
Chapter 5

The Impact of Migrating Mountain Farming Communities on Agrobiodiversity: A Case Study of the *Li* Minority Nationality in the Mountains of Hainan Island

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Introduction

This case study attempts to identify the impact of migration and immigration on the retention of agriculture and agrobiodiversity among the *Li* people. The paper describes how the agrobiodiversity managed traditionally by the *Li* community has changed under the influence of migration and immigration of members of the *Han* community. The impacts of continual migration and immigration on the environment and on agricultural biodiversity are studied to identify lessons to be learned.

Hainan province is an island located on the northern edge of the tropical zone and is one of the richest regions in terms of biodiversity in China. There are more than 4,200 vascular plant species and more than 410 animal species, suggesting good conditions for agrobiodiversity management. Hainan province is inhabited by about 6,557,482 people, including 1,115,096 members of 37 different minority ethnic groups. The *Li* people were the original inhabitants of the island. Until 1990, *Li* communities were spread throughout the province, but now they are more concentrated in the southwest of the province. This change has been caused by continual waves of immigration of the *Han* communities from the mainland. This migration was in fact started during the *Tang* dynasty (221 B.C. - 960 A.D.). Most *Han* settled in coastal and accessible areas with a potential for market opportunities. As a result of the social instability brought about by the feudal dynasties of the past, the *Li* community had to migrate to the thickly forested mountains. The *Han* and *Li* communities by their nature occupy different ecological niches in the same area; they have different cultures and means of transport and communication. Their management of crop biodiversity and farm economies also

varies considerably. The regions inhabited by the *Li* community have rich plant genetic resources but they are underused, the market is poorly developed, and farming is conventional. The *Li* community has not so far exploited the existing biodiversity for economic benefit. This experience suggests that a rich natural biodiversity/agrobiodiversity alone does not lead to the prosperity of a local community.

The Traditional Farming System of the *Li* Community

Before the *Tang* dynasty, agriculture in Hainan Island was basically primitive. 'Slash and burn' farming was the traditional practice of *Li* farmers, who called it 'shanlan'. Farmers used to collect seeds of wild upland rice from the mountains and sow them in their fields. Yields were very poor, ranging from 450 to 1,500 kg/ha. Although they cultivated upland rice, the *Li* community were not used to growing vegetables and fruits. Traditionally they depended on wild fruits and vegetables. Hunting, fishing, and gathering of wild fruits and local vegetables were an integral part of the food culture. The system was simple but backward from an economic point of view.

The royal court ruled the island from 221 B.C.- 960 A.D. during the *Tang* dynasty and groups of *Han* immigrants migrated to the island. This resulted in

Box 5.1

Biodiversity in Chinese Home Gardens

Home gardens are typical examples of mainland Chinese culture. The composition of species and varieties vary greatly both among ethnic groups and between farmers within the same ethnic group. Every garden is a unique creation with a complex set of tree and crop species and animals. Mushrooms are often grown as well. Fish ponds are used to raise fish or high-value species such as eels and soft turtles. The operation and management of intensive home gardens require large-scale biodiversity and a high level of skills. These experiences could help other farming communities to develop strategies for on-farm conservation both in the Hindu Kush-Himalayan region and outside. Systematic documentation of such examples could add to knowledge of alternative methods for agricultural biodiversity conservation and management.

The common hypothesis is that crop diversity is associated with closed and subsistence farming systems because of the diverse needs of the people. Crop diversity declines with the increase in development opportunities, and interventions need to be examined in a wider economic, socio-cultural, and environmental context. There is considerable concern that commercialisation of agriculture has endangered crop biodiversity. However, the case may not be universal as demonstrated by the tradition of home gardens. This system maintains Genetic Diversity both to fulfill the farmers' own needs and to meet local needs. But the difference in production systems and the area coverage in each system, are important, mainly from the point of view of food security. The issue that emerges is that Genetic Diversity in commercialised areas depends on outside sources because commercial farmers always seek productive and profitable crops and varieties.

development of a feudal economy in migrant areas. During the Ming Dynasty (961-1911 A.D.) farmers on the mainland were encouraged to move into places where the population density was low and large areas of wasteland were reclaimed for agriculture.

The Impact of Han Migration on Li Farming

The *Li* community learned vegetable farming from the migrated Han community and started to save vegetable seeds. Traditionally, the *Li* mixed seeds of early maturing varieties of rice with those of late maturing varieties. The seedlings were raised in the same nursery bed and transplanted together. The early rice was harvested separately, but the cost and labour of transplanting late paddy were saved. The *Li* gave up this traditional practice when they saw *Han* farmers producing higher yields by transplanting the two crops separately. In contrast to the *Han* community, *Li* farmers only harvest the panicles of paddy crops and leave the straw in the field to improve nutrient recycling. They still use this harvesting method today.

Both communities benefitted from the process of social mixing. The *Li* community improved the efficiency of their agricultural tools and implements, cultivation practices, and lifestyle. They added new crop species into their farming system acquired from the immigrating *Han* farming families. New crops, trees, and some animals were also domesticated. In relative terms, however, *Li* farmers were marginalised because of their relatively poor technologies compared to those of the migrant *Han* communities. This caused displacement of large numbers of *Li* people to forest areas in search of uncompetitive agriculture. The *Han*, on the other hand, acquired some local crops of the *Li* people for farming.

Population growth in Hainan Island continued, as did the rate of reclamation of wasteland and deforestation for arable purposes. Even so, the unit area available per individual farming household decreased. A large number of local species and varieties was lost from the Island. There are two major reasons. First, under such land pressure farmers started looking for short-term economic benefits and ignored the impact on agrobiodiversity and the environment. Second, local government policy supported replacing local varieties with improved varieties. Table 5.1 shows some of the now extinct varieties of rice and groundnuts of Hainan Island.

Issues from the Case Study

This case study shows how the Genetic Diversity of indigenous crops and animals can decrease as populations migrate to new villages. Migrants bring with them a range of their own crops and animal species which replace the

Table 5.1: The Process of Agricultural Development and Replacement of Crop Varieties in Hainan Island

Crop	Years	Popular varieties	Extinct local varieties
Rice	1949-56	Gaochong, Hali, Mozu	Gaochong, Hali, Mozu
	1957-65	Anpu, GN-2, GC-13	
	1966-77	Guangan, Jinjuan, Muquan	
	1978-85	Ke-b, Baotatian, Bx-2	
	1986-94	Hybrid rice	
Cassava	1949-59	Malaya	Malaya Most local land races
	1960-77	Redtail, Greentail	
	1978-94	South China 205	
Peanut	1950-56	Traditional varieties	Most local land races
	1957-94	White oil-1	

traditional species and varieties. This process can lead to both replacement of local genetic resources and an overall increase in agrobiodiversity. This case study provides a beautiful example of how Genetic Diversity can be enriched by outside intervention as well.