

**Sustainability amidst diversity:
Options for rural households in Mali**

IER, IDS & IIED

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ACRONYMS

AV	Association Villageoise
BNDA	Banque Nationale de Développement Agricole
BPP	Bovine Pleuro Pneumonia
CFA	Communauté Financière Africaine
CFDT	Compagnie Française pour le Développement des Textiles
CMDT	Compagnie Malienne pour le Développement des Textiles
ECOWAS	Economic Community of West African States
IDS	Institute of Development Studies
IER	Institut d'Économie Rurale
IIED	International Institute for Environment and Development
OPAM	Office de Produits Agricoles du Mali
SAP	Structural Adjustment Programme
SYCOV	Syndicat des Producteurs de Coton et de Vivrières
UEMOA	Union Économique et Monétaire Ouest Africaine

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INTRODUCTION

This summary report presents the results of research into sustainable rural livelihoods carried out in two villages in Mali during 1997–98. A more detailed research report is also available (Brock and Coulibaly 1999). The research was part of a broader programme, led by the Institute of Development Studies, and funded by the UK's Department for International Development (DFID). Following a presentation of the framework used to analyse the case study material, Section 1 goes on to describe the complexities of local livelihood systems in the two villages chosen for the research. This places particular emphasis on differences between those households whose livelihoods are seen as sustainable and those less able to make ends meet. Section 2 discusses the research methodology used and section 3 introduces the agricultural systems of the two villages. Thereafter, an overview of Mali's recent history is presented to show how this has affected the evolution of agriculture and rural livelihoods. Next, we discuss in more detail local institutions, agricultural intensification, livelihood diversification and migration strategies. The last section summarises the implications of this research for several key policy areas.

Sustainable rural livelihoods

The concept of 'sustainable livelihoods' has become increasingly important in the debate about rural development, poverty reduction and environmental management (Scoones 1998). Livelihoods are taken as comprising:

'the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base.' (Scoones 1998)

A livelihoods perspective encourages a broader understanding and examination of those factors, institutions and processes which help explain the differing success with which rural households make a living. As a result, it permits a bringing together of more sectoral approaches which tend to focus on a single aspect of rural livelihood systems, to create a more holistic understanding of the options and trade-offs facing different groups.

A livelihoods approach aims to answer questions such as:

- Who can achieve a sustainable livelihood , and who cannot?
- What resources, institutions and strategies are important for enabling or constraining the options open to different groups of people?
- What practical, operational and policy implications stem from adopting this approach? (Scoones 1998)

In order to do this, the sustainable livelihoods approach takes a framework which combines analyses of:

- The broader context, conditions and trends (which include agro-ecological factors, demography, history, macro-economic conditions and power relations);
- The range of livelihoods resources available (land and other forms of natural capital, financial assets, human skills and social capital);
- Institutions and organisations which provide the means by which people gain access to different kinds of resource (such as customary tenure regulations, the organisation of formal credit systems, and patterns of settlement, household organisation, and marriage);
- Livelihood strategies (which include migration, diversification into a range of activities, and intensification of agriculture);
- Outcomes to assess the extent to which particular of welfare have been improved in a sustainable fashion (such as reduction in poverty, increased food security, greater resilience within the farming system).

The case study sites

Mali is a landlocked country, stretching from the Sahara in the north to the cotton-growing region of the south. It is one of the poorest countries in the world, with per capita income of about US\$250. There are three main farming systems which comprise cotton growing in the south and west of the country, rice grown mainly within the irrigated lands of the Office du Niger and rainfed cereals. Livestock play an important role in each of these systems providing draft power, manure, milk, meat, and a means of accumulating wealth. The village of Zaradougou was selected to represent the cotton-growing region of southern Mali, while the village of Dalonguebougou represents the rainfed millet region. The choice of Dalonguebougou as a study site allowed for an analysis of change over the last 18 years, given the availability of data from research carried out in 1980–82 (Toulmin 1992).

Zaradougou is mainly inhabited by Sénoufo farmers, with two households of other ethnic groups settling in the village only recently. In Dalonguebougou, by contrast, there are four distinct groups: 'village' Bambara, 'visiting' Bambara who are resident only during the cropping season, as well as Fulani and Maure, who come from a livestock herding background.

Rainfall in both areas is erratic and seen by farmers to be declining. Average annual rainfall is at present around 1000 mm in Zaradougou and 500 mm in Dalonguebougou, falling in a single rainy season. Both villages are located in relatively flat areas at between 250 and 400 metres above sea level. Wind erosion is common in the dry season, particularly in Dalonguebougou.

In Zaradougou, slopes are not steep but run-off on certain fields is considered a problem by farmers. Soils at the top of the catena are dominated by gravel, often shallow and with a laterite layer, while loam and clay increase further down the slopes. The small valley bottoms (*bas fonds*) are clayey. Farmers in Zaradougou identified eight types of soil according to physical characteristics and their utility for different crops. Any single field may contain a range of different soils. The longest-established households generally have fields on those soils which are perceived as better for cultivation, whilst the fields of newer arrivals and individual women tend to be located on more marginal soils. All households resident in Zaradougou have various fields in different locations.

Dalonguebougou has mostly light sand and gravel soils. Within the village territory, farmers identify a number of different soils ranging from uncultivable gravels and laterite pans, to several clay/sand combinations of soil suitable for cultivation. Clay and gravel soils are said to have produced high yields during periods of regular and heavy rainfall, such as in the 1950s and early 1960s, while the sandy soils have become the most sought after today. These preferences reflect local perceptions that rainfall has declined over recent decades (Toulmin 1992).

In Zaradougou, eight wells and two hand-operated pumps meet drinking water needs throughout the year, and water animals during the dry season. Villagers consider that their water needs are adequately met. In Dalonguebougou there are five hand-pumps in the centre of the village used for domestic purposes. All households not living in the central village settlement have to make frequent round trips (often as far as 14 km) to the pumps to collect drinking water. The fifty-six wells, situated in the village field zone, are mostly privately owned by village Bambara households, who negotiate dry season

access to this water with other users. Before Independence, only the village chief had the right to dig wells in the village territory but, with the change in the law in 1960 which allowed all Malians the right to freely exploit land and water resources, most village households have now dug one or several wells of their own. However village Bambara maintain a *de facto* veto on any other group wishing to dig a well in the village territory. This stance has become a considerable source of conflict, particularly between the village Bambara and the Maures, as human and animal populations have risen.

Zaradougou is only 30 km from the regional capital Sikasso and lies close to the tarmac road linking Bamako with Sikasso. Dalonguebougou is more isolated, particularly during the wet season. A dirt track links the village to the tarmac road 35 km away connecting Niono with Ségou. Social infrastructure is limited in both villages. The nearest health centre is, in both cases, more than 25 km away. Villagers in Zaradougou have just started their own school offering four years of primary education; they pay the salaries of the teachers. There is no school, however, in Dalonguebougou, the nearest one being in a village 25 km away. As a result none of the children attend school, although for several years a couple of villagers who had been trained as literary teachers ran a series of classes.

Table 1 Characteristics of the two villages

	Zaradougou	Dalonguebougou
Location	30 km north-west of Sikasso	60 km north of Ségou
Annual rainfall	900-1100 mm (sub-humid)	400-600 mm (semi-arid)
Number of households	16	35 (village Bambara)
Total population	566	1,826 (all actor groups)
Population density	30 persons per km ²	11 persons per km ²
Agricultural system	cotton-cereals/ livestock	millet/livestock
Distance to large market	30 km to Sikasso, daily market (tarmac road)	40 km to Dougabougou, weekly market (dirt track)

METHODOLOGY

The research was carried out using an analytical framework to examine the institutional arrangements through which different people can gain access to the bundle of different types of capital (natural, physical, human, economic and social) necessary to construct a livelihood. Livelihoods in these two villages were analysed in terms of their three main components: agricultural intensification, livelihood diversification and migration (Scoones 1998). A strong historical perspective was taken, emphasising the importance of understanding livelihoods in the context of change.

A diverse methodological approach¹ was pursued. It included a week-long rapid rural appraisal followed by many semi-structured interviews on specific areas of interest with groups and individuals, including the extension services. A population census and other focused surveys were carried out in both villages. Time series aerial photos were collected for both sites and analysed to show changing patterns of land use. In Dalonguebougou, field areas for a sample of farmers were measured and millet production estimated. Regional level data were collected on climate, prices and populations and various libraries in Mali were consulted for historical documents and other literature.

Sustainability Ranking

Establishing an appropriate Sustainability Ranking was an essential part of this research, and carried out gradually over the nine-month period of fieldwork. First, indicators of what constitutes sustainability were discussed with villagers, who identified the unit of sustainability as the household. The indicators of household sustainability selected by villagers were remarkably similar in both villages. In Dalonguebougou, *gestion*, *main d'oeuvre* and *bétail* were the three factors considered most relevant. *Gestion* refers to the way in which a household is managed, and it was consistently felt that good management of household labour and resources was the most important criterion for 'household sustainability.' *Main d'oeuvre* refers to the household labour force, and encompasses characteristics such as size, age and gender balance. *Bétail* refers to livestock holdings, and reflects the importance of animals as assets and as insurance against risk and shock. In Zaradougou, the criteria were *gestion*, *moyens* and *structure*. *Gestion* was used in the same way

¹ The methods used in Dalonguebougou are discussed in more detail in Brock 1999.

as in Dalonguebougou. *Moyens* refers to the ownership of a range of assets, including agricultural equipment and animals. *Structure* refers to the demographic structure of the household, and is similar to the understanding of *main d'oeuvre* in Dalonguebougou.

Once these criteria had been arrived at, we began to have more informal conversations with a range of informants to rank households according to these indicators. This information was supplemented by the experience and understanding of our two research assistants, who by this time had been living in the village for nine months. Households were ranked in three classes through a highly iterative process which drew on the opinions and knowledge of many people.

Table 2 Ranking of households

	Zaradougou	Dalonguebougou
Group 1 (high)	36%	21%
Group 2 (medium)	30%	18%
Group 3 (low)	34%	61%

The rankings presented above should not be taken as strictly comparable between the two villages, since they represent perceptions of relative sustainability within a single community. The relatively high figure for Dalonguebougou of households considered to be of low sustainability is likely due to there being several households which had recently split into smaller domestic groups, with its attendant risks and difficulties.

AGRICULTURAL SYSTEMS

Zaradougou

The agro-ecosystem in Zaradougou is based on the production of cotton, cereals, fruit and livestock. Although maize (*Zea mays*) and other cereals provide the staple food, households focus many of their resources on the production of cotton (*Gossypium spp*), which is cultivated in rotation with cereals. Mineral and organic fertilisers are applied directly to cotton, with cereals benefiting from the residual effects of fertiliser in the second and third year of the rotation. In some cases mineral fertiliser is also directly applied to maize. Sorghum (*Sorghum bicolor*) and millet (*Pennisetum typhoides*) are

frequently intercropped with a legume, such as cowpea (*Vigna unguiculata*). Groundnuts (*Arachis hypogaea*) are principally grown by women on their individual fields, both for sale and for their own consumption. Some households have very small plots in the *bas fond* area close to the river where they cultivate vegetables in the cool dry season, and small plantations of fruit trees – mango and orange – are also found in this zone. In addition, some households have planted orchards on fields formerly used for cultivating cotton and cereals.

Animals, particularly donkeys and cattle, play a central role in livelihoods for Zaradougou households. Cattle are particularly valued for their manure as a means to maintain soil fertility and draft power. Three households own no oxen and cultivate largely by hand, supplemented with the occasional loan of oxen and equipment. Farmers in Zaradougou refer to an outbreak of lung disease likely to be Bovine Pleuro Pneumonia, which ravaged their cattle holdings in the mid-1990s, leading to losses ranging from 50 per cent to 70 per cent of total herd size.

Human population density in the region was estimated at 30 inhabitants per km² in 1996 (Bosma *et al.* 1996). There is still arable soil within the village's territory which is not under cultivation (albeit of relatively poor quality), despite the fact that most households cultivate the maximum area possible with the available labour. The continued existence of uncultivated land in a region which is becoming increasingly farmed can be explained in several ways. Most households have second farms in Ivory Coast which require a large proportion of their active labour force. Other reasons may include the relatively large area claimed by the village, and the success of villagers in discouraging migration into the village from elsewhere.

Dalonguebougou

The agro-ecosystem in Dalonguebougou is based on the production of millet and livestock (cattle, donkeys and small ruminants). Although millet is the staple food crop, most households also produce a surplus to trade for other goods. Millet, usually intercropped with cowpeas, is grown both on heavily manured fields close to the village where there is no rotation or fallow, and on large fields further away from the village with little or no fertiliser on the basis of bush fallow rotation. Groundnuts and Bambara groundnuts (*Voandzeia subterranea*) are the most important of several secondary crops.

Animals are a crucial component of the agro-ecosystem, providing milk, meat, manure, draft power, income, savings, transport and status. Cattle are the

most common type of livestock. Ownership of many cattle is an indicator of wealth, but access to (and preferably ownership of) at least one pair of draft oxen is central to most livelihoods. Cattle are pastured in the village territory throughout the year, and are kept in the compound only in the case of illness, pregnancy or occasionally, in the case of draft oxen, for supplementary feeding at ploughing time. Many households say their herds are still recovering from an outbreak of cattle disease in the early 1990s.

Changes in both human and animal populations have had a significant impact on the dynamics of the agro-ecosystem. Although human population density is low, approximately 11/km², this represents an increase from the 7/km² noted by Cissé and Hiernaux in 1984. The increase in population is one factor which is putting a strain on institutions regulating access to land and water. Changes in human population vary across the different actor groups. The large growth in numbers for the Maure and visiting Bambara can be explained by a large increase in the number of people seeking land to farm. Since 1981, the village Bambara population has only accepted two small in-migrant households for permanent settlement, and their effect on the growth factor is negligible. The total number of households has also remained largely stable for the Fulani community.

KEY EVENTS AND THE HISTORY OF POLICY INTERVENTIONS

The period of French rule

Dalonguebougou was settled during the late seventeenth century as a fortified settlement on the perimeter of the Bambara Kingdom, based at Ségou. Zaradougou was founded during the reign of Babemba Traoré, the last king of Sikasso before the French defeated him in 1898. The French consolidated their administrative hold on the country following its conquest and 'pacification in the 1880s and '90s, and brought with them great change. They imposed taxes, (thus gradually but firmly establishing a monetary economy), forced labour, military conscription and a legal system. They also established an administrative system which imposed the new institutions of *chef de canton* and *chef de village* over the existing ones to allow the collection of taxes from the population. The echoes of this change can still be discerned in contemporary structures of power at village level.

Forced labour and military conscription took young men away from the village, for major public works and road building programmes. During the

1930s, young men first began to migrate to Senegal and Ivory Coast to work in order to earn the money needed to pay taxes. This necessity came about in large part due to extremely poor harvests throughout the 1930s and persistent plagues of crickets and grasshoppers.

The experience of colonialism transformed southern Mali in profound ways so that agriculture, the organisation of labour and the local economy were all radically altered by the time the French departed sixty years later. At the turn of the century, rural livelihoods were centred around agricultural production within the structure of complex extended households. Agriculture was based on the hoe and fallowing of land. Grains such as millet, sorghum and rice were produced and local varieties of cotton were cultivated for making cloth. Livestock played an important role in the structure and institutions of S enoufo culture (Diabat e 1986) but were not actively integrated with agriculture.

A new phase of the colonial economy began after the First World War, when France became increasingly aware of the need to secure supplies of cotton for industry. Cotton was first exported from Mali in the 1920s, and agricultural policy has been dedicated to maintaining its production ever since. From 1920 until 1947, the French forced farmers to cultivate cotton by demanding that a part of tax be paid in cotton, and initially also imposed a communal field of cotton (Rondeau 1980). The extension service, established in 1923, was principally designed to 'modernise' cotton production, and to force the introduction of ploughs. Towards the end of the Second World War the forced introduction of ploughs, forced labour and the obligatory cultivation of cotton were all abolished. The period of direct state intervention of agricultural production was coming to an end, to be replaced by operation through the French parastatal *Compagnie Franaise pour le D veloppement des Textiles* (CFDT), which was established in 1949.

Lands north of the River Niger like those of Dalonguebougou were defined as low potential in the colonial period and not subject to direct intervention to grow cash crops. Yet, French activities had a direct impact on agriculture in Dalonguebougou. *Soci t s Indig nes de Pr voyance* (SIP) were initially established all over the French Soudan – including the dryland regions – in the first decade of the 1900s, as banks for seed (Crowder 1976). Gradually the SIPs grew into compulsory-membership 'co-operatives' which administered grain banks (ostensibly for the purpose of establishing famine reserves, but requisitioned at the outbreak of war to feed the troops) and, by the 1930s, had set up credit schemes for the supply of animal-drawn ploughs and carts to farmers (Toulmin 1992). The grain bank function of the SIPs caused great

resentment, and meant that many farmers' first experience of agricultural credit came under the auspices of an institution which had already proved its untrustworthiness. This meant that in Dalonguebougou no-one took up the credit offered for ploughs and carts, and it was thus not until the 1950s that the first ploughs, paid for outright with migration earnings and livestock sales, arrived in the village (Toulmin 1992).

From Independence to the Third Republic (1960–1991)

Independence was gained in 1960 and brought in the socialist regime of Modibo Keïta, with its commitment to state control of marketing and monopolistic public enterprises. In 1968, Moussa Traoré took power by means of a *coup d'état* which was the start of 23 years of dictatorship.

One of the most immediate direct effects of Independence in 1960 for Dalonguebougou was the enactment of legislation which gave free access to land and water for all Malians. Although this did little to change the local *de facto* control over the distribution of land for cultivation, in Dalonguebougou it did result in most village Bambara households breaking the former monopoly of power held by the village chief and exercising their right to dig wells. Fulani and Maures meanwhile lacked the real power to be able to exploit their legal rights in this way. This change in the law had no observable impact in Zaradougou.

During the Keïta regime (1960–68) economic policies established state control over the marketing and distribution of certain agricultural products, amongst them millet. From 1965 until 1982, the *Office de Produits Agricoles du Mali* (OPAM) administered a national system of purchasing grain quotas from every village at a fixed price, in the immediate post-harvest period (Toulmin 1992). From the early 1980s, however, cereal markets have been progressively liberalised as part of a broad range of economic reforms agreed with the IMF, World Bank and bilateral donors, bringing a shift in policy away from state interventionism and towards the development of a mixed economy.

In Dalonguebougou, this process of liberalisation has meant a move away from the clandestine millet sales and fulfilment of grain quotas to the state, in favour of the sale of millet to visiting merchants who buy grain in large quantities to sell in the markets of Ségou, Bamako and Mauritania. It has also

brought a heightened awareness of the seasonal and annual fluctuations of millet prices.

The Malian government took a majority shareholding in the CFDT in 1974 and renamed the parastatal organisation as the *Compagnie Malienne pour le Développement des Textiles* (CMDT)². It subsequently became increasingly responsible not only for cotton, but also for broader rural development activities in southern Mali.

Mali's first Structural Adjustment Programme (SAP) began in 1984 and focused on selective liberalisation of markets for agricultural products whilst maintaining import controls for certain crops such as rice (INRA 1991). Structural adjustment was accelerated in 1988, with a far greater emphasis being placed on reforming parastatals and State rural development institutions. The Ministry for Rural Development (MDRE) was gradually restructured and a process of devolving many of its functions to regional level was begun, which continues to the present. Structural adjustment also brought with it rationalisation and downsizing of parastatals and government agencies, but the relative isolation of Dalonguebougou meant that this had little impact on the day-to-day lives of the villagers who had never had much contact with service provision. This was different for people in Zaradougou because of their longer and closer involvement with markets and development activities, led by the CMDT.

The combination of economic and political factors resulted in cotton farmers becoming increasingly resentful of the CMDT during the 1980s. They also complained of increasing corruption amongst CMDT staff, who had seen their wages fall (Degnbol 1996). A side-effect of the second Structural Adjustment Programme, in 1988, was the transfer of the administration of agricultural credit to the National Agricultural Development Bank (BNDA), another move which was unpopular with farmers who saw it as a more restrictive lending structure.

The Third Republic: 1991 to present

The government which came to power in 1991, overthrowing the military dictatorship of Moussa Traoré and replacing it with an elected president and political parties, has continued the process of liberalisation and privatisation. With the re-establishment of a democratic system after more than two decades of single party rule and centralist government, national civil society has

² The CMDT took over from the CFDT on Independence.

prospered. The democratically elected government since 1992, under the presidency of Alpha Konaré has been following a broadly liberal pro-market economic policy, in line with the requirements of the IMF and World Bank. The government is considered to have achieved substantial economic and political reform and has attracted considerable interest and funds from the main donor agencies. A process of administrative decentralisation is under way, and elections for rural communes took place in May/June 1999. Decentralisation potentially offers many opportunities for promoting local community development and more effective land management through local level bodies. A revision of land and pastoral tenure legislation is also taking place.

The change in regime has also seen an unprecedented opening up of political discussions between farmers and the CMTD. A series of farmers' grievances was presented to the CMTD in 1991, shortly before the uprising that deposed the Moussa Traoré regime. Initially the CMTD did not react which resulted in serious confrontation. However, by 1994 the farmers' union, the *Syndicat des Producteurs Cotoniers et Vivriers du Mali* (SYCOV) had become a full partner with the CMTD and the government in negotiations over fixing input and cotton prices³.

The devaluation of the CFA (Communauté Financière Africaine) in January 1994, imposed by the multilateral financial institutions, was undertaken by all member states of UEMOA with the aim of restoring the trade balance. The consequent alteration of Mali's terms of trade on world markets had a considerable and widespread impact on the country, by doubling the price of many consumer goods overnight before any benefits in the form of increased income had a chance to trickle down. For cotton growers in Zaradougou, the cost of fertiliser doubled, and fertiliser use fell in the season immediately after devaluation. It recovered slowly in subsequent years as the devaluation and other reforms raised the prices received by producers for their cotton. (Giraudy and Niang 1996). The devaluation had less impact on Dalonguebougou, but did precipitate a brief flurry of investment in capital goods by richer members of the community in the period immediately prior to devaluation, which villagers had heard about on the radio.

On balance, in the period following the devaluation, the returns to cotton seem to have improved, given favourable world market prices, as can be seen by the considerable increase in cotton production in the last few years. Mali is now

³ The SYCOV leadership is, however, seen by many as having been at least partly co-opted by the CMTD.

the second most important producer of cotton in Africa, outside Egypt. Devaluation also served to increase the export of cereals, vegetables and livestock to neighbouring countries, especially Ivory Coast. As far as livestock are concerned the major increase in demand from coastal states for Sahelian animals was due to the combined effects of meat imports into the CFA franc zone becoming more expensive, and agreement from the European Commission to cut back on dumping of cheap, frozen meat on West African markets. Overall, the CFA franc devaluation shifted the terms of trade between town and country, rewarding producers of food, cash crops and livestock at the expense of higher prices for those needing to buy these commodities. The impact on poor rural households in Mali thus has depended on the extent to which they must purchase food and are dependent for their income on a salary.

LOCAL INSTITUTIONS

Local institutions mediate access to the different forms of capital necessary to gain a livelihood. In both villages, the majority of the population live in large complex households often containing three or four generations of male kin with their wives and children where all members of the household cultivate a common field and eat from the same granary. Individuals may also farm small plots in their spare time. Average household size ranged from 22 people in Dalonguebougou to 30 in Zaradougou, the smallest households containing 2–3 people, while the largest were made up of 70 or more. According to local perceptions of sustainability, the household is the single most important institution in the achievement of a sustainable livelihood. The structure of the household and its internal organisation have evolved in each village to take advantage of opportunities provided by both the local and broader political and economic context.

In Zaradougou most households cultivate a coffee or cocoa plantation in Ivory Coast, in addition to their farmlands in Mali. The complex household provides in many cases a successful structure for managing this very diverse agricultural enterprise and ensuring secure livelihoods for their members. But for others, the tensions created by conflicting interests and personalities are impossible to maintain within the household, leading to fragmentation and increased vulnerability. In Dalonguebougou, the complex household has also shown remarkable resilience as an institutional form, managing the complicated livelihood portfolios of large numbers of people and largely

succeeding in assuring their food security, even in drought years⁴. However, here also households may break up when it is no longer possible to manage the competing demands of different sub-groups within the larger domestic unit.

In both villages, households of the same ethnic group are linked by age-group associations in a relationship of mutual aid which will last throughout their lives. These horizontal networks are stronger in Dalonguebougou than in Zaradougou, in part due to differing patterns of migration. In Dalonguebougou, migration is usually seasonal and although it provides an income for a significant period of most people's lives, the majority of migrants return to the village every rainy season. In Zaradougou, where the average time away on migration to the family farm in Ivory Coast is six years, age group associations have become weaker.

Zaradougou has a number of different groupings or *tons* based on the traditional institutions of Sénoufo culture, organised along lines of kinship, location, and gender; similar groupings also exist among the village Bambara in Dalonguebougou. Some like the youth association, *La Jeunesse*, in Zaradougou, are a source of credit to households in cases of socio-economic distress, while the main activity of the *ton* in Dalonguebougou is to organise a large dry-season festival. *Tons* also helped with the payment of fines which were frequently levied by the forestry service before the change of government in 1991. Funds are raised by hiring out the labour of its members as a workgroup to anyone who needs extra labour on their household fields and has the money to hire it. Smaller groups also form around the reciprocal exchange of labour, such as when the young men from two households provide each other with weeding labour on a mutual basis. Zaradougou households have taken this institution with them to their plantations in Ivory Coast.

Zaradougou is unusual in that the traditional leadership structure or *chefferie* has lost much prestige so that the most important internal organisation identified by the villagers is now the *Association Villageoise*. The creation of village associations (AVs) in the 1970s was encouraged by the CMDT to provide an institution to deal with the relationship between cotton farmers and extension agents. The Zaradougou AV was created in 1985 and its current activities are principally related to the marketing of cotton, the dissemination

⁴ These examples from Mali run counter to evidence from elsewhere in West Africa which tends to show a shift towards smaller domestic units based on the nuclear family. The break-up of large Hausa family structures in Nigeria is attributed to the decreasing ability of family heads to meet the domestic responsibilities they traditionally assured their members (Hill 1972; Solivetti 1994).

of extension messages and as the gateway through which extra-village institutional relationships are conducted. The AV is the only village organisation which has access to external funds, generated by the sale of cotton to the CMDT, and dedicated to investments for the village. Any outside intervention with a financial component is channelled through the AV. In common with many others, the Zaradougou AV has experienced financial management difficulties: 'quite substantial amounts are controlled by the AV management and the temptation to abuse this influence is obvious' (Degnbol 1997). Dalonguebougou, by contrast, has never had an AV and therefore the customary institutions of resource tenure and mutual aid dominate at the village level.

Local politics in both villages are dominated by those who can trace their lineage back to the first households which settled there. By tradition the first settlers made an agreement with the local spirits whereby good harvests could be reaped in exchange for regular sacrifices and libations. The position of land chief (*or chef de terre*) continues to be important as the formal link between the farming community and the spirit world. In Zaradougou, where there are two small immigrant households in a village of Sénoufo farmers and where cultivable land is still available, the customary system of access to land, grazing, water and common property resources functions largely without problems. Dalonguebougou, by contrast, has seen the number of people farming land within its territory more than double in twenty years due to seasonal and permanent immigration. Customary institutions governing access to land and water have been placed under strain, and the Bambara villagers' rights to control access to water have increasingly been contested.

AGRICULTURAL PRODUCTION

Zaradougou

For the cotton producing farmers in Zaradougou, agriculture has followed a process of intensification based on credit provision for external inputs (fertiliser, pesticides and herbicides) to maintain or increase productivity, and methods of integrating crops and livestock to restore and maintain soil fertility (use of manure, draft power and transport, fodder crops). Those households which were given a higher sustainability ranking can afford to pursue this model of agricultural production, funded in part by successful management of their Ivory Coast farms and, in part from diversification activities (small businesses, trade and transport). Those households seen as least sustainable

are usually restricted in their access to one or more types of capital and may have become indebted to the CMDT. They are thus unable to intensify their production along the lines recommended by research and extension. The economies of these households tend to be more diversified in terms of the number of sources of income, but such activities tend to be pursued by individuals, require little financial investment and provide low returns (sale of products from common pool resources, agricultural labour).

In general, the area per worker under cotton for all households in Zaradougou is expanding, a trend which farmers confirm as part of a long-term trend to increase cotton output. The exceptions are mostly households experiencing problems with internal management. The increase in area of land under cultivation may also be attributed to population growth and the insecure land tenure situation as a result of political reforms. Occupation of 'empty' land has become a strategy for claiming 'possession' as illustrated by the settlement of immigrant households on an area of land contested with a neighbouring village. At household level, increasing the size of fields is a strategy to secure access for future generations of the household.

The relationship between intensification and extensification in Zaradougou is complex. The factors influencing farmers' decisions to invest labour and capital in cotton and cereal production arise from both the micro-level concerns of household management and the impacts of broader events and policy changes, beyond the control of farmers: such as the price and availability of inputs, the price of cotton, livestock disease outbreaks, and tenure security in Ivory Coast.

Dalonguebougou

In Dalonguebougou, there is a complex mixture of agricultural sub-systems, with each actor group pursuing a slightly different range of agro-pastoral livelihood activities. Several trends in crop-livestock integration in Dalonguebougou can be identified. Farmers have increased their overall production, particularly of the main crop millet, in order to feed a growing population and generate a surplus for sale. They do this through increasing the area cultivated and the use of manure to maintain soil fertility in those areas where fallowing is not possible. Small quantities of mineral fertiliser are now also being applied by some farmers. Herders have diversified into farming to increase the stability of their livelihoods. Within the village area, there are several distinct paths being followed depending on the rights of access which each group has to key resources.

Access to key productive assets – water, land, manure and draft power – is negotiated by actor groups through a series of overlapping, flexible institutional arrangements. The result is an agricultural system which encompasses a variety of strategies which range from intensive, long-term cultivation of short-cycle millet on heavily manured village fields, to cultivation of long-cycle millet on large bush fields with a rotating fallow. Those households perceived as more sustainable either have secure access to the entire range of capital assets needed to maintain their agricultural production⁵ or the potential to exchange the capital they have for the assets they need. Thus, the most vulnerable group in the village are seasonal migrant farmers, who have only conditional access to land, water and draft power, and own few of the material or social assets they could exchange for greater security of access.

The village Bambara are the only actor group who cultivate both village and bush fields. For them, agricultural intensification can be characterised by the interaction between two sub-systems which use resources in different ways, and have changed over time. The last twenty years have seen a shift in priorities away from investing resources in manuring village fields towards investment of capital and labour in bush fields. Currently, less manure is used on the village fields than in the early 1980s because of the changing terms of water exchange contracts. Since that period, many households have also begun to use small amounts of mineral fertiliser on their bush fields. Increasing tension around water exchange contracts and the possibility of tenure reforms have made expansion of bush fields a preferable option for those who have adequate financial and human capital. Other households whose choice of investment strategy has been reduced by the loss of animals to disease have been able to expand their bush fields, through the exchange of water for draft power, with visiting herders.

Concentrating investment in bush field cultivation is now seen by many households as their best option for maintaining or increasing harvests, but the reasons for this vary from household to household. Increased bush field yields are associated with an increase in labour use per hectare, while the fall in village field yields has occurred due to a fall in fertility levels while there has been no major change in labour use. This suggests at the village scale that the manure-based intensification of the village fields which took place in the 1980s has given way to an intensification of labour inputs into the bush fields.

⁵ This often includes access to the remittances made to the household by dry-season migrants.

Many households with a higher Sustainability Ranking and a wider margin of choice about farming strategy are choosing to maximise the area of their bush fields, even if it means hiring oxen to top up their own holdings. Those households which are impoverished in terms of human and financial capital have fewer options for changing their strategies in this way. Loss of animals to disease and the development of a cash market for draft power have made expansion of bush fields more costly: for example, at 1998 prices, hiring a pair of oxen for the ploughing period for two years cost the same as purchasing a single ox. Households with no savings or regular source of income can afford the smaller annual rental but find it hard to raise the money that would be necessary for an outright purchase. The other option of increasing village field fertilisation, demands dry-season labour, to dig or deepen a well and, in small or poorly managed households, this may result in a trade-off between dry season migration or investment in the farm. Attracting a visiting herd to manure the land is also now felt to be an increasingly risky investment because of water shortages. Less sustainable households therefore face serious constraints to increasing agricultural production strategy.

Access to water, and the changing relationships surrounding it, are central to understanding different pathways of agricultural intensification. Water for livestock during the dry season is a relatively scarce and increasingly contested resource. It is through the control of access to water that the village Bambara maintain their power. During the earlier period of research in 1980–82, contracts whereby village Bambara farmers exchanged their well water for the manure from visiting herds were the norm. The situation has changed substantially since that time, towards a growth in the number of contracts in which access to water is exchanged for draft power to help with ploughing. This change can be attributed to loss of cattle from disease and the expansion of bush fields amongst the village Bambara. Maures also make no secret of the fact that they prefer water-draft exchanges, if they can find them, so they can take their animals farther afield in search of good grazing during the dry season without having to bring them back each night to manure the well-owner's field⁶. It also means that the Maure's herd can spend some time manuring their own fields. Many Bambara households have experienced a loss of soil fertility on their village fields due to this shift in the terms of watering contracts. However, a good relationship with a Maure household can help Bambara farmers maintain the fertility of their village field by their

⁶ If a herder is exchanging draft rather than manure, there is no obligation to stay on the farmer's field overnight, which during the dry hot season can give him the opportunity for his animals to set off during the night and arrive at pasture before the heat of the day drives them towards the nearest shade.

establishing their tent and flocks on the well-owner's field for a period. Friendships are not uncommon, and build on other economic links between village Bambara and Maure households, with the Maures using village shops and mills and often trading livestock for grain.

For herders, changing patterns of crop-livestock integration have made their livelihoods somewhat more stable. They are now less likely to rely on a single source of income, and cropping makes an increasingly important contribution to household food supply (more so for the Maures than the Fulani). Further research would be required to examine the changes in their herd size and patterns of investment in different income-generating activities.

Generally, crop-livestock integration has increased the overall sustainability of livelihoods in the village through strengthening reciprocal relationships between groups, whilst still allowing people to gain a livelihood through their preferred expertise. The visiting Bambara are least able to integrate crops and livestock in their livelihood activities due to their exclusion from secure firm rights to cultivable land, pasture and water. They constitute the most vulnerable group using the village territory. If, however, they were to secure access to land and water, there would be losers in other parts of the agro-ecosystem. For example, if the visiting Bambara were to bring their herds to water and graze around Dalonguebougou throughout the dry season, this would impose much greater pressures on both water and grazing, to the detriment of all. This poses an important question: can the livelihoods of poorer, more marginal groups be improved without damaging the interests of others, or is there no 'win-win' solution?

THE RANGE OF DIVERSIFICATION ACTIVITIES

Zaradougou

Livelihood diversification is an important household strategy in Zaradougou. Although for most households, cotton and cereal production are the major source of income, other activities play a significant role. The main form of diversification is the ownership of coffee and cocoa plantations in the Ivory Coast. These have a complex social and economic part to play in livelihood strategies, as well as spreading the risk of crop failure. In addition, there is a wide range of individual and household activities which generate income and contribute to the sustainability of livelihoods. Diversification activities can be classified according to who carries them out, and upon what type of capital the

activity depends. To draw conclusions about the role of diversification in the household economy, it is essential to understand the complexity of household structures. The contribution made to sustainability by diversification depends, in part, on where and how the profits from that activity are invested, on who is carrying out the activity and for what ends. The style of management and structure of the household help determine how diversification revenues fit with other strategies.

Formerly, it was rare for individuals to pursue their own income-generating activities and build up personal wealth, with all income accruing to the common household purse. Individual income-generating activities are seen as likely to contribute to the breakdown of the extended household, and are consequently frowned upon. Many household heads in Zaradougou express anxiety about the extent and spread of individual activities. For others, however, particularly younger men in an extended household, the possibility of earning some cash through individual activities may act to ease frustration. The household head needs to seek a balance between individual and household interests.

Household heads were asked to rank their different sources of household income in order of importance for the year 1997–98. Most Group 1 and Group 2 households (see Table 2) mentioned cotton or the plantation in Ivory Coast as their main source of income. Cotton was less important for Group 3 households who relied on plantation income or the orchards as their most important source of income. Thus, activities which began as a means of diversification have become the basic source of income for those households unable to meet the costs of inputs for cotton production (two households in Group 3 have large debts with the CMDT). The two immigrant households compensate for their lack of access to orchards and plantations by pursuing a wider range of activities than most of the other village households, based around sales of labour and of common property resources, such as firewood. In both cases, this range of activities is facilitated by their proximity to the tarmac road which leads to Sikasso.

In Zaradougou, social capital is as important as financial capital in gaining access to key resources for diversification, such as orchards. A household can be relatively 'poor' in financial terms but, because of their household history, have access to a means for diversification that others in a different social position do not. It is also important to recognise that, although class 3 households diversify their incomes with a narrower range of activities than

those in class 1, their diversification activities form a more important proportion of their income than that of their wealthier neighbours.

There was no clear link identified between diversification and credit. Only two farmers said that they had used formal credit, in both cases to buy a tractor. Villagers were unwilling to discuss informal credit openly. Providing more flexible finance and credit is perhaps most valuable for more vulnerable households, like those in class 3, who often lack the necessary labour and capital to make cotton farming profitable.

Migration and, in particular, the social and economic role of the plantations owned by villagers in Ivory Coast, are central to livelihoods in Zaradougou. All but three households own at least one plantation in Ivory Coast which are principally geared to the production of coffee or cocoa as cash crops. A wide range of secondary crops are also grown there, such as maize and rice for subsistence, as well as sweet bananas, plantain, manioc, avocado, oil palm, pineapple and kola nuts.

The process of acquiring what amount to second farms in a different agro-ecosystem began in the early 1950s and still continues today. The development of migration from Zaradougou to establish plantations in Ivory Coast has depended heavily on kinship networks, and has been further encouraged by the lack of economic opportunities within Mali. In the 1960s, poor economic growth in Mali led many migrants to travel to Ivory Coast, which was experiencing a boom in the export of coffee and cocoa at that time. Equally, the droughts of the 1970s and 80s provided a further push, with many Sahelian farmers and herders seeking their fortunes further south.

Movement between West African countries is facilitated by a regional agreement signed by all ECOWAS member states, including Mali and Ivory Coast, which allows people to cross the border with only an identification card and vaccination certificate. In addition, Ivory Coast has had a remarkable history of welcoming migrants, which can be linked to the economic boom of the 1960s and 70s and a shortage of indigenous labour during the same period. It was further strengthened by the ideology of Ivorian President Houphouët-Boigny who was in favour of the free movement of all citizens within the West African region (Dozon 1995; Winter 1997), and allowed immigrants to vote. However, this welcome altered radically at the end of the 1980s, when the Ivorian economy fell into recession and a Structural Adjustment Programme was introduced. The president's death in 1993 was rapidly followed by a change in the law which now allows only Ivoriens to vote (Dozon 1995).

Migration to Ivory Coast has become less secure than in the past (Winter 1997) and the process of obtaining and maintaining a plantation has become increasingly risky and expensive.

Plantations are managed by a senior member of the Zaradougou household who moves to live in Ivory Coast for some years, accompanied by other family members and at least one woman to do the domestic work. The relationship between plantation manager and the household head varies from household to household, and illustrates how plantations can have either a unifying or a disruptive role within households. Managing migration in Zaradougou is often a matter of balancing trade-offs between the diverse social and economic needs of the household as a unit and the individual interests of its members.

The plantations in Ivory Coast have a central role in determining the sustainability of livelihoods in Zaradougou, as can be seen from their predominance as an investment strategy over the past twenty years. Certain conditions determine whether or not the plantation will make a positive contribution to the sustainability of livelihoods, such as the degree of tenure security in Ivory Coast, the level of cohesion within the household to assure the regular remittance of capital, and secure supply of labour to run both enterprises. When some or all of these criteria are met, the plantations make a positive contribution which can ensure the household's continued viability.

Dalonguebougou

Income diversification is one of a range of possibilities for meeting the needs of the household. The principal objective of Bambara farmers is to grow as much millet as possible, and the investment of labour reflects this. Individuals and households diversify either to ensure that they are able to produce enough grain (e.g., one farmer used his migration earnings to buy a donkey cart), or to gain additional income (e.g. households have invested in mills and shops). These different types of investment form a continuum from diversification as a coping strategy to diversification as a means to accumulate wealth. The place where any household falls on that continuum is due in part to its existing wealth, but is also closely related to where that household finds itself in its demographic cycle. Thus, diversification is a dynamic strategy depending on both internal household factors, and external opportunities. Larger households containing many young men are much better able to exploit such external opportunities, by allocating labour to new activities and markets.

The pursuit of diversification activities amongst the village Bambara is highly structured. Age and gender strongly influence who pursues which activity, but access to skills, capital and markets can also be critical. Understanding the structure of the household is central to understanding the contribution made by diversification to the sustainability of livelihoods. Members of large and complex households are usually able to diversify their livelihoods more successfully than members of small, simple ones. Many diversification activities are undertaken for individual profit and are often related to preparations for marriage.

Most of the income contributed to the household from diversification activities comes in the form of migration remittances. Of those four households who did not include migration as a source of income, three did not have sufficient labour to allow a man to migrate during the dry season. The fourth has plenty of labour, but in 1997–98, no young men wanted to migrate; in this household, they are wealthy enough to have the choice.

Sale of agricultural surplus (millet, groundnuts and cowpeas) is the only source of income that all households had in common over the 1997–98 season, and it is also the largest source for nine of the fourteen households interviewed. The other households cited livestock sales or migration remittances as their most important source of income. However, data from one year is never typical, particularly where livestock sales are concerned, and for this reason caution must be exercised when trying to draw conclusions about household level diversification and sustainability with data looking at household income over a single year.

The percentage of the adult labour force with an off-farm activity is a more accurate indicator of diversity of income sources. Most of those undertaking a diversification activity do so habitually based on a skill (tailor, carpenter, weaver etc.) or an activity traditionally pertaining to one gender or age group (spinning cotton, weaving cloth, making granaries).

General conclusions that can be drawn from the discussion concerning diversification and the household economy are:

- Only the better-off households can afford the capital and labour to diversify at the household level, into such activities as shops and mills.
- In smaller households, revenue from individual diversification activities tends to be used to supplement the household budget, and constitutes a means of coping with habitual stress and poverty.

- Individual diversification in larger, complex households principally benefits the individual. In households where break-up is a serious risk, individual diversification can provide a way for sub-groups within the household to accumulate wealth and assets over time, to the detriment of the well-being of the larger household.
- Migration remittances are by far the most important type of contribution made by diversification activities to the household economy. Use of remittances depends on the timing of the remittance and the needs of the household. In better-off households, young men can usually keep a major share of their earnings, while in poor households such cash will be absorbed by tax payments, food purchases and other essentials.

Other actor groups in Dalonguebougou

The visiting Bambara farmers diversify their off-farm livelihoods much less than village Bambara. While they are in Dalonguebougou, this is due to lack of time, as well as to the distance of the hamlets from the centre of the village. For the remainder of the year, this may be due to a number of factors relating to the local economies of their villages of origin and their household structures.

Of all actor groups in the village, it is the Fulani who have the most diverse sources of regular income. All Fulani have some animals of their own, cultivate a millet field, and have at least one member who earns a salary herding the cattle of village Bambara. Activities such as the sale of milk, trading of livestock and leatherwork are also common. However, they are not much involved in diversification which involves a change of location. Their present activities supply them with sufficient income and their range allows them to offset risks.

Gender issues in diversification

Women in Zaradougou have very limited say in decisions regarding the management of farms and the use of income from the household fields. They are generally described as a labour force subject to the decisions of the men and very little informed about the various technologies applied on the farm (Degnbol 1999). So-called individual activities are their main source of revenue which, in general, they can use at their discretion. They may use this to buy clothes for their children and themselves, prepare the extensive collection of clothing and household goods, or *trousseau*, which their daughters will take on marriage and assist their own parents in times of need. Women may also use the food they produce to support their immediate family

during the 'hungry period' (*la soudure*) in the months just before the main harvest.

In Zaradougou, women's sources of income include the processing of fruits from trees, cultivation of individual fields and some wage labour. Some women have exclusive rights to the fruit of certain trees, usually locust-bean (*Parkia biglobosa*) and shea-nut (*Butyrospermum parkii*). Other women have to rely on trees which are accessible to everyone and may be more distant from the home than owned trees. The extent to which women are able to exploit these rights of access depends on the time they have available, which will vary according to the woman's age, marital status and position in the household. It will also depend on her energy, strength of character and motivation to harvest the fruit in the limited time left when all her other household obligations have been fulfilled.

Women's individual fields in Zaradougou are mostly located on rather marginal soils. Rearing of individually owned small stock and poultry is another investment strategy open to women in Zaradougou, though women need enough time to collect fodder, and capital to buy animals. Recently some women have started working on the rice harvest in the neighbouring area of Kléla. Women also migrate to the plantations in Ivory Coast, where they carry out domestic and agricultural work⁷.

In Dalonguebougou, women traditionally accumulate wealth through their individual fields, which they use to assist their daughters in the purchase of the *trousseau* necessary for marriage, and to support their sons and other kin. Several women observed that they hoped to invest in small stock when all their daughters were married because animals represent a longer-term investment. Women are estimated to own more than 80 per cent of the goats and 70 per cent of the sheep in Dalonguebougou.

⁷ Women complain of the extreme solitude and loneliness they experience on plantations, often isolated in areas that are far from villages and markets. Some women are sent to Ivory Coast against their wishes. One woman recounted being forced by her father to marry a man in Ivory Coast to stop her making a love marriage with a man from Zaradougou's neighbouring village. She is kept a virtual prisoner on the plantation, not allowed even to go to market, doing the domestic work for a household of eight men. Her only defence in this situation is to refuse to consummate her marriage. She summed up her situation: 'My father ordered me to come here with my husband. He thought that after several years in this isolated forest, my anger would calm itself. Tell my father that I am a prisoner here. However long I stay here, I will continue to sleep on my mat on the floor while my husband sleeps on his bed. You must help me.'

The harvest from individual fields depends on access to labour, household waste, manure, transport and ploughs which is closely related to the broader management of resources within the household. The use of revenue produced through the cultivation of women's individual fields is governed by an informal but nonetheless important set of rights and responsibilities to which women are expected to adhere, such as their contribution of grain to family stocks when food is scarce. The situation for men is straightforward by comparison, in that the relatively few men who cultivate individual fields tend to do so largely to meet their personal needs and generate individual wealth. By contrast, revenue from women's fields is far more likely to contribute to the continued maintenance of the household as a unit (through distribution to other household members in various forms) than to the independent wealth of a woman. Thus, women's private plots play a critically important role in those households where the supply of food is habitually insecure.

Seasonal migration is common in Dalonguebougou, with women every age group who have experienced migration. Women's migration patterns have, however, undergone significant changes in the last ten to fifteen years, with migration to urban centres to carry out domestic work now becoming frequent. The second possibility is to become a *namaden* or seasonal migrant to a neighbouring village to carry out the harvest. An important reason for this migration, is the enormous rise in cost of a *trousseau*, part of which must be met by the young woman herself. Usually the majority of the young woman's earnings will go to buy goods for her *trousseau*, comprising the collection of household goods that she will take with her when she marries.

POLICY IMPLICATIONS

In this section, key findings of this research are discussed, and their implications for policies which might better support more sustainable livelihoods in both Zaradougou and Dalonguebougou. The presence of government affects households and livelihoods in Zaradougou and Dalonguebougou through the imposition of taxes, requirement for identity cards, proposals for change to the land tenure system and initiation of the decentralisation process. Governments also draw up policies for agriculture and the broader economy, and provide basic services. The effect of government measures on farmers in Zaradougou has been mainly felt through their involvement in cotton production. Policies which have affected livelihoods in Dalonguebougou include devaluation of the CFA franc, and liberalisation of the cereal trade. The Malian government is set to continue

with liberalisation of the economy, placing heavy emphasis on the need for the state to limit itself to provision of basic services, while leaving questions of production and distribution to the private sector.

Role of local institutions

The research has demonstrated the great importance of a range of institutions through which people gain access to the resources they need to assure a reasonable livelihood. Many of these institutions are informal structures linked to kinship and neighbourhood. The large extended household, typical of Bambara and Sénoufo culture, is the central institution through which people gain security, pool resources and share risk. When managed well, it provides a remarkable framework within which people can negotiate a degree of independence and possibilities for accumulating their own assets. However, such management requires a judicious balancing of private versus group rights and duties. The frequency with which households break up suggests that it is not everyone who can master these tensions.

Apart from the household, a number of other social institutions are of great value in helping rural people survive in marginal and risk-prone conditions. These include the marriage system through which links of reciprocity and support are created and strengthened. The various age groups and *tons* found in both Zaradougou and Dalonguebougou continue to carry out occasional tasks and generate funds for communal investments. While it is easy to demonstrate the vitally important role played by these informal institutions, it is more difficult to identify how policy might be designed to support them more effectively. The Malian government, in the years following Independence, attempted to adapt such groups for a range of tasks, such as keeping the tracks clear between neighbouring villages. Villagers considered such efforts by the government as a means of trying to exploit village labour for the state's benefit rather than demonstrating an innate respect for and commitment to village institutions.

Customary institutions for managing access to natural resources

The two village studies show the importance of customary institutions for managing day to day access to farmland, water and grazing. In terms of formal law, all Malian citizens have the right to settle and farm wherever they want. In fact, strong vestiges of customary practice prevail, with village councils and traditional land chiefs maintaining control over who can farm, water or graze their animals. The new draft land tenure legislation, currently being debated (*Code domanial et foncier*) recognises this *de facto* management

by customary structures, and the need for incomers to negotiate and live in peace with their neighbours. However, it should be acknowledged that customary institutions may not necessarily lead to equitable outcomes, in terms of improving the position of women, or guaranteeing access to land for marginal groups. With decentralisation, such customary structures may find their role increasingly contested, as noted below.

Decentralisation

Within the ongoing process of decentralisation taking place in Mali, Zaradougou and Dalonguebougou are likely to experience rather different outcomes. Although customary institutions for managing resource access are strong in both places, in Zaradougou there are also more formal structures which have emerged in response to, and been shaped by, external interventions. Thus, the *Zaradougou Association Villageoise* is the principal local institution which mediates access to agricultural inputs, extension, credit and regional affairs, while the older institutions of customary resource tenure continue to mediate *de facto* access to land and social capital. In Dalonguebougou, there is a proliferation of customary institutions and social networks through which access to resources is negotiated, but these informal structures at village level remain at a distance from the wider political context of decentralisation and tenure reform.

There are two possible outcomes of the decentralisation process: either a 'deconcentration' of power from the centre, to lower level structures which retain features of the old State system, or a genuine process of profound change and power-sharing (Coulibaly 1994) which increases the level of control local people have over their own livelihoods. The outcome of decentralisation is likely to be uneven, with change being greatest in areas where existing village level institutions have already had some experience of and training in financial management, literacy and formal inter-village relationships. In this sense it is the CMDT area with its long-standing Village Associations which stands the greatest chance of undergoing an effective transition to decentralised government (Chenevix-Trench *et al.* 1997; Degnbol 1996; van Campen 1991). The village is not, however, the key unit recognised by the decentralisation process, so the level of involvement by villagers in decentralisation will depend in part on whether the new *communes* will be willing to share power with lower level structures. The establishment of the *communes* has also generated an additional set of actors with a part to play in the allocation of rights to settle and make use of land. The stage is set for possible conflict as the new *communes* test out their strength, and the extent to

which they can assert their authority over village councils, and customary structures.

Decentralisation offers great opportunities for substantially improving the degree of local control and accountability, which it is hoped will to better management of resources. But the risk is that more powerful groups will monopolise the process to their own advantage. Policies and interventions are needed to provide rural people with greater information regarding their rights and duties, and to train them in the skills needed to exercise such responsibilities. The outcome of decentralisation and its impact on local natural resource management practices therefore present a series of unanswered questions regarding the future of rural development in Mali.

Dependence on external interventions

The important role of cotton and the CMDT means that livelihoods in Zaradougou are more sensitive to macro-level policy issues than livelihoods in other parts of the country which do not produce such a cash crop. The sustainability of livelihoods in Zaradougou relies heavily on production of cotton, a key component of the Malian economy, and on income from plantations in Ivory Coast. Villagers in Zaradougou therefore depend to a significant degree on external actors and structures to assure sustainable livelihood outcomes, but those external actors are often working to a very different agenda from villagers.

Livelihoods in the cotton zone thus are highly sensitive to changes in policy. The impacts of macro-economic reform are clearly felt by Zaradougou farmers, who consequently adjust their farming practices to a new technology or input price. Access to markets for inputs, outputs and credit, is a key feature of sustainable livelihoods, and the role of the CMDT is very important to the villagers of Zaradougou. Recently, in the context of its Highly Indebted Poor Country programme of debt reduction, the World Bank has pushed for the privatisation of cotton companies in Chad and Ivory Coast. The Bank has levelled a series of criticisms at the CMDT, ranging from the politics involved in setting the cotton price, to the relatively low share of profits enjoyed by farmers (Massou 1998). The possibility of privatising input supplies for cotton production has also been much discussed in Mali. Proponents of liberalisation argue that farmers would benefit from lower input prices, while their opponents emphasise the likely increased uncertainty in the availability, quality and timeliness of such supplies. SYCOV tried a few years ago to set up their own fertiliser supply system but were unable to obtain timely

deliveries of fertiliser while quality was also not guaranteed. SYCOV's experience, however, strengthened their position in discussions with the CMDT on price setting for inputs. The government and the CMDT have been able to resist pressure in favour of privatisation for the time being. However, there are continuing concerns about losses, theft and other forms of fraud within the CMDT, so that reorganisation of the CMDT's operation is likely to remain on the agenda of donors, government and SYCOV.

Migration

The Ivory Coast plantations are the main form of diversification for households in Zaradougou. These are also threatened by changes beyond the control of farmers. Free movement of people within West Africa has been critically important for ensuring the livelihoods of farming communities in Mali and other Sahelian countries. Very large numbers of people have moved south from the Sahel to coastal states such that, for countries like Ivory Coast, one third of the population is now made up of people who were not born there. Commentators view migration from rural areas as something negative, which should be stopped, if possible, by providing more profitable opportunities closer to home. But this is to misunderstand the important role played by migration, particularly for young men and women for whom this constitutes a rite of passage and a source of valued experience, as well as providing much needed income. Migrants who do well gain sums greatly in excess of what can be earned at home, and are of value for all households in Zaradougou and Dalonguebougou, both rich and poor.

To ensure continued benefits from migration opportunities in neighbouring countries, attention needs to be paid to the changing status of migrants in countries such as Ivory Coast. After several decades of great openness towards migrants, the political attitude in Ivory Coast has hardened considerably. Maintaining access to the opportunities presented by the Ivory Coast economy is very important for the Malian economy, particularly for farmers like those of Zaradougou who have invested considerable amounts of capital in plantations. Equally, Sahelian labour and plantations are a major source of coffee and cocoa production for the Ivory Coast economy. Thus, both the Ivorian and Sahelian states have an interest in providing greater security over access to land for migrants in Ivory Coast.

Research and extension

Cotton became Mali's most important export crop during the period of French colonialism, and since that time has been a major focus of investment for both

government and donors. At present, farmers in southern Mali benefit from a relatively well developed system of research, extension, input supply and marketing support. The rainfed cereal areas, by contrast, receive far less attention from government services and donors, so that these farmers have much less access to research and extension support, inputs and infrastructure.

Agricultural intensification through a mixed farm model has been clearly identified by the CMDT and government research as a strategy to maintain cash crop productivity, whilst increasing the sustainability of agriculture and thus, by implication, of the livelihoods of those who depend on agriculture. This policy has certainly increased the potential for some households to increase cotton production, though this has often involved an expansion of area cultivated, rather than a greater level of intensification. If current policy is examined from a livelihoods perspective, however, several inconsistencies emerge. The two villages of Zaradougou and Dalonguebougou exhibit markedly different access to and familiarity with research and extension activities. As part of the CMDT zone, Zaradougou has benefited from the various packages developed to promote cotton production. At the same time for many households in Zaradougou, cotton production is only one amongst a number of income-generating opportunities. The plantations established by many households in Ivory Coast provide a major share of income and source of funds which are then re-invested in cotton production. Equally, many farmers in Zaradougou have successfully diversified their agricultural production to include fruit and vegetables, reflecting a common strategy of many farmers in the cotton zone more generally. These crops are not handled by any state marketing organisation and hence farmers can gain considerable returns when the prices are right. The CMDT is increasingly taking an interest in diversification activities⁸ but seldom addresses the significant flows of capital between cotton cultivation and off-farm activities, and the extent to which the latter support the former.

Farmers in Dalonguebougou have had little or no contact with the extension services, since the village lies a considerable distance from any major town and is outside the main cash crop producing areas covered by the CMDT and *Office du Niger*. Yet farmers have made considerable changes to their cropping practices in the last thirty years, taking up new varieties, adopting oxen drawn ploughs, expanding greatly the size of their fields, and intercropping with various minor crops. Such changes have come about as a result of farmers travelling elsewhere, seeing new equipment at work, trying

⁸ This is at present principally in drier areas than Zaradougou, where cotton has become less viable for all households, not just poorer ones.

out new seed gained from a relative or visit to market, and experimenting with new ways to do things. The development of highly productive manured land, based on investment in household wells, is a good example of this capacity to innovate. The experience of Dalonguebougou shows the potential dynamism of farmers and their adaptability, even where there are no formal extension services providing support. Thought could usefully be given to ways of strengthening this capacity at village level to learn, experiment, and share lessons from new methods.

A broader understanding is needed of the diversity in assets and strategies amongst rural households, and the varying role played by agriculture within their livelihood systems. Agricultural research in both the cotton zone and rainfed areas is based on a classification which characterises households in terms of their agricultural assets and expertise, which limits an understanding of the constraints on livelihoods in a broader sense. Research and extension activities to support more sustainable rural livelihoods need to focus not only on improving crop productivity, but also identifying ways to help poorer households diversify into non-agricultural activities. A considerable amount of labour is required to run a cotton or millet farm, using animal traction, and assuring timely operations on the various fields being cropped. It may make more sense for small, poor households either to share livestock and equipment and hire it in when needed, or to concentrate on non-farm work. Various efforts have been made to address the needs of poorer households within the CMDT zone, such as making loans available for purchase of equipment by farmers just setting up. This facility, now withdrawn, provided a means by which asset-poor households could gain an oxen plough team of their own. Other ways of providing credit and technical support for the development of non-agricultural incomes for poorer households could usefully be considered.

Poverty

In 1998, Mali drew up a *National Strategy for Combating Poverty* (Government of Mali, 1998). This identifies people's perceptions of poverty and the characteristics which typify impoverished groups. The data for 1996 show more people below the poverty line⁹ than in 1989, while the incidence of poverty was found to be higher in rural than in urban areas. In terms of the characteristics of poor households, the survey showed that poorer households

⁹ The poverty index used is the income required to allow for daily subsistence of 2,450 calories/day (Government of Mali 1998). This comes to an estimated poverty threshold of 103,000 CFA francs per person per year for 1996 with an extremely poor threshold at 51,000 CFA francs per person.

tend to be larger, with an elderly household head who has received little or no education. Such broad characteristics to identify poorer versus richer households may capture at a national level the main differences between urban and rural areas. However, within rural communities, the characterisation of poor households is somewhat different. In both Zaradougou and Dalonguebougou, the poorest households tend to be those of very small size, with insufficient labour to diversify effectively, or larger, complex households with serious management difficulties. In these rural areas, the large extended household continues to constitute the most important institution for the mobilisation of labour and capital, the establishment and maintenance of social relations and some degree of protection against risk.

CONCLUSIONS ON LIVELIHOOD SUSTAINABILITY IN MALI

The research outlined above chose two contrasting sites within which to investigate the options, strategies, and outcomes by which people try to ensure the sustainability of their household and enterprise in rural Mali. The sites represented locations with substantial differences regarding their historical evolution, agro-climatic characteristics, economic opportunities, and institutional development. Consequently, the detailed strategies pursued and outcomes achieved by households in the two study sites are, inevitably, substantially different. Thus, for example, in Dalonguebougou, farmers have never been part of a development programme and have relied on their own ingenuity, experimentation with new ideas, and their own financial resources, such as migration earnings, to invest in new equipment. Households in Zaradougou by contrast have been part of the CMDT cotton growing system for several decades, with many attendant consequences for access to technology, credit, inputs and markets. The greater incomes which can be achieved by Zaradougou farmers in this area of higher potential are gained, however, through greater market integration, with its attendant risks, as well as benefits.

Despite the differences between the case study sites, there are also clear similarities which demonstrate the commonality of response by households in Mali to risk-prone farming and livelihood conditions. In both cases, the household has remained a fundamental institution within which people organise their lives and try to ensure themselves a sustainable future. The large domestic groups typical of Bambara and Sénoufo culture offer significant advantages in terms of being able to mobilise labour, financial and social capital to exploit an array of activities. These range from, on the one hand,

cultivating a field, care of draft oxen, and maintenance of a well to, on the other, gaining cash from dry season migration, investing in a shop, and developing a cocoa plantation in Ivory Coast. Given the very weak development of labour markets, farmers depend very largely on household members to supply the labour effort needed. Small households are much less able to manage such a demanding array of tasks and, as a consequence, tend to be economically much less viable. Heavy reliance on family labour helps explain the care taken to try and ensure that large households stay together and avoid the grave costs of fragmentation.

The sustainable livelihoods approach has been valuable in focusing attention on several key processes. An *analysis of institutions* allows for a better understanding of how access to different resources is achieved and how rules are renegotiated as circumstances change. Study of institutions also encourages a focus on whether access to certain resources is systematically biased against certain groups, and the extent to which policy interventions can correct such biases. The strategies open to different actors depend not only on household size and their ownership of various assets, but also on the origins and rights of different groups and the institutions through which such rights can be expressed. Rights are determined partly by ethnicity but also by factors, such as length of settlement, and the ability to establish a preferential arrangement with those holding primary rights. The village of Dalonguebougou with its extensive lands has been the target for many incomers seeking water and grazing for animals during the dry season and, more recently, for farmers needing access to land for cultivation. Here, although the settled Bambara continue to maintain their authority over who can gain access to land and water within their territory, these rights are increasingly contested. Arguments concerning who may have the right to dig a well are particularly heated. In the case of Zaradougou, there has been relatively little migration into the village territory in recent years, whether for cultivation or for grazing. Nevertheless, institutional changes in neighbouring Ivory Coast are of great importance to farmers in Zaradougou, since the growing competition for land and process of land registration taking place may jeopardise the profitability and security of their plantations.

The research shows the importance of *scale issues* in considering the 'action space' open to Sahelian populations (Painter & Sumberg 1992). Economic activities pursued by villagers of Zaradougou and Dalonguebougou are by no means limited to the *terroir* surrounding the settlement. Zaradougou provides an extreme but not untypical case, in which major investment of capital has been made more than 1,000 km away. The example of Dalonguebougou is less

extreme, although young men often travel down to the coast for several months of the dry season, and migrant farmers from 30–50 km away spend the cropping season around the village. Equally, there are extensive grain trading links both south to Bamako and Ségou, and north to Mauritania. Institutional change, with the establishment of the new *Communes Rurales* will introduce a new scale at which decisions are made and resource management exercised.

An historical approach to understanding the *dynamics of livelihoods* is essential, since the current position faced by a particular household is the end result of earlier processes, and their interactions. The better-off are usually those for whom a favourable combination of external and internal factors has evolved which enabled them to take advantage of emerging opportunities because they had spare labour, or capital to invest. Thus, for example, those Bambara households in Dalonguebougou which are currently wealthy and large were those who took advantage of the 1950s groundnut boom which funded purchase of ploughs and oxen, and the well-digging of the 1980s which enabled the growth of cattle herds. At present, the better-off households are investing in profitable trading activities, with several shops now selling a wide range of goods. By contrast, households which are currently poor frequently have suffered a misfortune, such as untimely death, or household break up, which further diminishes their capacity to invest in farm assets and diversify into profitable activities. Policy choices aimed at addressing the needs of poorer households need to identify mechanisms by which small, vulnerable households can start to establish a base of assets and activities that enable them to become more economically viable. Given the difficulties of maintaining the many assets required for a successful farming enterprise, attention should focus on ways to support a range of diversification activities both within and outside the farming sector. Easier access to credit to help develop a range of diversification opportunities would provide a valuable way forward for poorer households in both the villages studied.

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