: more migrants = more cacao. A detailed look at the ethnic affiliation of the migrants, however, presents a more complicated picture of this relation. Regarding the ethnic composition of village communities (see Table 3), we observe that the share of cacao fields increases with the share of Bugis migrants living in a village.

**Table 3.** Distribution of the different ethnic groups in the three study villages

	Distribution of ethnic groups (in %)					Total
	Local groups	Regional groups	South Sulawesi groups	Bugis	Others	
Village A	59.8	13.6	21.5	0.6	4.6	100.1*
Village B	65.3	18.4	1.4	15.0	0.0	100.1*
Village C	53.3	0.9	1.3	43.7	0.9	100.1*

Source: STORMA project A1 village census 2004

Number of observations = 1804

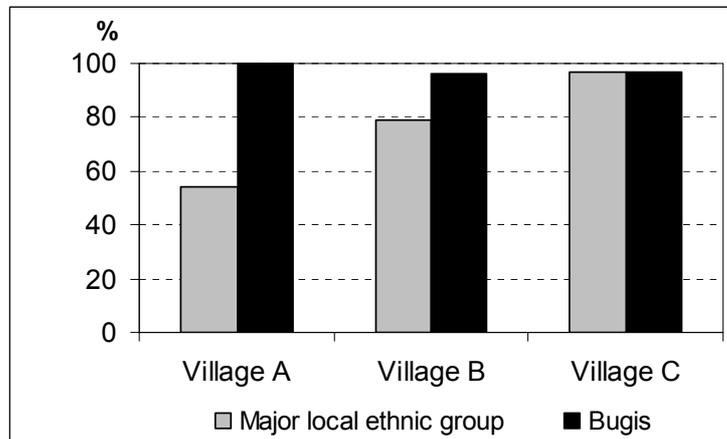
\* Deviation from 100.0 percent due to rounding

This result reinforces the findings of previous qualitative studies in this region (see Li 2002, Sitorus 2002, Weber 2006). Introduced by a Bugis trader around 1980, cacao cultivation started to spread in the Lore Lindu region. Bugis farmers from South Sulawesi, some of which gained the necessary knowledge about the cultivation of cacao during their stay as contract workers at cacao plantations in Malaysia during the late 1970s (Akiyama and Nishio 1996), moved to Central Sulawesi during the 1980s. As they faced increasing land scarcity, the Bugis migrants were attracted to the availability of suitable land for cacao cultivation at upland frontier zones such as those of Central Sulawesi. A boom in the Indonesian market price for cacao in the mid-1990s resulted in an enormous population increase of immigrants from South Sulawesi. A historical comparison of cacao production in other regions of the world (Hill 1953, 1963; Jamal and Pomp 1976; Ruf 1995; Ruf and Ehret 1993) shows that most cases of cacao boom are linked to major migration flows. But why is it that, in our case especially, it is the Bugis who play a predominant role in migration to the Lore Lindu region? Answers to this question are found in the history of this ethnic group. The Bugis, to whom Pelras (1998:27) assigns “a tradition specifically open to change” are known to be descendants of seafarers and traders who expanded their sphere of influence within Southeast Asia for centuries. They were interested in the establishment of strategic

alliances with newly opened territories, and they cemented these alliances through marriage and the foundation of new settlements (Pelras 1996). Although nowadays most Bugis are not concerned with seafaring anymore, the tradition of opening up new regions seems to have been preserved until today.

Although the Bugis migration led to an obvious land use change in many areas of the Lore Lindu region, not all villages were affected to the same extent. Besides limiting factors such as transportation infrastructure or climate conditions, social ethnic information networks and village policies represent two major determinants of the Bugis' migration decisions and patterns (Weber 2006).

As can be interpreted from Table 1 and 3 and as shown in Figure 3, cacao cultivation did not remain limited to Bugis farmers only. Nonetheless, the population of this migrant ethnic group in a village strongly affects the spread of cacao cultivation among the local ethnic groups.



**Fig. 3.** Share of cacao fields of the major local ethnic group and the Bugis group in the three study villages (in percent of the total number of fields cultivated by the respective group; Source: STORMA project A1 village census 2004; number of observations = 1268)

Figure 3 shows that the share of cacao among the main local ethnic groups' land use decisions is linked to the share of Bugis migrants living in the respective village. The proportion increases from 54 percent in pre-transition village A to 97 percent in post-transition village C.

Among all ethnic groups in the study region, ethnic networks do not only influence migration patterns, but also have an impact on spatial residential patterns and social and economic interactions within the villages. The net-

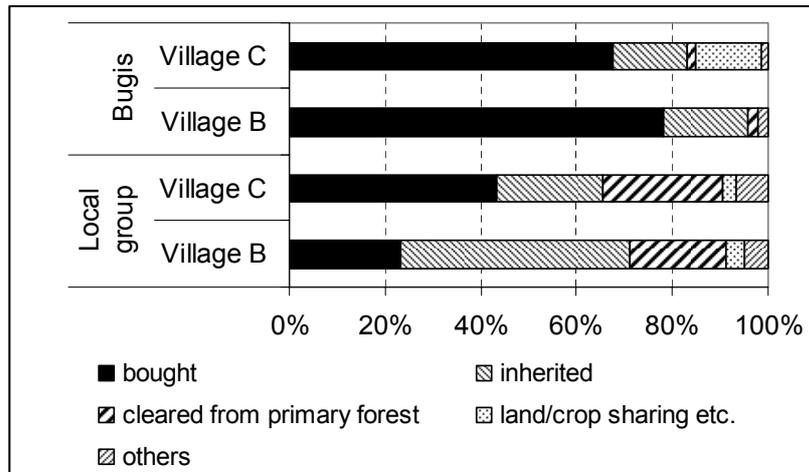
working within the largest autochthonous ethnic group of a village influences the village administration in its residential policies. Some villages in the research area practice spatial residential segregation based on such policies. More frequently, this segregation occurs as a result of ethnic networking within the migrant groups. Migrants often prefer living in neighborhoods composed of the same ethnic group. In most cases, family or friendship ties already exist before the arrival of a given migrant, and the information networking within these relationships often influences the decisions of migrants when they select the respective village as a migration target. Many respondents report that being close to people of the same ethnicity eases them into the new village. Given that religion plays an important role in the study region, different religious affiliations of the autochthonous and the migrant group, especially if it is Christian or Muslim, enforce residential segregation. In contrast, if locals and migrants have the same religion, then inter-ethnic marriages are more likely and thus reduce segregation.

Social interaction between local ethnic groups and Bugis is, apart from some exceptions, relatively low. Most local farmers gained their knowledge about cacao cultivation by observing the Bugis farmers, while only few of them directly asked the migrants from South Sulawesi about cultivation techniques. In accordance with the general statement of Laine (2004), which argues that land use decisions also depend on those of neighboring owners, it is understandable that the share of local farmers' investment in cacao cultivation increases in villages where more Bugis have settled. This does not, however, fully explain why the local farmers in village A plant more than 50 percent of their fields with cacao, although the share of Bugis migrants in this village is very low. The respondents report that their widespread family relations for each household are linked to a large network of villages within and outside the research area. These networks allow for information exchanges among members. When asked about what led to an increase in cacao cultivation, many respondents with local ethnic affiliation told that their relatives or friends, who live in other villages, which host a larger number of Bugis migrants, had reported the advantages of planting cacao. Thus, knowledge about cacao is transferred from villages with a higher Bugis population to villages with a lower one.

## **6 The impact of migration and ethnicity on access to land**

In addition to land use decisions, land access plays an important role in the communities that occupy the rainforest margins, especially when it comes to stability and destabilization of these margins. Cacao is mainly grown on the slopes within or close to the forest. In other words, this crop dominates the area along the sensitive forest borders. According to a survey, which included 301 households in the Lore Lindu region, the area of rain-fed farming acquired

by clearing away primary forest increased from less than 50 ha during the period extending from 1951 to 1990 to more than 60 ha during the comparably much shorter period of 1996 to 2001 (van Rheenen et al. 2004). This growth in forest conversion has to be seen within the context of the migrants-driven cacao boom in the study region. Although we do not agree with the general argument of Carr (2004:598), namely, that immigration is a “prerequisite to frontier forest conversion”, which he explains with examples derived from South America (Pichón and Bilsborrow 1999, Southgate et al. 1991, Wood and Perz 1996, Wood et al. 1996), immigration certainly can play a crucial role in forest conversion (see e.g. Faust et al. 2003). Our census data stand in contrast the general argument of Carr (2004) that immigration directly leads to forest clearing, which supports the assumption that it is predominantly the migrants who encroach into the forests. Figure 4 reveals that mainly ethnic groups, which call themselves the local group in the respective villages, clear the primary forest. Almost 20 percent of the plots owned by the main local ethnic group in village B were acquired in this way. In village C this type of land acquisition by the local group even reaches 25.0 percent. In both villages in contrast, Bugis migrants usually bought their land, while forest clearance makes up for less than one percent of all Bugis land acquisitions in each of the two villages.



**Fig. 4.** Land acquisition by the major local ethnic group and the Bugis in the villages B and C (Source: STORMA project A1 village census 2004; number of observations = 543)

When it comes to the Bugis migrants, it is, in contrast to the case study findings of Carr (2002) in Guatemala, not the exceptionally poor that are most likely to migrate to the forest frontiers. Our census data reveal that the majority of the Bugis farmers are found in the highest income groups. They have the financial means to purchase land. The local ethnic groups, which regard themselves as the owners of their village's territory, do not deem it necessary to buy land, but they do realize the opportunity of generating cash by selling parts of their land. The forest, which represents their customary land reserve, is cleared by the local groups to create a balance with the land sold outside the forest or to sell it in order to increase their cash income. This additional income is mainly used for buying status symbols (e.g., motorcycles, TV sets, furniture), purchases that are the results of the improved living standards displayed by the affluent Bugis migrants and the modern lifestyles portrayed on television programs. Additional income is also used for paying medical care and children's education. A quantitative comparison of the ethnic affiliations of buyers and sellers of land in transition village B and post-transition village C (see Table 4) demonstrates the aforementioned relation between local ethnic groups and Bugis. 55.6 percent of the land bought by Bugis in village B and the 38.9 percent bought in village C was sold by members of the main local ethnic group, whereas 41.6 percent in village B and 51.9 percent in village C were sold by other Bugis households.

The different proportion of land in the villages B and C that is sold within the Bugis group can be explained by the respective migration histories of the two villages. Many Bugis migrants in village C arrived earlier than those in village B, where we find a comparably high immigration rate during the past few years. This is one reason we made a distinction between the transitional and post-transitional village. Owing to the fact that more Bugis families have lived in village C for a longer time, more of them were able to increase their land holdings, portions of which they then were able to sell to Bugis migrants arriving later.

## 7 Conclusions

Our findings pertaining to aspects of the impact of migration and ethnicity on changes in land use contrast with the results of Casey and Caviglia (2000), who state that, in general, information is an important factor in decision-making in the tropical forest regions of Brazil and Mexico regardless of cultural and socio-economic variations. Our study's results reveal that migration patterns and ethnicity do play an important role in land use changes, especially if these changes are investigated at smaller scales (e.g., at the village level). Moreover, intra-ethnic information networks are, in this particular context, highly relevant. In the Lore Lindu region in general, one can observe a change from a 'food crops first' strategy to a 'cash crops first' strategy, dominated by the cultivation of cacao. This transitional change, however, does not occur to

**Table 4.** Land acquisition by the Bugis in the villages B and C

How acquired?	same ethnic group		other ethnic group (local)		other ethnic group (migrant)		village government etc. number	%
	number	%	number	%	number	%		
<b>Village B bought</b>								
inherited	7	41.7	1	20	55.6	1	2.8	0
cleared from primary forest land/crop sharing etc	0	87.5	0	1	12.5	0	0	0
other	0	0	0	0	0	0	0	100.0
<b>Village C bought</b>								
inherited	24	51.9	1	42	38.9	9	8.3	0.9
cleared from primary forest land/crop sharing etc.	0	96.0	0	1	4.0	0	0	0
others	18	81.8	4	18.2	0	0	0	100.0
others	1	50.0	0	0	0	0	1	0

Source: STORMA project A1 village census 2004  
 Number of observations = 205

the same extent within the whole study region, but rather depends largely on migration and ethnicity, as well as natural conditions that already exist in the immediate area. Our study villages represent three stages along a gradient, which includes the two above-mentioned land- use strategies.

The farmers' land use decision favoring the cash crop cacao is generally an economic one, but it is also related to cultural forces. As presented in our conceptual framework, the system that forms the basis for such a decision is influenced by a given individual's cultural background. The ethnic group's historical and cultural traditions, which are linked with territorial expansion, migration, and trade, shape the cultural orientation systems of many Bugis migrants. When they move to the study region, they are drawn to the prospect of economic success in the cultivation (and trade) of cacao. They are, like many entrepreneurs, well prepared for achieving their goals. On arrival at the new destination, they receive the necessary funds to allow them to purchase land, and they are already skilled in the cultivation of the crop. After the Bugis's arrival, the village's autochthonous groups adopt the cultivation of this new crop. The initial cause for this land use change is, once again, economic. Local ethnic farmers realize the financial advantages of engaging in the cultivation of cacao as they observe the rapid improvement of the Buginese cacao farmer's economic status. The majority of the autochthonous farmers, however, do not succeed in the same way as many Bugis because of their different cultural orientation systems. They conform to tradition, for example, by cultivating cacao on much smaller fields than the Buginese farmers. While most Bugis farmers in the study region concentrate their agricultural activities from the beginning on the cash crop cacao only, the cultivation of subsistence crops, especially rice, represents an important aspect of the autochthonous farmers' decision-making. Rice traditionally represents the basis of their livelihoods. Market-orientated crop production was traditionally valued as a way to generate additional income surplus, not as a total replacement of crop cultivation for food. The size of the Bugis community in a given village correlates to the speed of the autochthonous farmers' adoption of cacao cultivation. Here again, migration and ethnicity have an important influence on land use decisions. The Bugis migrants' selection of their target village, strongly depends on their intra-ethnic information networks. These allow for the exchange of information about the target village, including the availability of purchasable land, the suitability of the soil for farming, climate conditions for cacao cultivation, and the target village's immigration policy. In addition, the local ethnic groups' networks support the spread of cacao cultivation to villages where less Bugis migrants have settled. Based on our findings, we predict that if the economic conditions for cacao agroforestry do not deteriorate significantly, the change in land use strategy from food first to cash first will continue, even if one takes into account such factors as migration and ethnicity, both of which we discussed above.

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