Small is beautiful?

The impacts of small-scale bio fuel production on people's access to land in the Koulikoro Region, Mali

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List of Abbreviations

ANADEB	L'Agence Nationale de Développement des Biocarburants
CELP	United Nations Commission on Legal Empowerment of the Poor
CMDT	Compagnie Malienne du Développement des Textiles
FACT foundation	Fuels from Agriculture in Communal Technology foundation
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
IER	l'Institut d'Economie Rurale
KIT	Royal Tropical Institute (Koninklijk Instituut voor de Tropen)
MBSA	Mali Biocarburant Société Anonyme
OPEC	Organisation of the Petroleum Exporting Countries
PNVEP	Programme National de Valorisation Energétique de la Plante Pourghère
PSOM	Programme for Cooperation Emerging Markets (Programma Samenwerking Opkomende Markten)
ULSPP	Union Locale des Sociétés Coopératives des Producteurs de Pourghère

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Executive summary

Bio fuels are considered as an important possibility to help solve or mitigate global problems. The use of bio fuels can potentially decrease Greenhouse gas (GHG) emissions in transport and can also reduce the dependency on oil. In addition, bio fuel production can revitalise the rural sector in developing countries, which is expected to benefit both local and national development.

The Mali Biocarburant company produces bio fuels from Jatropha in Mali. Jatropha is a tree that grows non-edible nuts that contain oil. Because the nuts and oil are not edible, the production of Jatropha does not directly compete with food production. Furthermore, Mali Biocarburant tries to improve local people's livelihoods by introducing small-scale Jatropha production in villages, where villagers are informed how to best intercrop Jatropha with food production on their lands.

The objective of this study is to answer the question: *Does small-scale Jatropha production result in changes in the differentiated access to land and which institutional factors account for this?*

The hypothesis is that Jatropha commercialisation for bio fuel production will generate an increase in land value and will trigger a demand for land. If this occurs, it is expected that people's access to land will change and that local institutional factors (e.g. 'indigenousness', 'gender' and 'seniority') and national institutional factors (e.g. the Land Laws of 1986 and 2000, which provide Malians the opportunity of obtaining individual land titles) might account for this change.

It is expected that a change in people's access to land will be in favour of the powerful groups (i.e. the founding families, men and older community members), and at the expense of the vulnerable groups (i.e. the later families, women and younger community members). Furthermore, such a change in access to land may also come about if an increased demand for land occurs under conditions of high land pressure. It is namely hypothesised that land pressure, in combination with the local institutional factors, will influence people's access to land.

This exploratory research was carried out for Mali Biocarburant in six villages in the Koulikoro Region.

This study has shown that there are important differences in land pressure between the six villages. There is no land pressure in the village of Dontieribougou, but there is high land pressure in the villages of N'Piébougou and Ferekoroba. Also, access to land for later families' and women is most unequal in the village of Ferekoroba.

Furthermore, this research has shown that people's access to land is mostly determined by the local institutional factor of 'indigenousness' and followed by the 'gender' and 'seniority' factors. The research has concluded the following for each of the local institutional factors and Jatropha production.

The 'indigenousness' principle distinguishes the families that settled later in a village (termed 'later families') from the descendents of the village's first settlers (termed 'founding families'). Later families are allocated less land than founding families and they produce Jatropha on fewer hectares. In Feya and Ferekoroba, there are five later families that cannot start or extend Jatropha production. Although there is still unused arable village land available in Feya, the later families cannot obtain more land for Jatropha production from the village chief because they settled later. In Ferekoroba, later families are not given more land because of high land pressure.

The ‘gender’ principle distinguishes women’s inferior access to land from men. Mostly men are involved in Jatropha production because they have better access to land and materials and because women have many different daily tasks and need their husbands’ permission to grow Jatropha. However, there are differences among the villages. In four villages, women are allowed to produce Jatropha but in M’Pana and Ferekoroba women are excluded from individual Jatropha production.

The ‘seniority’ principle is about the superior position of older community members in relation to younger community members. The principle is mostly important for men’s access to land and not so much for women. All male family members need to ask the family chief’s approval to grow Jatropha. The younger, unmarried men are not given but lent land and they help the older male family members. As soon as men marry, they are given more land on which they can start Jatropha production (after the family chief’s approval).

National institutional factors that may change people’s access to land are the Land Laws of 1986 and 2000. These laws provide Malians with the opportunity of obtaining individual land titles. This study discusses the suggestions on how to better harmonise the formal and customary land tenure systems, and what changes are needed with regard to the Land Laws. Furthermore, discussions on the desired scale level of bio fuel production (small scale or large scale) may also change people’s access to land. This is because ANADEB (the national agency for the development of bio fuels) will formulate rules and regulations for bio fuel production in Mali.

This study concludes that small-scale Jatropha production has not changed people’s access to land. There are no indications that the introduction or extension of small-scale Jatropha production has worsened the unequal access to land of vulnerable groups, or has led their losing access to land. The study does conclude that there is unequal access to land for founding families and later families, men and women, and older and younger members of the community, and that powerful groups are more involved in Jatropha production than vulnerable groups.

Another objective of this study has been to formulate recommendations on small-scale Jatropha production for bio fuels. The recommendations aim for inclusive rural development, which implies the prevention of increased unequal access to and/or exclusion from land as a result of Jatropha production.

Firstly, it is recommended that Mali Biocarburant considers land pressure in the villages where it is to introduce small-scale Jatropha production. This production in villages with high land pressure might increase the unequal access to land or might lead to an exclusion from access to land of vulnerable groups.

Secondly, delineating family fields with Jatropha is a good way of securing a family’s access to land. Planting trees (e.g. Jatropha) is considered as claiming (informal) land ownership. By planting Jatropha in the presence of the owners/users of the neighbouring fields, conflicts between families can be prevented and delineation can be legitimised.

Women’s unequal access to land and limitations on producing Jatropha could be improved by explaining the importance of women’s participation in Jatropha production for the village’s and/or family’s welfare. Furthermore, they could be provided materials through a micro credit system, for example.

The government should focus on overcoming problems with obtaining individual land titles. Furthermore, the government should consider later families as a group that deserves more attention and possibly set up policies to better regulate their access to land.

Part 1

Setting the scene

1 Introduction

1.1 Bio fuels as energy source

The past few years have shown that there is an increased global interest in the production and use of bio fuels. Bio fuels are a renewable energy source because they are produced from plant material that "can be processed into liquid fuels for transport, electricity or heating purposes" (Meeusen et al, 2008, p.6). The increased interest in bio fuels stems from their possibility to help solve or mitigate three global problems.

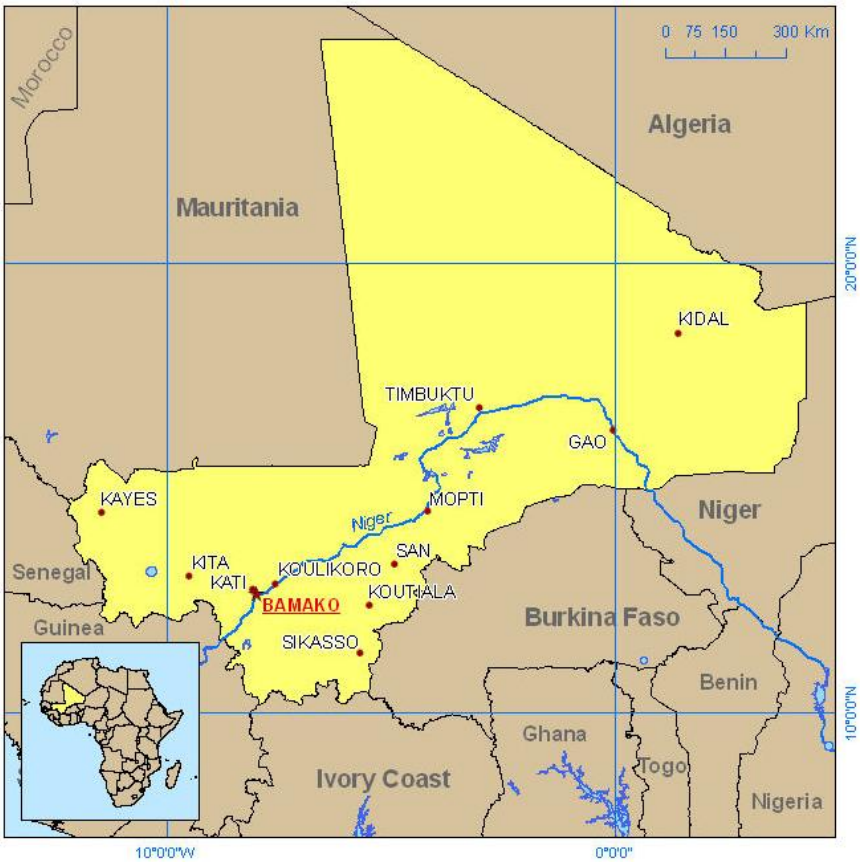
Firstly, bio fuels have the potential to reduce greenhouse gas (GHG) emissions. According to the International Panel on Climate Change (IPCC), GHG emissions are very likely an anthropogenic cause for climate change (IPCC, 2007). In petrol engines, fuel is combusted and emits GHG. However, by developing and applying mitigation technologies, GHG emissions can be reduced or prevented. During the life span of a bio fuel crop, the plant absorbs carbon, which makes it a carbon-neutral energy source when it is used as a fuel source for transportation.

Secondly, oil is a depletable energy source for which demand has increased during the past years and is still increasing in both the developed and emerging markets, especially China and India. This increasing demand, together with various political issues, has resulted in volatile oil prices in recent years. Consequently, several countries and political regions have decided to become more involved in policy making on bio fuel production and consumption, with the intention of reducing their dependence on the Organisation of the Petroleum Exporting Countries (OPEC) and securing their access to energy. For example, Brazil has been involved in ethanol production from sugar cane since 1970 (Meeusen et al, 2008) and, more recently, the EU published the Renewable Fuels Directive, which states that in 2010, 5.75% and in 2020, 10% of the transport fuels should come from renewable fuels (Official Journal of the European Union, 2003). The increased demand for bio fuels and such bio fuel policies have led to large-scale bio fuel plantations in countries such as Brazil, Malaysia and Indonesia. This resulted in the logging of huge areas of tropical rainforests, human rights violations and the expulsion of indigenous communities from their lands without any compensation (Patzek & Patzek, 2007). These trends are of great concern for the inhabitants of those regions, environmental NGOs and governments. The awareness of the consequences of large-scale bio fuel production has led to the initiation of the formulation of sustainability criteria for bio fuel production in, amongst others, the Netherlands and the European Union.

Thirdly, the interest in bio fuels also manifests itself in developing countries, where the production of bio fuels is sometimes considered as a possible force for the revitalisation of the rural sector (The Renewable Fuels Agency, 2008; The Royal Society, 2008; United Nations Department of Economic and Social Affairs, 2007). Furthermore, nationally produced bio fuels could (partly) replace costly imported petrol and improve a nation's access to energy, which is another reason for developing countries to interest themselves in bio fuel production. One of these countries is the Republic of Mali, a developing country in Western Africa.

1.2 Bio fuel production in Mali

Mali is a land-locked country with an arid to semi-arid climate; 60% of the country's surface is in the Sahara desert. In general, the Malian population lacks (good quality) access to electricity; only 10% of the total population has access to electricity, and only 1% of the rural population has access (Maiga et al, 2006). Since 90% of the population lives in rural areas, the largest share of the Malian population does not have access to electricity. For the people living in the rural areas, biomass sources, such as fuel wood, charcoal and agricultural residues are important energy sources. An increased access to energy is important for people living in rural areas because "[i]t can contribute to social development by helping to fulfil the basic human needs of nutrition, warmth and lighting – all prerequisites for improvements in areas such as education and public health" (Ha & Porcaro, 2005, p.194).



Map 1: Mali (Source: European Commission)

Because there is no oil production in Mali, the complete national petrol consumption, an amount of around 5,600 barrels per day (Kimble et al, 2008), is imported. Since 2004, the government of Mali has explored the possibilities of bio fuel production and is involved in developing a national strategy for bio fuel production from Jatropha. This strategy is called *Programme National de Valorisation Energétique de la Plante Pourghère* (PNVEP) and aims at improving rural development and tackling the problem of a lack of access to energy with the cultivation of Jatropha. It has the following objectives:

- To substitute gasoline with Jatropha bio fuel and use it for transportation and rural electrification.
- To use the by-products of Jatropha for the production of cosmetics and soap, and use the press cake as a fertiliser for the soil.
- To promote the position of women in rural areas and to stimulate sustainable development without deteriorating the environment (translated from: Biocarburant – Afrique, 2006).

Jatropha Curcas L. is a small drought-resistant tree or a large shrub that originally comes from tropical America. The shrub grows nuts that contain oil, but these are toxic and therefore not edible (Jongschaap et al, 2007). From the third year of Jatropha production onwards, the nuts can be harvested (Van Eijck & Romijn, 2007). After pressing, the oil can be used as a bio fuel. Because

Jatropha is not edible, its cultivation does not directly compete with food consumption, which is the case with crops like maize and sugar that are also used as bio fuel sources. Since the 1970s, the Royal Tropical Institute (KIT) has planted Jatropha in Mali to control erosion and to protect the plots of lands of local farmers from grazing animals by using it as a living, poisonous fence (KIT, 2007).

Many projects, organisations and companies have set up bio fuel production from Jatropha in Mali, and some of them have been involved in this since the end of the 1980s. For example, the German GTZ (Deutsche Gesellschaft für Technische Zusammenarbeit), Mali Folkecentre Nyetaa, Multifunctional Platform, FACT foundation, ACCESS S.A.R.L., AMADER (l'Agence Malienne pour le Développement de l'Energie domestique et de l'Electrification Rurale) and Mali Biocarburant. These organisations all aim to improve people's access to energy and to improve their livelihood strategies and thus to stimulate rural development.

Picture 1 Jatropha plant with nuts

1.3 Mali Biocarburant

Mali Biocarburant S.A. is a company that has been involved in small-scale Jatropha production for bio fuels in Mali since 2007. Its administrative office is located in Bamako, and the factory is situated in Koulikoro, a city 60 kilometres north east of the capital city Bamako.

The bio fuel company is partly financed by the Programme for Cooperation Emerging Markets (PSOM), which derives its budget from the Dutch Ministry of Development Cooperation. Other financers are shareholders, such as the Dutch Royal Tropical Institute (KIT), the private company Power Pack Plus and the pension fund of the Dutch Railway company 'De Nederlandse Spoorwegen'. There are also two local partners in Mali; these are Interargo and the farmers' association 'Union Locale des Sociétés Coopératives des Producteurs de Pourghère' (ULSPP), which is based in Koulikoro (Mali Biocarburant, 2009).

Mali Biocarburant has small-scale Jatropha plantations in three production zones. In 2007, the bio fuel company started the introduction of Jatropha production in the Koulikoro Cercle in the Koulikoro Region. In 2009, this was extended to the Ouelessebougou commune in the Koulikoro Region (see map 2) and in villages around Kita (see map 1), a Commune in the Kayes region.

In the three production zones, Mali Biocarburant employs a total of 27, mostly male, field employees[1]. Each field employee works in about five villages, where he or she informs the villagers about the possibility of intercropping Jatropha with their food and/or cash crops[2]. Mali Biocarburant introduces intercropping as a production method because small-scale Jatropha farmers' lifes are characterised by subsistence farming. Intercropping prevents competition between food and bio fuel

[1] There are 12 field employees in the producer zone of Koulikoro, 5 in Ouelessebougou and 10 in Kita.

[2] Cash crops are crops that are grown to be sold (e.g. cotton), which, in the context of rural Mali, can be an important source of income.

production. Jatropha is planted by the villagers on the land they obtained through their local customary traditions (this is explained in section 2.3).

The field employees guide the villagers with the three phases of Jatropha production. In the first phase, Jatropha seeds are planted in a nursery so that they can grow into viable Jatropha plants. On the basis of a socio-economic baseline study performed by Timothy Singer, a former intern at Mali Biocarburant, nurseries were set up under the name 'école de pourghère' (Jatropha school) at the beginning of 2009. Because it is vital to water the seeds and the young Jatropha plants, the nursery systems are located in fields where there is easy access to a well. Up to about 25 people per village are guided by a field employee in setting up a nursery. For each hectare of Jatropha production, seeds are planted in a 10 metre long row with a width of 1 metre (see picture 2). During the months of May and June, villagers visit the nurseries twice a day to water the plants (see picture 3).

Picture 2 Jatropha school

Picture 3 Watering the Jatropha plants

In July and August, when it is rainy season, the young Jatropha plants are long and strong enough (see picture 4) for transplantation from the nursery to the fields. Depending on how village and family lands are organised, Jatropha is planted in communal, family and individual fields. To intercrop Jatropha with food and other cash crops, Jatropha is planted in rows that are five metres apart. The Jatropha plants are placed in the rows with two metres space between them; which allows them to become large shrubs and grow as a hedge (see picture 5).

The third production phase is the harvest season during September, October and November. Plantations of three years and older start producing oil-containing nuts and after a three year period, the first Jatropha nuts can be harvested. Throughout the whole year, small-scale plantations are maintained, parasites are repressed and the Jatropha trees are cut.

Before Mali Biocarburant introduced small-scale Jatropha plantations for bio fuel production, Jatropha was planted to prevent erosion and protect food production from grazing animals. Furthermore, women used the Jatropha nuts for soap production. Nowadays, Jatropha continues to

fulfil these functions but can also be considered as a cash crop because the bio fuel company pays Jatropha farmers for their Jatropha harvest.

Mali Biocarburant wonders whether the introduction of Jatropha production for bio fuels impacts vulnerable groups' access to land now that it has become a cash crop and powerful groups might want to take over the business (Verkuijl, 2009, personal communication). This process might occur because land management in Mali at a local level is governed by local institutions, and favour certain groups.

Picture 5 Small-scale Jatropha production

Picture 4 Villager with his Jatropha nursery
at the end of July

1.4 Research objectives and relevance

The objectives of this research are:

- To explore whether Jatropha production for bio fuels results in changes in access to land and, if so, for whom.
- To formulate recommendations in the context of small-scale Jatropha production that aim to prevent both possible exclusion from land access and the worsening of unequal access to land.

The first research objective tries to tackle the lack of knowledge about the impacts of small-scale Jatropha production on access to land. In the light of the aims of the *Programme National de Valorisation Energétique de la Plante Pourghère*, this objective is important since there is an assumed potential for 'rural development' as a result of small-scale Jatropha production for bio fuels. The second research objective focuses on how, in the context of small-scale Jatropha production, access to land can be better secured for vulnerable population groups. It is valuable to consider this because improvements could realise the potential of rural development.

These objectives were translated into the following central research question:
Does small-scale Jatropha production result in changes in the differentiated access to land and which institutional factors account for this?

To answer the central research question, the following steps were undertaken (see also figure 1, Research framework). The research consists of a theoretical and an empirical phase. During the theoretical phase, literature review focused on two themes, namely institutional factors that arrange land tenure and the possible impacts of cash crops on access to land. The information retrieved from this phase resulted in a conceptual model. The conceptual model is an abstract representation of the accumulated information, and gives direction to the empirical research.

The empirical phase consisted of two parts. The first, and largest, part consisted of the study of the local situation, where small-scale Jatropha production takes place and local institutional factors determine people's access to land. The second part focused on the national context, where different national institutional factors might account for changes in access to land. On the basis of the results, conclusions were drawn and recommendations formulated.

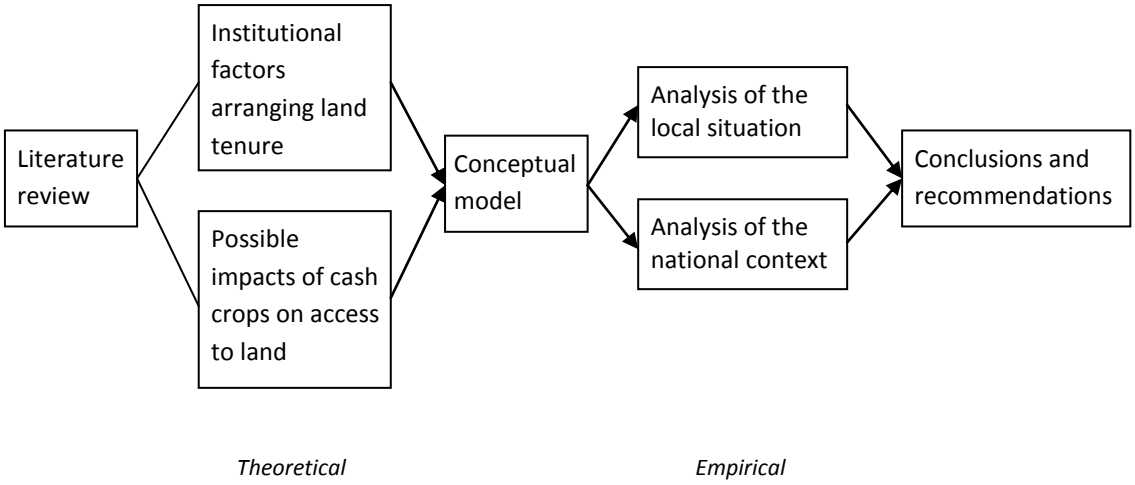


Figure 1 Research framework

With the aim of answering this central research question, the following five research questions were formulated:

1. According to the literature, which institutional factors account for access to land and which impacts on access to land are expected from the introduction of cash crops and bio fuel production?
2. How is access to land traditionally arranged among founding families and families that settled later, men and women, and older and younger members of the community?
3. Does the introduction and extension of Jatropha production for bio fuels change the access to land for (these specific) population groups?
4. Which national institutional factors might account for changes in access to land?
5. Which recommendations concerning small-scale Jatropha production for bio fuels can be formulated to prevent both the exclusion of vulnerable groups from their access to land and the worsening of inequalities in land access?

1.5 Structure of the report

The report is divided in three Parts and is structured as follows. Part I *Setting the Scene* continues with chapter 2, which reviews literature and answers the first research question.

Part II *Methodology, results and* analysis, consists of chapter 3, 4 and 5. Chapter 3 presents the resulting conceptual model from the literature review. The conceptual model visualises the most important elements of the literature review and the hypotheses underlying this research. Chapters 4 and 5 analyse the empirical results retrieved from the field work. Chapter 4 treats research questions 2 and 3, and chapter 5 treats the fourth research question.

Part III *Discussion, Conclusions and Recmomendations* concludes the report, and includes chapter 6 with three similarly named sections. Section 6.3 focuses on research question 5 and presents the recommendations that are formulated on the basis of the analysis in chapters 4 and 5.

2 Literature review

2.1 Introduction

This chapter serves to answer the first research question:

According to the literature, which institutional factors account for access to land and which impacts on access to land are expected from the introduction of cash crops and bio fuel production?

Sections 2.2 and 2.3 focus on the institutional factors that account for access to land. Section 2.2 defines 'land tenure arrangements' and demonstrates that there is disagreement in academic literature about how land tenure should be arranged in developing countries, where formal property laws are often not introduced or do not fit well with the existing informal land tenure arrangements. Section 2.3 explains the different land tenure arrangements in Mali. Formal Land Laws have been introduced, but people living in rural Mali live according to the customary land tenure arrangements. Section 2.4 discusses how cash crop production might affect people's access to land, especially in Mali and for societies living according to customary land tenure arrangements. Lastly, section 2.5 states which elements of the literature review are used in the conceptual model.

2.2 The discussion about land tenure

This section defines the concept of 'land tenure arrangements' or 'land tenure systems' and goes deeper into the existing views on how to deal with land tenure arrangements in developing countries. The discussion of these views is relevant because developing countries have their own specific problems regarding land tenure systems, which are sometimes a direct or an indirect result from a former colonial system, but which are sometimes also boosted by social, economic and/or environmental developments.

The concept of 'land tenure arrangement' (or 'land tenure systems') can be defined "as sets of rules – at some times customs, at others laws – concerning peoples rights to land, together with the institutions that administer these rights and the resultant ways in which people hold the land" (Hesseling, 1998, p.100).

Land tenure arrangements and natural resource management in developing countries are much-debated topics. In academic literature, two opposing viewpoints regarding land tenure arrangements can be discerned, namely the legal theory and the socio-legal viewpoints. On the one hand, the legal perspective believes that private property needs to be promoted because private property provides farmers the incentive to invest in their land which is believed to stimulate economic development (De Soto, 2000; Hesseling, 1998). This viewpoint, which is amongst others advanced by Hernando de Soto (2000), acknowledges that a lack of legitimacy for formal property laws at a local level leads to the failure of such laws. Therefore, De Soto states that all the different social institutions and contracts at a local level need to be integrated in a formal property system. This can be done "by [systematically] building a legal and political structure, a bridge" (De Soto, 2000, p.173) that should

be undertaken by "experienced political operatives" (De Soto, 2000, p.189). Since it is the state's responsibility to emancipate the poor "only … the highest political level can reform command overwhelming support and wipe out the wilful inertia of the status quo" (De Soto, 2000, p.189). By introducing and establishing formal property rights in this way in developing countries, people will be able to rightfully own and control their assets, which is important for their economic development potential. As long as people do not have access to formal property rights, they will remain 'undercapitalised' (Benjaminsen, 2008).

On the other hand, the debates on land tenure arrangements are less focused on the advancement of capitalism and installing private property rights in developing countries because it observes that national legal frameworks for property rights do not always result in the expected (behavioural) outcome. The socio-legal perspective attributes this lack of effect of legal frameworks to three factors: firstly, the behaviour of people living in rural areas is shaped by the social relationships and institutions in which they live. Therefore, externally-imposed laws or policies will often not connect to their social environment. Secondly, legal frameworks for property rights are subject "to various transformations by interpretation or misinterpretation" (Hesseling, 1998, p.102) and this results in a misunderstanding and misconception of the formal laws. Thirdly, societies in developing countries are characterised by customary institutions, national laws, religious laws and even project laws. In other words, they are shaped by "legal pluralism" (Hesseling, 1998, p.102). In order to change or influence the behaviour regarding local land management, the socio-legal theory of land tenure believes that legal incentives should be "flexible and adapted to fit the various local tenure practices" (Hesseling, 1998, p.105).

Thus, these two different schools have a different perception regarding land tenure arrangements and this can be found back in literature of different supranational organisations, such as the United Nations and the World Bank, and key authors in the field of land tenure systems in developing countries.

The ideas put forward by De Soto views the development of formalising property rights as an instrumental and top-down process. Reforms at a national state level determine the rules and procedures for the lower levels and thus influence behaviour at a local level. The United Nations Commission on Legal Empowerment of the Poor (CLEP) concurs with De Soto's perception and states that "[t]o ensure protection and inclusion of the poorest, a broad range of policy measures should be considered. These include formal recognition, adequate representation, and integration of a variety of forms of land tenure such as customary rights, indigenous peoples' rights, group rights, and certificates" (2008, p.65). The successfulness of the governance system depends on its transparency, accessibility and affordability (CLEP, 2008). However, a weakness of this approach is that national property laws might not be specific enough to address problems at a local context level, such as discrimination against vulnerable population groups; despite the fact that national laws confirm the equality of all the citizens (Hesseling, 1998).

In contrast, the socio-legal theory of land tenure states that formal property laws do "not automatically generate incentives for certain kinds of activities or discourage actors from other kinds of behaviour (Hesseling, 1998, p.122). Therefore, the law's successfulness depends on its adaptability to the local level context. By acknowledging the local level context and supporting local institutions, "intermediate forms of land registration (as in Niger and Ethiopia) have been shown to be much more effective – although these need careful checks on abuse by powerful local and external interests, measures that limit disputes … and safeguards to ensure that the needs of those with the

least power – typically women, migrants, tenants and pastoralists – are given due weight" (Toulmin, 2009, pp10-11). This suggested tailored approach includes elements such as:

> "strengthening local institutions for rights administration and just dispute resolution; identifying secondary rights and securing access for tenants, women, migrants and herders, using a phased approach that focuses first on priority areas such as where rapid commercialisation threatens poorer groups' access to land …; introducing simple written contracts with agreed basic terms; and establishing property registers to serve as a base for property taxes that can provide the revenue for services" (Toulmin, 2009, p.17).

This approach can also involve participatory methods including a "local debate to identify guidelines as to what are acceptable or unacceptable forms of land transactions" (Lavigne Delville et al, 2007, p.24). However, a general weakness of this approach is that the methods used for arranging land tenure at a local level depend on the local context and is thus always different and not generally applicable (Hesseling, 1998).

2.3 Land management in Mali

There are different land tenure systems in Mali. On the one hand, there are national land legislations and regulations, and on the other hand, people in rural areas live mostly according to their customary tenure systems.

When Mali became independent from French colonialism in 1960, its legacy regarding land management consisted of some legislation on land registration which had never been finished during French ruling. After 1960, French colonial law continued playing an influence in the nation's land legislation (Hobbs, 1998). For example, on the basis of the French principle of 'domanialité', the Republic of Mali continues to be the formal land owner; unless a plot of land is registered as private property (Hobbs, 1998; Djiré, 2006). Furthermore, the Land Laws of 1986 (*Code Domanial et Foncier*) and 2000 (*Ordonnance du 22 mars 2000 portant Code Domanial et Foncier*), contain other typical French colonial characteristics, such as only recognising individual title deeds and principally establishing land rights on the basis of land exploitation (e.g. farming), which is called 'mise en valeur' (Hobbs, 1998; Djiré, 2006; Djiré, 2007).

Despite the existence of national Land Laws, land is often not registered as private property because registering and titling land involves a lengthy, costly and bureaucratic process. To become a formal private land owner, the following steps need to be taken: "land must be declared and registered as State property before being designated a 'rural concession' or leasehold[3], and the land must first be granted a lease before being registered as freehold under the producer's name" (Hobbs, 2006, p.88). Land that is allocated as a rural concession is land that is granted by the state to someone as "a temporary use right … [which] provide[s] security for making investments (mise en valeur)" (Djiré, 2006, p.vi). However, as long as a rural concession is not registered, it is, according to the Land Law of 2000, not privately owned (Djiré, 2007).

[3] Lease hold is a form of land tenure. It is a right that is exchanged from one party, in thise case the State, to another by means of afinancial transaction for a specific length of time.

Apart from the bureaucracy that is involved with land registration, there are two other reasons why land registration is not very common in Mali. Firstly, the majority of the population lives in rural areas and does not know about such legislation and procedures because they are written and spoken of in French. And secondly, people who reside in rural areas live according to recognised traditional land tenure systems. Thus, at a local level, local institutions, conventions, procedures and rules determine land management (Lavigne Delville et al, 2007).

At the local level, land management is arranged through customary tenure rights and hierarchical customary principles. People living in rural areas gained original customary land rights from "first settlement, conquest, allocation, long occupation or market transaction" (Toulmin, 2009, p.11). Access to rural land is also attained by inheriting it, by receiving the land as a gift or paying a loan for it and, although less common, people can also gain access to land by renting land and by means of sharecropping (Djiré, 2006).

Throughout Mali, there are different customary land tenure systems because of the spread of ethnic groups in different geographical and "production zones" (Hobbs, 1998, p.89). The "Tuareg and some Fulani practice nomadic pastoralism" "in the northern desert and arid plains" (ibid, p.89). In "the north-central floodplains of the Niger Delta ... herding, farming, and fishing are practiced by Fulani and bozo groups" (ibid, p.89). And "the southern and agricultural regions [are] inhabited primarily by Bambara, Senoufou, and Sarakolé peoples" (ibid, p.89) [4]. Among the Bambara people, who form the largest ethnic group in the southern region, the village chief (the man who is related to the family of the first settlers in that area) is allowed to grant tenure rights. Tenure rights are inherited by and granted to men. Women do not inherit land, but work in the fields of their fathers and husbands. Women can acquire land through other means, such as borrowing (Bruce, 2006).

The general, hierarchical customary principles of "kinship, gerontocracy, seniority, indigenousness and gender, to the disadvantage of women" (Djiré 2006, p.4), are important factors determining local people's access to land. The principle of 'kinship' refers to the connection to a kin by blood or marriage, the principle of 'gerontocracy' refers to the old men who govern the political system and the principle of 'seniority' refers to the dominance of the older members of the community in relation to the younger ones; seniority thus undermines the position of the younger siblings (Djiré, 2006). The principle of 'indigenousness' refers to one's 'quality' of being indigenous and refers, for example, to tenants or migrants who have gained (temporal or seasonal) access to land, but whose position with regard to access to land is inferior to that of the descendents of the first settlers.

National and local land tenure arrangements are not always in concert with each other. In fact, there is a gap between the formal land legislations and regulations at a national level and the practices at a local rural level.

Chapter 3 of the Ordonnance of 2000 confirms customary tenure rights officially as use rights. However, these use rights remain undefined and are only recognised as long as the state is not in need of the land where the local communities live or where they make use of (Hobbs, 1998; Djiré, 2007). In the perception of Elbow et al (1998), who categorised the recognition of customary tenure systems by national legislation in West Africa, Mali 'neutrally recognises' community based tenure

[4] The research took place in this region.

systems. However, by only 'neutrally' recognising local land tenure systems, a gap between these two scale levels can continue to exist.

For example, the establishment of the *Code Domanial et Foncier* of 1986 confirms, in principle, the equality among all citizens. However, the Land Ordinance of 2000 and the livestock policy of 2004[5] disregard the position of pastoralists by modernising the livestock industry and only focusing on 'mise en valeur', which favours the position of farmers. This has created tensions among herders and farmers (Benjaminsen & Ba, 2009).

Apart from pastoralists, other groups -such as women, tenants, migrants (Toulmin, 2009) and younger siblings (Djiré, 2006)- are also not treated equally because they enjoy less power at the local level. For instance, even though the 1986 *Code Domanial et Foncier* allows women to register land independently from their male counterpart or fathers, this is rarely done at a local context level (Hobbs, 2006). Independent land registration by women does not often occur because of their unawareness of the existence of formal laws (Cotula et al, 2008a) and because of their recognition of, or obedience to, local customary tenure systems; which usually does not tolerate them to inherit land. Women obtain access to land by being employed, by working for their husbands or fathers, by borrowing land or by grouping with more women (Hobbs, 1998; Klaver & Van Koppen, 1998). Tenants and migrants are also less powerful in their access to land at a local level because of the prevailing hierarchical customary principles of indigenousness, first settlement and kinship. Thus, although formal Land Laws speak of equality among all citizens, local practices show that the different land tenure arrangements allow for unequal access and are not in concert with each other.

2.4 The discussion about land access and cash crops

A case study performed by Benjaminsen et al (2008) in the cotton zone in Mali showed that the commercialisation of cotton and increasing population in that area made original settlers (interested in) selling their lands. Such processes can worsen the position of vulnerable groups who have little access to land and/or who are not (or hardly) involved in the decision-making regarding their access to land. The case study in the cotton zone showed that these informal land transactions played "into the hands of those with power, information and resources" and were a result of a lack of "access to formalisation processes" (Benjaminsen et al, 2008, p.28). This finding is also supported in relation to bio fuel production because "[w]here appropriate conditions are not in place, especially where small-scale farmers do not benefit from security of rights to their land, the poorest groups will tend to lose access to the plots on which they depend (Kimble et al, 2008, p.80).

According to Cotula et al (2008a), the commercialisation of bio fuel crops is expected to generate an increase in land and crop values, which will trigger a demand for land and could subsequently impact people's land access. "[B]ased on the assumption that biofuel crop production is more economically viable than existing forms of land use", the government would be interested in re-allocating land "from local users … to biofuel producers (Cotula et al, 2008a, p.24). In the context of

[5] The UN's Food and Agricultural Organisation (FAO) set up the Pro-Poor Livestock Policy Initiative and seeks to offer "support for local-level, independent organizations [that] may help strengthen organizational capacity of livestock producers and increase their influence in policy formulation" (FAO, 2004, p.16).

customary land tenure arrangements, “changes in land access” may occur “along gender lines, as control over increasingly high-value land may shift from women to men” (Cotula et al, 2008a, p.24; Karlsson, 2008). If people’s land access changes, this is likely to change land use and land tenure. Without regulation, such development of the land rights market will lead to the exclusion of the poorest small-scale farmers and marginalized groups.” (Kimble et al, 2008, p.80).

In customary land tenure arrangements, the exclusion from access to land can involve different things for different groups of people. For example, “landless people are excluded from post-harvest gleaning; husbands take over land from their wives now that the crop is cash rather than subsistence; [and] fallow periods are shorter meaning less land in total for communal livestock grazing” (Cotula et al, 2008a, p.27) and thus “pre-existing small-scale land users” (Cotula et al, 2008a, p.27) might encounter major effects with regard to their land access. However, it is generally assumed that a reduced access to land affects people’s livelihoods negatively and does not contribute to rural development.

2.5 Conclusions

The literature has shown that there are different land tenure arrangements that account for people’s access to land in Mali. ‘Land tenure arrangement’ is defined as the “sets of rules – at some times customs, at others laws – concerning peoples rights to land, together with the institutions that administer these rights and the resultant ways in which people hold the land” (Hesseling, 1998, p.100). The national government of Mali passed the Land Laws of 1986 and 2000 that formally establish how people can gain access to land. However, these are not as important to local people as the customary tenure rights. The customary tenure rights define local’s people’s access to land through hierarchical customary principles, such as “kinship, gerontocracy, seniority, indigenousness and gender” (Djiré, 2006, p.4).

The introduction of cash crops may have the following impact on access to land. The commercialisation of a cash crop, for example a bio fuel crop, may lead to an increase in land and crop values, which can trigger an increase in interest and demand for land. If such a demand for land occurs, this can impact people’s access to land. In the commercialisation of a bio fuel crop, the government could become involved in land re-allocation from local land users to (foreign) bio fuel producers. At village level, a cash crop could lead to powerful groups (e.g. men in relation to women), gaining access to land at the expense of the more vulnerable groups (Cotula, 2008; Karlsson, 2008).

Part 2

Methodology, results and analysis

3 Conceptual model and methodology

3.1 Introduction

Firstly, this chapter presents the conceptual model. This model reflects the most important elements of the introduction, the literature review and the hypotheses stemming from the reflection of the literature. Subsequently, the concepts used in this model are operationalised in section 3.3. The methodology of this research is dealt with in sections 3.4 and 3.5, by elaborating how the selection of the villages and data collection was done.

3.2 Conceptual model

The conceptual model briefly touches upon the elements discussed in Chapter 2 and visualises and summarises the local and national tenure system context and the hypotheses of this research. The arrows from one box to another reflect the direction of cause and consequence of variables. The two-way arrow and the line between the National Jatropha programme and Mali Biocarburant are explained below.

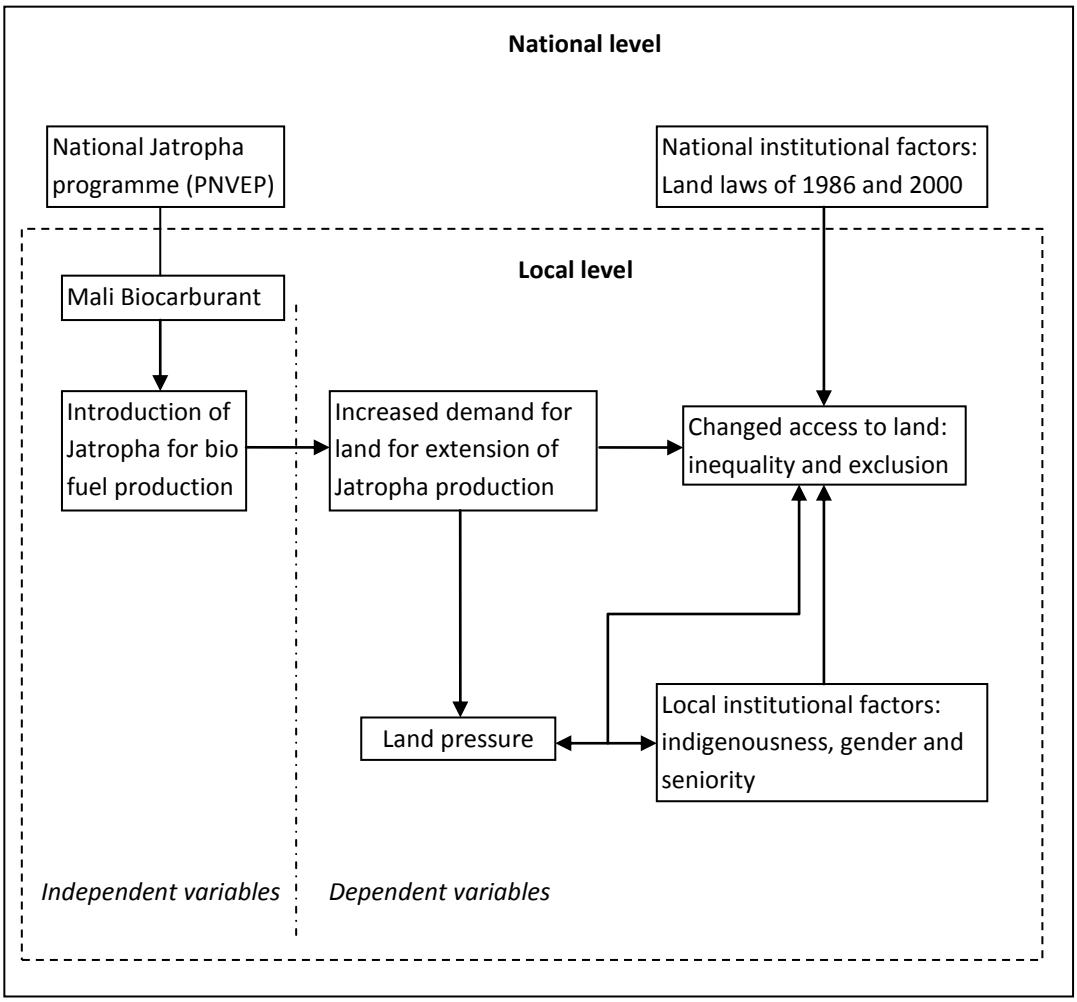


Figure 2 Conceptual model

The conceptual model distinguishes the national and local scale levels. The national level advanced a national programme (PNVEP) to promote rural development through local Jatropha production and to use Jatropha as a bio fuel source, see section 1.2. Furthermore, the national level formulated land tenure arrangements in the form of the Land laws of 1986 and 2000, see section 2.3.

At the local level, and in line with the national Jatropha programme (PNVEP), Mali Biocarburant produces bio fuels from Jatropha nuts; this explains the line between the two boxes in the conceptual model. This bio fuel company introduces Jatropha production in villages by installing field employees there. The field employees share information with villagers on Jatropha production, harvesting and maintenance. Interested villagers start small-scale Jatropha production and harvest Jatropha nuts, which are bought by Mali Biocarburant, see section 1.3.

These are the independent variables of the study, which are divided by the dotted line from the dependent variables on the right hand side. The dependent variables are the variables under study, and are operationalised in section 3.2.

In line with the assumption put forward by Cotula (2008), the commercialisation of Jatropha for bio fuel production can generate an increase in land value, which can trigger a demand for land. If such a demand for land occurs, it is expected that people's access to land will change.

In addition to the land tenure arrangements established by the national level, (local level) customary tenure rights (section 2.3) define people's access to land through five hierarchical principles; indigenousness, gender, seniority, gerontocracy and kinship (Djiré, 2006). The three customary principles of 'indigenousness', 'gender' and 'seniority' are used in this research, see section 3.3.

Furthermore, it can also be hypothesised that the increasing demand for land can also *indirectly* change people's access to land. An increasing demand for land may increase land pressure. However, more importantly, if the increasing demand for land in a village occurs under conditions of high land pressure, it is expected that land pressure, in combination with local institutional factors, influence the outcome of people's access to land. This explains the two-way arrow between 'land pressure' and 'local institutional factors'. It is expected that the relatively more powerful groups[6] will secure their access to land, which might be at the expense of the more vulnerable groups[7]. As a result, the vulnerable groups might experience a worsening in their unequal access to land or even exclusion from access to land.

3.3 Operationalisation of concepts

The conceptual model embraces all the important concepts of this research. In this section, the concepts of 'extension of Jatropha production', 'land pressure', 'local institutional factors governing access to land', 'access to land', 'inequality', 'exclusion' and 'national institutional factors' are operationalised so that they become applicable for research. The description of the operationalisation is rather brief, but Appendix 1-4 provides the four topic lists that were prepared

[6] This is elaborated on in section 3.3 under 'local institutional factors'.

[7] See footnote 6.

for interviews at village level with the village chiefs, men's organisations, women's organisations and Jatropha farmers.

Increased demand for land for extension of Jatropha production

To find out whether there is an increasing demand for land for the extension of Jatropha production, Jatropha farmers were asked in which year they started Jatropha production and on how many hectares. Furthermore, the farmers and/or their family members were asked whether they are interested and have the possibilities to extend the production. The 'possibilities to extend Jatropha production' refers to whether the villagers have access to land and the necessary materials to cultivate the land. Additionally, if Jatropha production started before 2009, villagers were asked how many hectares they produce nowadays, to see whether they have extended their production.

Land pressure

The arrow going from 'increased demand for land for the extension of Jatropha production' to 'land pressure' suggests that only Jatropha production is considered as a factor for land pressure. However, this is not the case. Five other factors that together influence 'land pressure' are:

- Population growth
- Still unused arable village land available
- Intensive land use
- Demand for land from people outside the village
- Land conflicts

There is high land pressure if a village has to deal with processes such as a strongly increasing population, no availability of unused arable land, very intensive land use, many people from outside the village demanding land and land conflicts.

Local institutional factors

Dr Djiré (2006) distinghuises five hierarchical customary principles (see section 2.4). These are indigenousness, gender, seniority, gerontocracy and kinship and are considered as local institutional factors that influence people's access to land. For this research, the local institutional factors under consideration are indigenousness, gender and seniority. These three were chosen because they allow groups to be clearly distinguished from each other (e.g. for gender, there are men and women; for indigenousness, descendents of first settlers and later families that settled later). Moreover, by researching these three principles, information regarding access to land comes from opposing groups and this would not have been easily attained by researching 'kinship' or 'gerontocracy'.

The goal is to find out whether there are differences in the access to land and Jatropha production for people belonging to different groups. These groups are shaped on the basis of these three principles and the following 'population groups' are therefore discerned: founding families and later families[8], men and women and older and younger members of the community. The 'powerful groups' include the founding families, men, and older members of the community; the 'vulnerable groups' include the later families, women and younger members of the community.

On the basis of helicopter interviews, a more detailed operationalisation of the 'seniority' principle is found appropriate. Firstly, the three local institutional factors overlap, which means that a

[8] 'Later families' is used as a term because it is considered to be clearer than a literal translation of the French term 'non-founding families' ('familles non fondatrices').

distinction must be made between men and women of different age categories belonging to either founding families or later families. Furthermore, women's marital status also plays a role in their access to land and Jatropha production. Therefore, the following ten categories within seniority are discerned.

In the group of founding families, the categories consist of:

- Young men, who are considered the productive workforce (age 17-40)
- Older men (older than 40 years)
- Young unmarried women (usually younger than 17 years)
- Married women
- Widows

In the group of later families, the categories consist of:

- Young men, who are considered the productive workforce (age 17-40)
- Older men (older than 40 years)
- Young unmarried women (usually younger than 17 years)
- Married women
- Widows

The acquisition of land and land use for founding families and later families, men and women, and younger and older members of the community is different. In order to better understand people's access to land and their possibility to produce Jatropha, questions regarding their acquisition of land and land use were asked.

Access to land can be defined as "the processes by which people, individually or collectively, are able to use land, whether on a temporary or permanent basis. These processes include participation in both formal and informal markets, land access through kinship and social networks, including the transmission of land rights through inheritance and within families, and land allocation by the state and other authorities (e.g. customary institutions)" (Cotula et al, 2008a, p.8).

There are two elements of access to land: the acquisition of land and land use. The acquisition of land is about how a person or a family obtains land. The individual or family inherits, borrows, owns or formally owns (by means of an obtained or inherited individual title deed) the land. The second element of access to land is about whether a family or a person is allowed to use the land. Therefore, families (and individuals) were asked whether and how they are using land and are producing Jatropha. People's access to land is influenced by local (and national) institutional factors.

There are three important physical characteristics of land that influence its value. First of all, its position, i.e. the proximity of the land to people's housing. Secondly, the soil quality; the more fertile the land, the more productive it is and thus the more valuable. A third physical characteristic is the size of the land. The more land a family has, the more it is able to cultivate and has the possibility to leave land fallow and choose which crops are cultivated in which fields.

Of these three physical characteristics, this research concentrates mainly on the size of land. This is chosen because people (often family chiefs) are well able to state how many hectares the family (or the household) cultivates and leaves fallow and it is easier to compare this characteristic for the different respondents. Moreover, they are also able to indicate whether they have sufficient or insufficient hectares of land.

Inequality is specified as the differences in access to land for different population groups, which are explained by specific (group) features. The differences in access to land are thus related to the acquisition of land and land use.

Exclusion
Exclusion regarding access to land is defined as: "the permanent or temporary non-participation of actors in [land acquisition and land use]" (Panther 1999, p.3 cited in Johnson, 2005). Exclusion, like inequality, occurs on the basis of specific (group) features.

National institutional factors: Land laws of 1986 and 2000
Since Mali's independence in 1960, the Land laws of 1986 and 2000 established the basis for formal land tenure. These laws provide individuals with the opportunity to obtain individual land titles; this research only focuses on individual land titles.

3.4 Selection of the villages

This exploratory study researches the central question of:
Does small-scale Jatropha production result in changes in the differentiated access to land and which institutional related factors account for this?

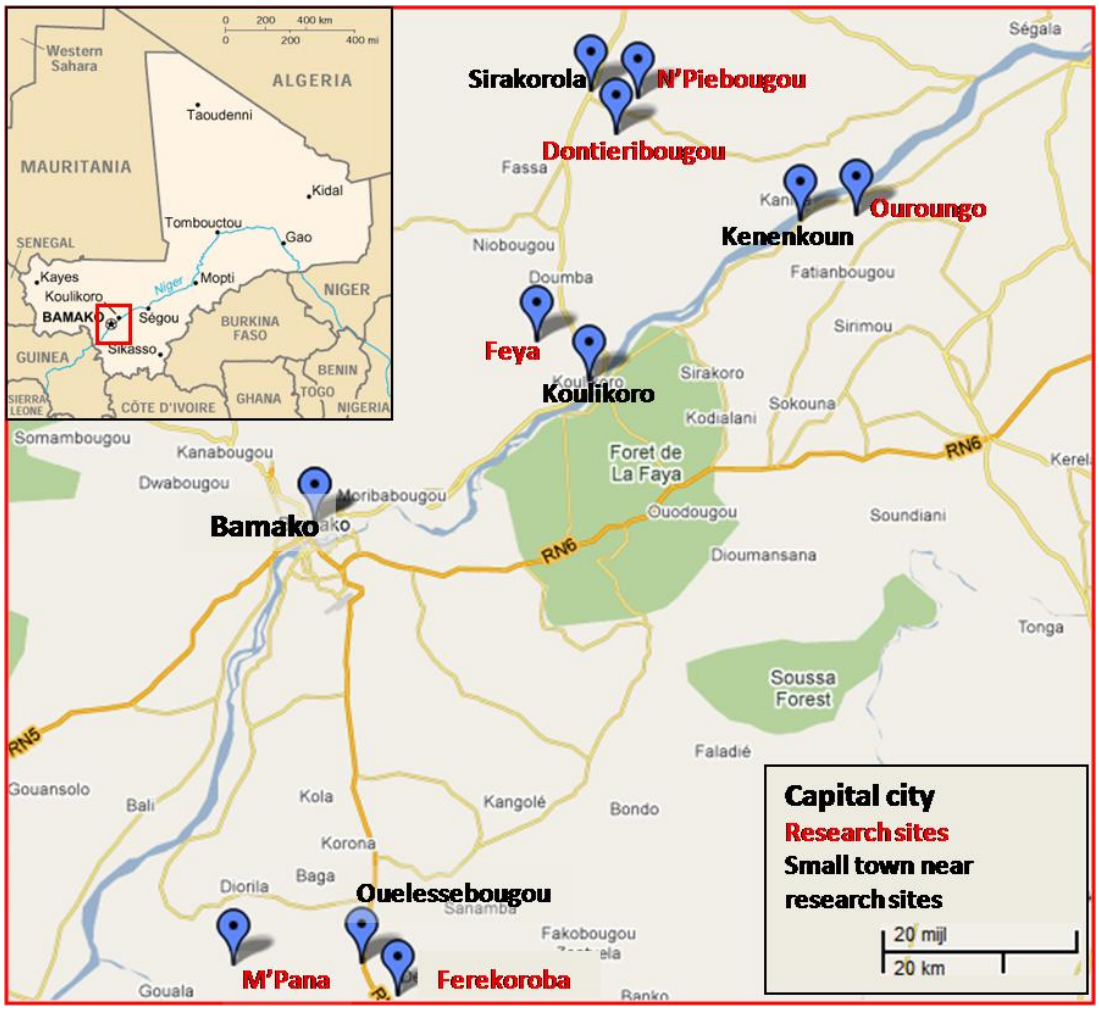
To answer this central question, data was gathered empirically in six villages. These villages were not randomly selected and this section explains the conditions used to select them.

Initially, it was decided to do research in the Koulikoro Cercle, where Mali Biocarburant introduced Jatropha for bio fuel production in 2007, and not in the Kita and Ouelessebougou Communes where the company introduced Jatropha production from 2009 onwards. Over the course of two years, Jatropha production has developed in these villages and it was therefore believed that the hypothesised changes in land demand would be best visible in this area. Four villages in the Koulikoro Cercle were selected for a three month research period. However, because Mali Biocarburant was also interested in obtaining information from villages in the Ouelessebougou Commune, the research was extended to two villages where Jatropha production started in 2009. Consequently, the research period was extended by five extra weeks. The research was performed in Feya, Dontieribougou, N'Piébougou, Ouroungo[9], M'Pana and Ferekoroba (see map 2).

To be able to research the hypothesised change in demand for land and changed access to land, only villages were selected where Jatropha production for bio fuels was introduced by Mali Biocarburant. In these villages, Jatropha had become a cash crop and this might have led to an increase in the value of land, which could be the reason why Jatropha producers possibly obtained more land for Jatropha

[9] Initially, research was started in the small town of Kenenkoun. However, because of problems encountered during the first interviews (see paragraph 3.5.2), it was decided to replace the research in Kenenkoun by research in the nearby village of Ouroungo.

production, or why they possibly experienced a worsening in their (unequal) access to land or even exclusion from their land as result of Jatropha production.



Map 2: The six research sites (sources: Google maps and Academy for Educational Development)

It was decided to undertake the research only in villages that have an 'école de Pourghère' (Jatropha school, see the explanation in section 1.3), to see whether Jatropha production in the nursery and in the fields influenced people's access to land.

Ideally, there would be information available about the size and population of the villages where Mali Biocarburant is active. In this way, the villages with an average size would be selected. Then, it would also be possible to select villages with similar population density characteristics and this information would give an impression about the land pressure in the villages. However, according to Dr. Abou Berthé at l'Institut d'Economie Rurale (IER), such information is not available. Therefore the six villages were selected on the basis of their accessibility, location and the possibilities of field employees to guide the research in the villages.

Because the research took place during the rainy season and the transport to and from these villages was by motorcycle, the villages' accessibility was an important factor for the selection of villages. Some roads became less passable and a bridge was unsafe to cross, and two selected villages had to be replaced for these reasons. Furthermore, the rainy season created water passages in the

rural areas that were sometimes difficult to cross and it was not always possible to cross the Niger River. Nevertheless, it was a matter of time before the trip to the research sites could be continued.

An essential element of a village's infrastructure is its proximity to a small town where there is a weekly market. It can be assumed that the closer a village is to a small town the more land pressure there will be in the area. Therefore, the villages selected were not very close to small towns, but at a distance of 10 to 20 kilometres (see map 2 on p. 27).

The selection of the six villages also depended on the possibilities of field employees to guide the research in the villages, and this was discussed with a former field employee who knows all the field employees very well.

Field employees guided this research because they know the way to these villages. They are also familiar with the village, and know the village chief, the Jatropha farmers and the men's and women's associations. It was only possible to conduct the research with field employees who were willing to guide this research, speak French well and could translate the questions from French to Bambara[10] and the responses from Bambara to French.

Furthermore, it was also deemed important to pick at least one village where a female field employee works. This is because it was expected that a female field employee would have a different (more direct and equal) contact with women living in the villages, and this could facilitate the research regarding the institutional factor 'gender'. With the extension of the research to two other villages, it was again tried to choose one village where a female field employee works. However, because it would be physically difficult for her to drive with me on the motorcycle, her son (who is also a field employee) guided me to the village where she used to work and he translated the interviews.

3.5 Data collection

The Research framework in section 1.4 shows that there are two phases in which data is collected. The research started with a literature review of the possible impacts of cash crops on the access to land and how national and local institutional factors arrange land tenure in Mali. Furthermore, data was empirically gathered during a field work period of almost five months in Mali.

3.5.1 Data collection concerning local institutional factors

During the first three weeks of the field work, helicopter interviews were conducted with a few selected key persons: two village chiefs, five family chiefs, six Jatropha farmers, one president of a village women's association, the Director and Technical Director of the farmer Union ULSPP, colleagues at the factory in Koulikoro and a few field employees. Furthermore, an understanding of the local context (such as the Jatropha nursery system, Jatropha production, fields of men's and women's associations and important geographical and village boundaries such as waterways, paved roads and hills) was gained by field observations. In Bamako, helicopter interviews continued with

[10] Bambara is one of the national languages spoken in the area where research was performed.

colleagues working at the office of Mali Biocarburant, with Doctor Samba Soumaré from IER and with Jaco Mebius from the Dutch Embassy.

On the basis of these helicopter interviews and field observations, topic lists were formulated for interviews with village chiefs, Jatropha farmers and presidents of women's and men's associations. After the trial period, some questions were improved, added and removed. The topic lists give a clear indication of the (type of) questions asked during interviews and are included in the Appendix 1-4.

All the conducted interviews were semi-structured. This form was chosen because it would provide the respondents the possibility of giving new insights that could be of interest for this research and from which I as a researcher could gain a better understanding of the local situation. Interview notes were made during and after the interview. After a few try-outs, it was decided not to continue using the recorder because the noise of bystanders influenced the quality of the interview recorded. Furthermore, I noticed that if I did not completely hear or understand something that was said, I assumed that I would hear or understand it (better) when replaying the recorder. This was not the case and I therefore ceased relying on the recorder and decided to make all the notes during the interviews.

Since qualitative interviews were the most important data collection method in this study, the triangulation of information was done as follows. The village chief was interviewed about the local institutional factors that influence people's access to land. This was because these factors determine the access to land for founding families and later families (indigenousness), for men and women (gender), and for different age groups (seniority). The men and women, and the men's and women's associations answered questions on the hierarchical principles of gender and seniority. Questions regarding the indigenous principle were addressed to the family chiefs of both the founding families and later families. For privacy reasons, especially of the villagers, this paper refers anonymously to the respondents; Appendix 5 provides lists of people interviewed per village.

As explained in section 3.2, the customary principles of 'indigenousness', 'gender' and 'seniority' led to the identification of specific population groups. This implies that the following four categories of (groups of) people were interviewed: the village chief, the men's and women's associations and villagers (see Table 1). The villagers were usually Jatropha farmers, but in some instances villagers who had not (yet) started Jatropha production were also interviewed. The reason for this was to understand their constraints and limitations in commencing Jatropha production. The category of 'villagers' is subdivided into women and men, and, in contrast to the village level, gives an impression of the dynamics at family level.

In Table 1, the total number per row shows how many people were interviewed per village and the cells show how many people of each group were interviewed per village. A total of 66 semi-structured interviews was conducted for the six villages. Besides the interviews with the associations, the number of interviews per village was between nine (in Ouroungo) and thirteen (in Feya). Of the four groups that were interviewed, mostly villagers (with six women and forty-two men) were interviewed. Ouroungo is the only village where no women were interviewed.

Interviews were conducted with the help of field employees of Mali Biocarburant. This facilitated the research because they know how to drive to the villages, have local knowledge about the village and are familiar with the village chief and the farmers. Although the field employees were not interview subjects, they sometimes gave relevant additional information about the dynamics in the villages and improved the insights gained from the interviews.

Village	Village chief	Women association	Men association	Villagers		Total
				Women	Men	
Feya	1	2	0	4	6	13
Dontieribougou	1	1	1	0	8	11
N'Piébougou	1	2	1	2	6	12
Ouroungo	1	0	1	0	7	9
M'Pana	1	1	1	0	8	11
Ferekoroba	1	1	1	0	7	10
Total	**6**	**7**	**5**	**6**	**42**	**66**

Table 1 The villagers interviewed

3.5.2 Data collection concerning national institutional factors

After the field work period, semi-structured interviews were conducted with nine key people on national institutional factors (see table 2). Of these nine people[11], seven are functionaries; one of them is the head of the PNVEP, the Programme that is involved in developing a national strategy for bio fuel production from Jatropha. This programme falls under the responsibility of *L'Agence Nationale de Développement des Biocarburants* (ANADEB), the national agency for the development of bio fuels, which was set up by the *Ministère de l'Energie, des Mines et de l'Eau* (Ministry of energy, mines and water). Consequently, the Director-General of ANADEB was interviewed.

Position	**Working for**
Head of the Bureau	Bureau des domaines et des affaires foncières
Deputy Mayor	Town hall of Ouelessebougou
Sub-prefect	Prefecture of Ouelessebougou
Entrepreneur in car tyres	-
Researcher on land management, access to land and land conflicts in Mali	University of Bamako
Conseiller Technique Architecte Inspecteur en chef des domaines et des affaires fonciers	Ministère du Logement, des Affaires foncières et de l'Urbanisme
Director-General of ANADEB	L'Agence Nationale de Développement des Biocarburants
Head of PNVEP	Programme National de Valorisation Energétique de la Plante Pourghère

Table 2 The nine key people interviewed

[11] There was no need for a translator as the interviewees spoke French.

Two people from the *Ministère du Logement, des Affaires foncières et de l'Urbanisme* (Ministry of housing, land affairs and urbanisation) were interviewed because the Ministry was preparing a national conference on how to harmonise customary land rights and the formal Land Laws of 1986 and 2000.

People were also interviewed from *Bureau des domains et des affaires foncières* in Koulikoro*,* the town hall and prefecture of Ouelessebougou, because leaseholds and individual land titles are requested in these offices and this is where problems regarding leaseholds and individual land titles are dealt with.

In addition, a researcher who works for the University of Bamako and studies land management, access to land and land conflicts in Mali was interviewed. And, an interview was conducted with a businessman from Bamako who is involved in the trade of car tyres and started Jatropha production for Mali Biocarburant SA in 2009.

Specific questions were prepared for each organisation or individual, see Appendix 6. The goal of these interviews was to gain more knowledge about the advantages and disadvantages of the formal land arrangements and to better understand the different positions on the different scale-levels of bio fuel production, see chapter 5. Insights gained with these interviews also contribute to the formulation of recommendations, as formulated in the fifth research question.

3.5.3 Difficulties encountered during data collection

There were two constant difficulties during the empirical data gathering phase. Firstly, the research took place during the rainy season, which made travelling difficult. Secondly, access to land is a sensitive discussion topic; this is especially so at village level.

As explained in section 3.3, the rainy season made villages less accessible because the roads were less passable. Therefore, villages that were difficult to reach were not selected for this research and this sometimes implied waiting for the weather to be good enough to continue travelling to and in these villages. Other difficulties associated with the rainy season are that villagers and field employees were often too occupied for interviews. It is the year's most important period for agricultural production and villagers therefore work long days in their fields. Around this time of the year, field employees of Mali Biocarburant are also too occupied with their work; which mainly entails motivating and helping the villagers with the transplantation of the Jatropha plants from the nursery to the fields. This greatly slowed down the process of data gathering because research could only be started if a field staff worker had time and villagers were found in their fields and were willing to spend some of their time on the interviews. In order to deal with these difficulties, either a stand-in was found for a field staff employer or research in the villages did not take place. Furthermore, the prepared topic list for the villagers was kept as short as possible and, if they were dealt with quickly, took between fifteen and thirty minutes. Other reasons for which the research had to be postponed included a funeral, the weekly market day in a nearby village or town, village celebrations (e.g. there is a customary annual village feast in Feya forbidding women, including me, to go to the fields). In addition, at the beginning of September, the Islamic festival of Ramadan took place and many villagers fasted. The exhausting conditions of fasting and working a lot on the land made people tired and hungry. Despite this, research was undertaken because a field staff employer had the time to guide and translate. Research started as early as 6:30 am until 8:30 am and continued from 7:30 pm until 9 pm, because at those moments people had just finished their breakfasts or were going to eat soon.

Another constant difficulty during the research was that access to land proved to be a sensitive topic and people were sometimes hesitant to talk about it. This hesitation was maybe reinforced by the fact that the researcher was an unknown, white person working for Mali Biocarburant, drinking water out of a plastic bottle, taking notes on a piece of paper with a pen; in other words, a person unlike the locals. The success of an interview depended a lot on the trust that the respondent had in the translator and in the researcher. The role of the translator (usually a field staff employer and sometimes a substitute) was very important; he had to introduce himself, me and the objective of the research clearly and diplomatically. This demanded some social skills, cultural knowledge and willingness from the side of the field employee. In one village, where research had started but was not yet finished, the willingness of the village chief to welcome us for the second time was minimal. Both I and the translator were foreigners and had to explain the purpose of the research a few times before the village chief permitted us to contact other villagers.

Before starting the research in a village, the prepared questions were discussed with the field staff employer to ensure that he or she would understand the objective of the research and the prepared questions. Furthermore, I also stated that if he or she found any question inappropriate, we would either reformulate it or not ask it. During interviews, this occurred regularly. It was very important to be considerate and to prevent an uncomfortable feeling or situation with or among the villager(s). Therefore, the aim was always at conducting interviews without the presence of the village chief and village notables so that people would feel free to respond; unfortunately, this was not always possible. In Ferekoroba, the village chief had stated that later families had a different access to land from the founding families. Most of the interviews took place near him and he was able to hear them. However, as I had heard about a family that had settled later and that was not allowed to produce Jatropha, we ensured that the interview with them did not take place there at that time. We explained to the family why we had decided not to conduct it near the village chief and they felt happy for being treated in such a way and were at ease to talk about the topic. There was no hesitation to speak freely and in fact this interview resulted in insights that would otherwise not have been gained.

As footnote 10 in section 3.4 stated, some problems were encountered in the small town of Kenenkoun. Initially, research had started there but access to land proved to be an especially very sensitive topic. Several villagers of Kenenkoun stated that other trivial matters were more important than the issue of a possible change in access to land resulting from Jatropha production. It seemed as if they were trying to avoid a discussion about people's access to land. Furthermore, because I am a white person who was working for Mali Biocarburant, they assumed that I would be able to change their situation. I therefore had to clearly explain to them that the most I could do was to inform the right people about their problems and that I could not do any more than that. The field employee working in Kenenkoun stated his concern about the research in this small town. If not all villagers were going to be interviewed, people might wonder why some people were interviewed and others were not. To prevent difficult situations, it was therefore decided that the research in Kenenkoun was not to be continued. Nevertheless, some information of the six interviews that were held contributed to insights for this research and is referred to. Appendix 5 provides a list of who was interviewed.

Moreover, two villages in the Ouelessebougou Commune recently experienced friction with land tenure as a result of Jatropha production. This information was retrieved second-hand from a field employee who works in the Ouelessebougou Commune. It was decided not to start conducting interviews in those villages because a visit from a white person working for Mali Biocarburant would

not be well understood and could possibly disrupt the recently reached consensus. Nevertheless, because this information improved some relevant insights for this research, it is briefly mentioned in paragraph 5.2.2.

4 Differentiated access to land and impacts of Jatropha production

4.1 Introduction

Chapter 4 analyses the results of the field work performed in the six villages and serves to answer the second and third research questions.

How is access to land traditionally arranged among founding families and families that settled later, men and women, and older and younger members of the community?

Does the introduction and extension of Jatropha production for bio fuels change the access to land for (these specific) population groups?

Section 4.2 provides some background information by describing certain characteristics of the area where research was performed. Because it is hypothesised that an indirect change in people's access to land can arise from an increasing demand for land for Jatropha production under the conditions of high land pressure (for more information, see section 3.2), the land pressure for each of the six villages is briefly analysed in section 4.3[12].

The second and third research questions are dealt with in sections 4.4, 4.5 and 4.6. These sections discuss the hierarchical customary principles of 'indigenousness', 'gender' and 'seniority', respectively, in relation to people's access to land and Jatropha production. Each of these sections is structured as follows.

Firstly, there is a brief summarisation of how access to land is arranged for the hierarchical customary principle under study. Subsequently, this is elaborated on by reflecting how people's access to land is arranged, which is done by investigating the two elements of access to land: 'acquisition of land' and 'land use'. The three sections continue by looking at whether the introduction and extension of Jatropha production for bio fuels has changed the access to land for the different population groups.

Section 4.7 concludes chapter 4 by summarising the most important results of the research performed in the six villages.

4.2 Area characteristics

The six villages where research was performed are located in the geographic climatic zone of the Sahel. The Sahel is the zone between the Sahara desert in the north and the subtropic areas and savanne in the south. The region is dry, except during the rainy season, which starts around mid-June and lasts for two to three months.

[12] The accompanying descriptions per village are provided in Appendix 7.

Village life is mostly characterised by subsistence farming that is usually undertaken in co-operation with the extended family. Subsistence crops that are grown include sorghum, millet, maize, rice, beans, watermelon and groundnuts. These crops are produced for the family, but people also sell them at weekly markets in a nearby larger village or small town. Women cultivat, 'ingredients for the sauce' in gardens. Such ingredients are tomatoes, onions, gombo and okra, with which the sauces are given flavour.

Besides subsistence crops, cash crops are also grown. An example of a cash crop is cotton. Mali used to be one of the world's largest cotton exporters. Due to the drop in cotton prices, there has been little interest in producing cotton in the past few years. However, it is still produced, especially in the Sikasso area.

People's access to materials to cultivate the land and water is limited. Most families have simple materials, such as a pickaxes, ploughs and cattle, to cultivate the land. The water they use comes from wells. Some families keep livestock (e.g. goats), which is usually sold at markets and not used for family consumption because it is an important source of income.

4.3 Land pressure per village

There is a saying in Mali that 'chaque localité a sa réalité' ('each locality has its own reality'), which implies that every village has its own distinctive reality. This statement holds true for the six villages where research was done and this section therefore discusses the land pressure per village.

Interviews with the village chiefs gave information on village characteristics and land pressure. The topics discussed were the number of inhabitants and changes resulting from rural exodus, births and families that joined or left the village. The discussion also included how acquisition of land is arranged among founding families and later families, men and women, and older and younger community members. The interviews also investigated land use, the production of Jatropha and other cash crops, and changes regarding these issues. Moreover, land scarcity and land conflicts within the village and/or with other villages were discussed.

The information retrieved from these interviews on land pressure is summarised and presented in table 3. On the basis of the results, the last row of table 3 presents an outcome for 'land pressure' per village. On the basis of table 3, some conclusions are formulated on land pressure for each village and an assumption is made about how land pressure might contribute to a changed access to land. Appendix 7 provides a more detailed description about the characteristics and land pressure for each village.

Important factors that contribute to, and indicate, increasing land pressure are: a strong increase in population growth, no more unused arable village land available, very intensive land use, a great demand for land from people outside the village and the presence of land conflicts.

	Feya	Dontieribougou	N'Piébougou	Ouroungo	M'Pana	Ferekoroba
Population growth	Strong increase	Unchanged	Small increase	Strong increase	Unchanged	Small increase
Still unused arable village land available	A lot	A little	None	A little	A little	None
Intensive land use	Fairly intensive	None	Fairly intensive	Fairly intensive	Fairly intensive	Very intensive
Demand for land from outsiders	A lot	A little	None	None	Unknown	A lot
Land conflicts	Yes	No	No, but possible	No (not yet)	No, but possible	Yes
Land pressure	High	No	High	Moderate	Moderate	Very high

Table 3 Land pressure in the villages

Table 3 shows that land pressure per village differs from 'no land pressure' in Dontieribougou to 'very high land pressure' in Ferekoroba.

Of the six villages, only Dontieribougou does not deal with land pressure. However, the village is affected by a severe lack of water, which limits family food production and will probably also limit Jatropha production. Subsequently, the villages of Ouroungo and M'Pana fall in the category of 'moderate land pressure'.

The village chief indicated that there is no high land pressure in M'Pana. This is because there is no change in population growth and there is still unused arable village land available. Because of fairly intensive land use, the village can be considerate to have moderate land pressure. The village chief of M'Pana stated that there are differences in the access to land for founding families and later families. Therefore, land pressure might possibly be experienced more by the group of later families because they are given less. This explains why there is 'No, but possible' in the cell for land conflicts. Land conflicts might arise if later families experience high land pressure and they ask the village chief for more land but he continues to treat them differently from founding families.

Ouroungo is considered to have 'moderate land pressure'. During the course of time, the population has increased strongly, which is an important factor for the fairly intensive land use. However, because the village still has a little unused arable village land available, land pressure is considered to be lower than for the village of N'Piébougou, which has a similar outcome for the other four factors of land pressure. With a small increase in population and no unused arable village land available, N'Piébougou is considered to have high land pressure.

Feya is also considered to have high land pressure. Despite the fact that the village chief of Feya stated that Feya still has a lot of unused arable land available, the other four factors of land pressure indicate that the village experiences an increase in land pressure. The most important factors for an increase in land pressure in Feya are a strongly growing population and an increase in the demand for land by people coming from elsewhere, such as from other villages, e.g. Koulikoro and Bamako.

The only village that has an outcome of 'very high land pressure' is Ferekoroba. Apart from a small population increase, Ferekoroba scores high for the other four factors of land pressure and is

the only village where there is very intensive land use. Moreover, because of land scarcity in the area, Ferekoroba has lent land to Zambougou. However, because of land scarcity in the village, Ferekoroba also borrows land from two other villages. This clearly indicates that there is high land pressure in Ferekoroba.

As mentioned in section 3.2, an increasing demand for land (resulting from the introduction of Jatropha production for bio fuels) can indirectly change people's access to land. An indirect change in people's access to land is assumed to occur when the increasing demand for land occurs under conditions of high land pressure, and local institutional factors, in combination with high land pressure, influence the outcome of people's access to land. In practice, this hypothesis means that, with the introduction of Jatropha production for bio fuels, the vulnerable groups living in the villages with high land pressure (Ferekoroba, N'Piébougou and Feya) might see their access to land worsened in comparison to the vulnerable groups living in the villages with no or moderate land pressure (Dontieribougou, Ouroungo and M'Pana).

4.4 Access to land and the 'indigenousness' principle

The 'indigenousness' principle is about the differences in access to land for founding families and later families. This section treats how the 'indigenousness' principle affects families' access to land and how it affects Jatropha production.

There is a difference in access to land for founding families and later families, in favour of the founding families. Regarding land acquisition, founding families have more land available than the later families. Furthermore, of all the families interviewed, all founding families indicated they have enough land, whereas some later families state they have insufficient land. Logically, the fact that founding families have more land available implies that their land use (which focuses on the number of hectares cultivated for food and that lie fallow) is better than for the later families. On average, founding families have 14.4 hectares fallow land, while later families have an average of 4.1 hectares.

The difference in access to land, i.e. land acquisition and land use, for founding families and later families increases when data of the village of Dontieribougou is excluded. As discussed in section 4.3, Dontierebougou has no land pressure. Moreover, the village chief of Dontieribougou indicated that founding families and later families are treated equally regarding land. Thus, when data of Dontieribougou is excluded, the difference in access to land between founding families and later families increases.

Regarding Jatropha production, there is a slight difference in the disadvantage of later families; they cultivate 1.3 hectares, compared to 2 hectares for founding families. This difference in the disadvantage of later families is explained by the fact that they acquired less land than the founding families. Furthermore, if later families are not given land but lent land, they are usually not allowed to produce Jatropha on it.

Paragraph 4.4.1 discusses in detail the differences in land acquisition for founding families and later families. Paragraph 4.4.2 continues looking at the differences between founding families and later families, but then for land use. Paragraphs 4.4.1 and 4.4.2 also look at the differences between founding families and later families when data from the village of Dontieribougou is excluded. The section ends with paragraph 4.4.3, which discusses the differences in Jatropha production between the founding families and the later families.

4.4.1 Land acquisition

In total, 45 families were interviewed, of which 23 belong to founding families and 22 belong to later families. The results retrieved in the six villages are subdivided into the categories of 'founding families' and 'later families'.

Families were asked how many hectares of land they have and table 4 shows that the acquisition of land for founding families and later families differs. The families can 'own' land if they are descendents from the founding families. Or, when they are (descendents from) later families, they can be either given or lent land. The kind of access later families have differs per village. In Feya, Dontieribougou, N'Piébougou and Ouroungo, the later families were given land by the village chief (or by a founding family that had sufficient land to give). In the two villages in the Ouelessebougou Commune, later families are not given land but are lent land. Also, the amount of land given or lent

to the later families differs per village. In Dontieribougou, for example, a relatively large amount of land was given to the later families, as discussed below.

Land acquisition is 'average hectares of land', which combines the information gathered on 'average hectares of cultivated land' and 'average hectares of fallow land' for all six villages. The average number of hectares of land acquired by descendents of the founding families is 29.8; for later families, this is 17.8 hectares. There is thus a large difference in the number of hectares acquired, namely 12 hectares, which is in favour of the founding families.

The families were also asked whether they consider they have enough land. All founding families responded positively to this question, while of the 22 later families, 15 said they have enough land, 4 do not and 3 did not answer this question.

	Founding families N = 23	**Later families** N = 22	**Difference**
Land acquisition (averages in hectares)	29.8	17.8	12
Enough land	All founding families	Yes : 15 families No : 4 families No response : 3 families	

Table 4 Land acquisition for founding families and later families

There are two reasons why the four later families do not have enough land available. Two of the four families were given land by their own extended family when they settled in Feya; one family settled 20 years ago and the other 9 years ago (female villagers 1 and 2, respectively). As their family expanded over time, the number of hectares given to them became insufficient to support the family. Although both families asked the village chief for more land, he said there was no more land available and thus did not give them any. However, from interviews with other families, who have been able to expand their number of hectares by asking the village chief, it became clear that the village chief hesitates to give land to the families who 'recently' started living in the village (male villagers 2, 4 and 5 in Feya). The village chief is said to be hesitant because he fears the two families will return to where they came from. If more of the village land were to be given to them, the village chief could not reclaim it and thus the village would lose its land to them.

Another reason why later families do not have enough land is explained by the experiences of two families that live in N'Piébougou and Ferekoroba. In both these villages, there is no more village land available for families. One of the two families used to borrow land from another village. However, since this land has been reclaimed by the other village, the family has barely sufficient land (male villager 3 in Ferekoroba).

In contrast to the experiences of later families in Feya, N'Piébougou and Ferekoroba, the later families in Dontieribougou all responded that they have enough land. In fact, the village chief of Dontieribougou stated that each family has been given sufficient land and that they all have enough land to rotate the fields and leave them fallow. Ffor more information, see the village description of Dontieribougou in Appendix 7. Moreover, as explained in section 4.3, Dontieribougou is the only

village that does not experience land pressure. Thus, when the results from this village are excluded from the data set, the difference in land acquisition for founding families and later families is even more unequal, namely 19.8 hectares (see table 5), than is shown in table 4 (12 hectares).

	Founding families N = 20	**Later families** N = 18	**Difference**
Land acquisition (in hectares)	31.6	11.8	19.8

Table 5 Land acquisition for founding families and later families in the five villages

4.4.2 Land use

There is thus a difference between founding families and later families in the number of hectares of land acquired and this also implies that their land use differs. As explained above, land acquisition consists of the average number of hectares of cultivated land and the average number of hectares of fallow land. In table 6, land use for founding families and later families is specified for the number of hectares of cultivated land and fallow land.

Founding families cultivate an average of 15.4 hectares of land, and later families cultivate a little less, with an average of 13.7 hectares. The difference in hectares of cultivated land (1.7 hectares) is small when compared with the difference in hectares of fallow lands. The founding families have access to an average of 14.4 hectares while later families only have an average of 4.1 hectares available. Regarding the number of hectares of fallow land, there is thus a large average difference of 10.3 hectares, in favour of the founding families.

The difference in land use is thus most clearly visible for hectares of fallow land. The fact that the founding families have an average of 14.4 hectares of fallow land explains why they state they have enough land available, as discussed in paragraph 4.4.1. The fact that some later families have no hectares of fallow land (see range 0-15 hectares in the lower right cell) explains why some families state they have insufficient land.

Thus, from tables 4 and 6, it can be concluded that the founding families have more access to land than the later families.

	Founding families N = 23	**Later families** N = 22	**Difference**
Cultivated land (in hectares)	15.4 Range: 6-32	13.7 Range 3.5-40	1.7
Fallow land (in hectares)	14.4 Range 3-40	4.1 Range 0-25	10.3

Table 6 Land use for founding families and later families

As shown in paragraph 4.4.1, the difference between the founding families and later families in land acquisition is larger when Dontieribougou is excluded from the data set. The differences between founding families and later families in land use are also larger when Dontieribougou is excluded from the data set (table 7) than when it is included (table 6).

This implies the following for the difference between founding families and later families in their land use.

	Founding families N = 20	**Later families** N=18	**Difference**
Cultivated land (in hectares)	14.5 Range 6-32	9 Range 3.5-20	5.5
Fallow land (in hectares)	17.1 Range 3 -40	2.8 Range 0- 10	14.3

Table 7 Land use for founding families and later families in the five villages

Table 7 shows that founding families have more cultivated land than later families, namely 14.5 hectares compared to 9 hectares, which gives a difference of 5.5 hectares. The difference is 14.3 hectares for fallow land, in favour of the founding families (who have 17.1 hectares), compared to 2.8 hectares for the later families.

The larger differences for cultivated land and fallow land that are presented in table 7 are explained by the good access to land for later families in Dontieribougou. When comparing the ranges of cultivated land for later families in table 6 and 7, table 7 shows that the exclusion of data from Dontieribougou decreased the maximum land cultivated by later families from 40 hectares to 20 hectares. For fallow land, the maximum number of hectares decreased from 25 hectares to 10 hectares when Dontieribougou is excluded from the data set.

Thus, generally stated, paragraphs 4.4.1 and 4.4.2 show that access to land for founding families is better than that of later families. And, when the exceptional case of Dontieribougou is left out of the data set, the difference in access to land between founding families and later families is even larger.

4.4.3 Jatropha production

This paragraph looks at Jatropha production by founding families and later families. Firstly, this paragraph focuses on how many hectares founding families and later families produced Jatropha in 2009. Subsequently, the differences in Jatropha production between the founding families and later families of before 2009 and after 2009 are discussed. The limitations for the founding families and later families to start or extend Jatropha production are then discussed in detail.

In 2009, founding families produced Jatropha on more hectares than later families. The founding families produced an average of 2 hectares and later families an average of 1.3 hectares. There is thus a difference of 0.7 hectares in favour of the founding families[13] (see table 8).

Before 2009, a similar number of founding families and later families were involved (and not involved) in Jatropha production. Of the 23 founding families, 7 produced before 2009, one family planted a hedge a few decennia ago and 15 families started in 2009. Of these 15 families, 8 live in M'Pana and Ferekoroba, where, in contrast to the other four villages, Jatropha production only started in 2009. Of the 22 later families, 8 produced before 2009 and 14 families did not. Of these latter 14 families, 8 live in M'Pana and Ferekoroba, where Jatropha production was only started in 2009.

Jatropha production	**Founding families** N = 23	**Later families** N = 22
in 2009 (in hectares)	2 Range 0.5 – 4	1.3 Range 0-4
before 2009	Yes: 7 Hedge: 1 No: 15	Yes: 8 No: 14
after 2009	Yes: 8 No: 9 Maybe: 6	Yes: 8 No: 7 Maybe: 7

Table 8 Differences between founding families and later families in Jatropha production

At first sight, there is a similar number of founding families and later families that will be involved in Jatropha production after 2009. Eight founding families will start or increase their production, 9 will not and 6 are interested in extending it. Of the 22 later families, 8 will start or increase Jatropha production, 8 will not and 6 are interested.

Although these results are quite similar at first sight, there is a remarkable difference between the founding families and later families in the reasons why they will not start or extend their Jatropha production.

The nine founding families will not start or increase Jatropha production because, in order of importance, they:

1. want to wait and see whether existing production will succeed (3 families)
2. lack enthusiasm (3 families)
3. lack access to water (2 families)
4. have no land available (1 family)

[13] When information from Dontieribougou is excluded from the data set, founding families still grow Jatropha on an average of 2 hectares while later families grow Jatropha on an average of 1.1 hectares. The difference between the founding families and later families is thus a little larger when Dontieribougou is excluded from the data set.

The later families name the following reasons, in order of importance:

1. No land available (5 families)
2. Lack of water (2 families)

All four families that cannot extend their Jatropha production after 2009 because of a lack of water live in Dontieribougou. Although Jatropha farmers in other villages indicated they sometimes encounter problems with access to water, they did not state that extending Jatropha production was not possible because of a lack of water. A lack of water is thus a typical and ominous problem for Dontieribougou, see the village description of Dontieribougou in Appendix 7.

The five later families that do not have any land available for Jatropha production live in Feya and Ferekoroba. This is thus in line with the hypothesis stated in section 4.3; namely that, with the introduction of Jatropha production for bio fuels, vulnerable groups living in villages with high land pressure (e.g. Ferekoroba, Feya and N'Piébougou) might see their unequal access to land become worse than the vulnerable groups living in villages with no or modest land pressure. Or they may even be excluded from land access. The five later families name two reasons why they cannot start Jatropha production. The later families living in Feya were given too little land to start or extend Jatropha production, and the later families living in Ferekoroba borrow land, on which they are not allowed to start Jatropha production.

Two later families in Feya were given sufficient land for family food production but are unable to start or extend Jatropha production because the family has increased over time and the land is needed for food production. A family that settled in Feya 9 years ago was given 3.5 hectares for a household of 6 people (female villager 2 in Feya). Three hectares are used for family food production and a half a hectare is used for sesame production. The family is interested in starting Jatropha production on 0.5 hectare but is unable to obtain more land because the village chief told them there is insufficient land to give away anymore. Furthermore, the family that gave them a plot of land in the past says it is unable to give them more land because it needs the land for its own family. Because of the difficulties with obtaining more land, the family cannot start Jatropha production and prioritises the production of sesame. This is because sesame can be harvested after a few months, whereas Jatropha can only be harvested after three or four years.

The other family interviewed with similar experiences settled in Feya 20 years ago and started 0.5 hectare of Jatropha production in 2009 (female villager 1 in Feya). The family would like to increase its production to 1 hectare but is unable to obtain more land and cannot use more of its land because it is needed to grow food for the family. The family is interested in Jatropha production because it only earns money by finding wood and producing charcoal.

Three founding families acknowledge that the village chief treats later families and founding families differently with regard to access to land. For example, the wife of the imam of Feya obtained 0.5 hectare of land from the village chief for the production of Jatropha. Moreover, the founding families who have much more land available fear that later families will ask them for land, especially for Jatropha production. Therefore, a founding family started to use the land it owns instead of leaving it unused. The founding family is clearing a field that it has left unused for a long period of time. The trees have been chopped down and Jatropha production will be started there to show later families that the family uses this plot of land and will not consider giving it away or lending it to another family (male villager 4 in Feya; President of women's association 2 in Feya).

Another founding family explained that later families are interested in obtaining more land for Jatropha production because they want to use the land they were given or lent for the family's food production. Because it is possible to only produce just enough on the land they were given or lent, the later families do not want to start Jatropha production on their land but want to obtain land through the village chief or through family chiefs of founding families (male villager 5 in Feya). This is a problem in Feya, and not only in one single neighbourhood. In the weeks after this interview, a meeting should have taken place between the village chief and the village council to discuss this problem. However, because the rainy season started late this year and the villagers were more occupied with this problem, such a meeting was not held[14].

One family in Ferekoroba that has lived in the village for over 200 years is considered to be a family that settled later (male villager 3 in Ferekoroba). The family has 38 members and borrows 16 hectares, which is used for family food production. The family has sufficient access to land, but it is small and therefore it is eager to obtain more land. However, the family is not given any land because it is not one of the village's founding families and can therefore only obtain land by borrowing it from families that have sufficient land to lend.

As explained in section 4.3, land pressure is high in Ferekoroba and the family has therefore been unable to borrow land from the village chief or other founding families. For that reason, the family borrowed land from another village but when it did not use the land for a while, the other village reclaimed it.

Because the family is not given land and only has access to land by borrowing it from other families, it is not allowed to produce Jatropha. As a result of this difficult situation, the family is interested in obtaining a formal land title. From the family's point of view, the best way to secure access to land is to buy a plot of land and formally register it as property. However, the family does not have the money to make such an investment. If one of the family members were to start working in Bamako, the family could save some money but the family is aware that this goal will be very hard to attain.

The only founding family that does not produce Jatropha and states it will not produce it in the future is a family that lives in Ferekoroba. In this research, this family has a unique position because the family has descended from the village founders. Although this usually implies that a family has very good access to land, this family has only a sufficient amount of land available for cultivation, a low number of hectares of fallow land and is not involved in Jatropha production. The family used to have a lot of land but lent a lot of its land to many later families in the villages. In principle, the family is said to have the power to reclaim the land, but it will not ask for it because: «comment les familles vont le survivre?» ("How will the families survive?") (male villager 1 in Ferekoroba). Thus, although the access to land of this family is minimal, certainly in regard to the other founding families, it theoretically continues to have more access to land than the families that borrowed land from the family because, in principle, the family could reclaim the land.

[14] This meeting has not taken place yet.

4.5 Access to land and the 'gender' principle

The 'gender' principle[15] is about the difference in access to land for men and women. In customary land tenure systems, women's access to land is subordinated to men. Women's land acquisition is limited because they cannot inherit land and they need to ask their husbands' permission to borrow land from them. Furthermore, women cultivate less land individually than men and when the family does not have a lot of land, men are allocated land before women. Other factors that influence women's access to land are: day time activities and lack of materials.

Women's land use is sometimes decided upon by men and for individual Jatropha production, women need to ask their husbands' permission. Women in M'Pana and Ferekoroba are not allowed to produce Jatropha and thus in these two villages they are excluded from Jatropha production. In the other four villages, women are allowed to produce Jatropha, but when their production is to be compared with men it is unequal because they cultivate less land with Jatropha, they need to ask their husbands' permission and they are only permitted to start the production if men have determined that it is a successful land use undertaking.

Although there is willingness among women to extend Jatropha production, the above-mentioned factors that explain women's unequal access to land lead to the assumption that men are more likely to extend Jatropha production than women.

This section discusses men's and women's access to land in more detail. Paragraph 4.5.1 is about how men and women and men's and women's associations can obtain land, how many hectares they have available and cultivate. Paragraph 4.5.2 discusses men's and women's land use by looking at what they cultivate individually and with their respective associations, and looks into the different factors that influence their land use. Subsequently, paragraph 4.5.3 discusses men's and women's involvement in Jatropha production.

4.5.1 Acquisition of land

According to local traditions, men inherit land and women do not. When a family chief dies, his oldest son usually replaces him. The oldest son becomes responsible for the family, and one of his tasks includes managing the family's land. The land belongs to the family, but the (new) family chief decides on the access to land of his family members and/or households.

When not the family chief but a male family member passes away, it is not his wife (or wives) who inherits (or inherit) the land, but the male family members. This also happens if a woman who borrowed land from her husband passes away. The land she used to cultivate returns to the family (president of women's association 2 in Feya).

Women do not inherit the land from their husbands or fathers because girls grow up in one village and marry a man from another village. Thus, unmarried female family members leave the village where they were born for the village where their husbands live. Because of these customs, girls are not considered as real villagers. Women's access to land is subordinated to men's access and this has implications for how women can obtain land and what their land use looks like.

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[15] The following information was retrieved from interviews conducted during the field work with the village chiefs, male and female Jatropha farmers, men's and women's associations, and villagers who are not (yet) involved in Jatropha production.

If family food is grown in co-operation with the male members of the family, the number of hectares the men cultivate depends on the number of hectares the family has available for cultivation and the number of hectares it needs to cultivate for all its family members. Because 'indigenousness' is an important factor for a family's access to land, it is not easy to indicate how much land men cultivate; the results of the 'indigenousness' principle are discussed in section 4.4.

A family chief usually gives or lends a plot of land about 1 to 2 hectares to men for individual cultivation. Here, the men produce staple food for their household. If required, a part of their production is also shared with the extended family. The tradition is that married women do not obtain a plot of land through the family chief but through their husbands (Vice president of women's association in Ferekoroba; vice president of women's association in M'Pana). Women respect the traditions by asking their husbands' permission for land and/or to extend the size of land they cultivate. The husband decides upon his wife's (or wives') access to land and a woman is usually allowed to individually cultivate a size of 0.25 to 0.50 hectares. In M'Pana, women cultivate an average of 0.25 hectares individually and the female villagers in Ferekoroba and N'Piébougou individually cultivate an average of about 0.50 hectare. However, the president of one of the two women's associations in N'Piébougou said that women can cultivate up to 1 hectare individually; this is thus more than in the other five villages. On their individual plot of land, women cultivate ingredients for the sauce.

Land is only provided to a woman if the household or family has sufficient to give or to lend. As explained in section 4.4, households or families that settled later in the village are sometimes given a small amount of land and this affects the access to land of the women of these families (female villagers 1 and 2 in Feya). Furthermore, if the family has enough land available to lend to women, the best land is deliberately not lent to women because women would not be willing to give it back later. The best land is said to be used for family food production (president of the women's association in N'Piébougou).

Thus, women's ability to obtain land for individual cultivation is subordinate to that of men in two ways. Firstly, they are allocated less land; secondly, if there is not a lot of land available, land is primarily given to the men.

With a relatively small village, there is one men's and one women's association for the complete village. However, with a relatively large village, there are several men's and women's associations that operate at a neighbourhood level. Land is allocated to these associations by the village chief. In general, men's associations cultivate between 2 to 4 hectares of land. For example, in Ouroungo, the men's association cultivates 4 hectares with millet. The women's associations obtain less land with about 1 to 3 hectares to cultivate. In 2009, the village chief of Ferekoroba decided that the women's association could not cultivate its 1 hectare because the men's association needed an extra hectare for the production of millet and cotton (president of the men's association; village chief of Ferekoroba). This thus shows that the number of hectares obtained by the women's association is thus easily limited for the benefit of the men's association when a village chief decides to do so.

Nevertheless, according to the village chief of N'Piébougou, women's access to land is influenced by external actors such as non-governmental organisations, the Sub-Prefect and field employees of Mali Biocarburant. These external actors have told him «c'est important de donner la terre à l'association de femmes» ("it is important to give land to the women's association") (village chief of N'Piébougou) and that is how women have obtained more access to land in N'Piébougou. He said

that this development can be observed in more villages in the neighbourhood of the town of Sirakorola.

4.5.2 Land use

Not only the acquisition of land differs for men and women, but also their land use. The difference in land use for men's and women's associations is mostly related to the type of work they do. Furthermore, within a family context, women's land use is mostly influenced by their daytime activities, the tradition of asking their husbands' permission to cultivate land and the (lack of) materials available to cultivate the land.

Most men's associations are given a plot of land by the village chief, on which they produce staple food and/or cotton. In some villages, men's association are paid for helping other families with their family food production. The men's association of N'Piébougou is the only men's association of the six villages that does not cultivate any land. Its work consists solely of helping other families with the weeding and cultivation of their land (village chief of N'Piébougou) and it receives CFA 12,000 (€18.30) per day. The money it receives is used for village festivities.

The women's associations in all villages but M'Pana have a field they cultivate and some of these associations also help families. Whereas men's association help families by clearing and cultivating the land, women's associations are mostly involved with harvesting. For example, the women's association in Dontieribougou helps families with harvesting cash crops and receives 5,000 CFA (about €7.60) per day for this. If a women's association helps a family to harvests food, the association is not paid (president of women's association, Dontieribougou).

Depending on the size of the land allocated to the associations, men and women work a half a day or a complete day per week on their association's field. An exception to this is the men's association in Ouroungo. The association cultivates four hectares with millet and works there every Monday and Friday. If a man does not show up to work for the men's association he is fined CFA 50 to CFA 1000 (€ 0.07 to € 1.50). An important difference between unmarried men and unmarried women is that unmarried men are considered as very important workforce and are therefore actively involved in all the villages' men's associations. In contrast, unmarried girls and women will leave their village to marry and are therefore not considered as real villagers (Village chief of N'Piébougou). This implies that, until the moment they get married, they are not allowed to participate in the women's associations.

As mentioned in paragraph 4.5.1, women's associations obtain less land than men's associations and this logically explains why they have less land to cultivate. However, also other factors influence their land use. Because the rainy season started late in 2009, women in N'Piébougou had to help their husbands to cultivate the family lands. Because this took so much time, the women were unable to cultivate the land of the women's association (president of women's association 2, N'Piebougou). Women's land use is thus influenced by the amount of work they do for their family.

Besides working with their associations, men and women work on family lands and individual fields. Their different land use can be mainly attributed to the different daily activities they perform.

Women's daily time activities include preparing two or three meals, collecting wood that is processed into charcoal so that there is an energy source for cooking food, taking care of the children, helping their men with the family field production, and cultivating their individual and communal gardens or fields.

In the hours between the first and the last meals of the day, women mostly take care of the children, work on the family fields and collect wood. Women help the family food production by harvesting the family fields and bringing water and food to the fields where the male family members work (village chief of Ouroungo). Women start to work on their individual fields at around 5 o'clock in the morning, before they prepare their husbands' meals. There, they produce ingredients for the sauce, such as tomatoes, onions and okra. After they have finished preparing food for their family, they continue their work on their individual land; this is somewhere in the early evening from around 6 o'clock onwards (president of women's association 1, N'Piebougou).

In some villages, women say they have enough time to work on their individual and/or communal fields. However, the president of the women's association in Ferekoroba mentions that women «se débrouillent avec le temps ... mais c'est difficile» ("manage their time [to work on the individual and/or communal fields] but it is difficult"). This is in contrast to men, whose daily activities stem from their responsibility to ensure sufficient food for their family. They often work on the family fields in co-operation with their brothers and sons, where, as mentioned above, the female family members also help. Furthermore, they usually also cultivate a plot of land individually and, depending on their willingness and time available, they work there in the early evening. Working on the land is thus how most of their time is spent and is the main part of men's (daily) activities.

As mentioned in paragraph 4.5.1, women need to ask their husbands' permission to individually cultivate a plot of land and also to increase the size of the land they cultivate. Therefore, women's land use depends on whether they are permitted to individually cultivate a plot of land. Moreover, in some cases, men also decide what women need to cultivate. For example, two female villagers living in N'Piébougou cultivate millet and groundnuts (female villagers 1 and 2); in addition, one woman cultivates sesame (female villager 1). Their family chief tells the two women what to produce and this can change on a yearly basis. The women produce what is needed for the family. If they produce more than is needed, they can sell it at the market or use it for their household. Not only is women's individual production decided by men, in Feya, two men decide what the women's association can produce. The women need to inform these two men when they are interested in a crop they do not cultivate at that moment. If the men agree, the women can start the cultivation of that crop; such as Jatropha, in the most recent case (president of women's association 1 in Feya).

Apart from the daily tasks performed by women and the fact that their land use is (to some extent) decided by their husbands, women's access to land is also influenced by their lack of access to materials. Materials that are used by villagers to cultivate the land are ploughs, cattle, pickaxes, fertilisers and pesticides, for example.

The reason why men have much better access to such materials is because they are responsible for family food production and their productivity largely depends on these materials. Furthermore, their work is considered to be tougher than that of women (village chief in N'Piébougou) and they therefore need materials more than women.

For example, the women's association in Feya cultivates 1.5 hectares and has another 4 hectares[16] that is unused. Trees grow on those 4 hectares and the land needs to be cleared before the women can cultivate it. Because the women do not have the strength, time and materials to

[16] This number of hectares for a women's association is exceptionally high in comparison to the other women's associations in other villages.

chop the trees down, the amount of land they cultivate has not been extended (president women's association 1 in Feya).

Also, women do not have the same (amount of) materials available for their individual fields as men. To be able to use materials, women depend on their husbands and sons. At the moments that their husbands do not cultivate land, women can borrow their materials. If the family is rich enough and the husband believes it important for his wife or wives to have materials to cultivate the land, he buys small pieces of equipment (e.g. a pickaxe).

4.5.3 Jatropha production

Jatropha production often takes place on family fields. However, when it is produced individually, it starts on the land that was already given or lent to the men and women. Since the introduction of Jatropha for bio fuel production, mostly men have been involved in Jatropha production. This can be explained by their better access to land (both in terms of size of land they have obtained and the time they spend working on the fields), their better accessibility to materials and, also by the fact that women need to ask their husbands' permission to grow Jatropha. If a woman does not ask her husband's permission, she is not allowed to start Jatropha production (male villager 2 in N'Piébougou; vice-president of women's association in Ferekoroba).

There are a few differences regarding women's involvement in Jatropha production[17] among the six villages. However, in general, it can be stated that women's unequal access to land can be seen in their unequal opportunities with regard to men to produce Jatropha

In Feya, many women produce Jatropha individually. Most men there welcome their wife's (or wives') involvement in Jatropha production. As a Jatropha producer stated: "if the women would like to produce it, I will agree with it" (male villager 4 in Feya). Nevertheless, men would only allow women to produce Jatropha «si c'est une réussite» ("if it is a success") (male villager 6 in Feya). This is why it is normal for men to start Jatropha production and for women to follow later. In Dontieribougou, women are involved in individual Jatropha production. However, because they are not given a lot of land, Jatropha is not grown in their individual fields but is planted as a living fence around their land (president of the women's association). Furthermore, women in the villages of N'Piébougou and Ouroungo have not started individual production yet but they will in 2010.

In contrast to these four villages, women in M'Pana and Ferekoroba are said not to be allowed to produce Jatropha individually. A Jatropha producer from Ferekoroba, who is opposed to women producing Jatropha, stated that "they do not have the physical strength [and] in case women want to produce Jatropha they will not be assisted by the men" (male villager 6 in Ferekoroba). In these two villages, women only produce Jatropha in co-operation with their family (vice-president of women's association in M'Pana; male villager 8 in M'Pana).

As explained above, there are several reasons why Jatropha production is mostly initiated and undertaken by men. Men have better access to land and materials and spend more time cultivating land because their daily activities are less dispersed. It is therefore more likely that more men than women will extend their Jatropha production in the future.

With a total of 30 men, the men's association in M'Pana produces two hectares of Jatropha. There is relatively little land, but because this is the beginning of Jatropha production it does not

[17] In those villages where Jatropha already grew here and there as a living fence, women were involved in harvesting the Jatropha nuts to make soap that they use to wash their clothes.

matter. If Jatropha production goes well in the future, they will ask their village chief for more land to extend the production (vice-president of men's association in M'Pana). Of those male villagers who started Jatropha production individually in 2007, a few have already extended their Jatropha production. For example, a villager in Feya started producing one hectare in 2007, added one hectare in 2008 and another this year (male villager 5). A Jatropha producer in Dontieribougou started with one hectare in 2007 and has now increased his production to three hectares (male villager 1). Men who have not extended their production show their interest in doing so. For example, a villager in Ouroungo states that no one else of his family is interested in Jatropha production, but if the production goes well he will be happy to extend his production (male villager 2). A Jatropha producer in Dontieribougou will see how his three hectares progress over time but he and his family will clear one hectare to extend his Jatropha production in 2010 (male villager 6 in Dontieribougou).

The president of the women's association in Dontieribougou stated that more women have become (and will become) interested in Jatropha production; which is the case in N'Piébougou and Ouroungo where women have not started individual Jatropha production yet but stated they will from 2010 onwards. This is because Jatropha is perceived as an important cash crop with which women hope to earn money. However, because of a lack of time and materials and little access to land, the association's president does not believe women will be really able to extend their individual production.

4.6 Access to land and the 'seniority' principle

Seniority is about the dominant position of older members in a community or family in relation to the younger members. During the first field visits, it became clear that the younger male members of the villages are those in the age category of 17 to 40 years. Men older than age 40 are considered as old and their role in the family and village changes accordingly. These two age categories do not make sense for women. Therefore, also on the basis of first field visits, the following three 'age' categories were defined: unmarried girls or women, married women and widows.

The seniority principle is very important for men's access to land, and much less for women. The village chief is the oldest male descendent of the founding families and decides on other family's acquisition of land. If the family chief passes away, it it his oldest son in line who replaces his responsibilities.

Young men's access to land is subordinated to the older male family members. Unmarried men are given or lend less land for individual cultivation and they need to help their fathers and older brothers. Men's access to land improves when they marry, because they are then given more land and younger male family members help them.

The difference in access to land for young and older women is explained by their marital status. Married women can borrow a plot of land to cultivate, but unmarried women cannot. However, women's access to land is more determined by the 'gender' principle than seniority.

This section firstly examines the acquisition of land for men and women of the different age categories (paragraph 4.6.1). Secondly, the land use of men and women belonging to different age groups is discussed (paragraph 4.6.2). Paragraph 4.6.3 investigates the difference in Jatropha production between younger and older members of the community.

4.6.1 Acquisition of land

The seniority principle is both in the village and family context very important for men's acquisition of land. In the village context, the oldest male descendent of the founding family is the village chief. When he passes away, his oldest son usually takes over his position has the power to distribute land to the other families living in the village (see section 4.5).

Apart from allocating land to the men's and women's associations, the village chief is also concerned with the choice of the president for the men's association. He makes this choice, together with the village council. The president of the men's association in Dontieribougou died at the beginning of 2009. Since then, the village chief and village council have been looking for an "honest, good, serious and courageous" man (village chief of Dontieribougou), who can replace the former president of the men's association.

In the family context, the oldest male family member inherits the land when the family chief (usually his father) passes away. He inherits his father's position and responsibilities as the family chief and has the power to decide on his brothers' and other family members' access to land. The family chief thus decides the distribution of land among his family members and, to some extent, also their land use.

If the family chief is still able to cultivate the fields, he usually has access to more hectares than his younger brothers. A Jatropha producer in Feya states that he cultivates more land because he is the family chief (male villager 2 in Feya). However, if the village chief is too old to work in the field

and also too old to take decisions about land distribution and land use, these decisions can be made by one of his sons. Usually, this is done by the oldest son. In the case of a Jatropha producer in N'Piébougou, since their father's health is not very good, his younger brother is concerned with the family's land issues (male villager 1 in N'Piébougou). Although the Jatropha farmer interviewed is the oldest in line, his younger brother took over this responsibility because he left N'Piébougou for a couple of months to work in Bamako.

The acquisition of land for men is thus explained by their age. Although younger male members of the family have less access to land than the older male family members, the younger males respect these practices. Usually, unmarried men are lent or given a plot of land of about 1 hectare by their father on which they can individually grow food crops. As soon as a man marries, he is given access to more land because he has the responsibility of taking care of his household. Here, the amount of extra land depends on whether the family as a whole produces food for the family, or whether each household is responsible for its own food production. In the latter case, the family chief gives married men sufficient land for the household's food production. Men are also given an individual plot of land, on which they cultivate for their household.

If a younger male family member wishes to obtain (more) individual land or land for his household, he asks his family chief, who then decides. The younger male family members thus respect customary land arrangements by asking the older male family member for more land.

Unmarried men, in the age of 16 to 25 are an important workforce for the village and therefore these young men are actively involved in the men's association.

The acquisition of land for women is based more on the 'gender' principle (see section 4.5) than on the 'seniority' principle. Nevertheless, the acquisition of land differs for unmarried girls and women, married women and widows.

Because unmarried girls and women are likely to marry a man who lives in another village, they are unable to obtain a plot of land on which they can work. Instead, they help the older women with their daily tasks and with the family food production. They are usually not allowed to borrow land to cultivate crops individually. The exception to this is Ferekoroba, where unmarried women can borrow land from their family chief (President of women's association in Ferekoroba). Moreover, all women's associations stated that 'all women' participated in the associations, but in fact only married women are allowed to participate. The reason why they cannot take part in the women's association is because unmarried girls and women will leave their village to marry someone and are therefore not considered as real villagers (village chief in N'Piébougou). The access to land for unmarried girls and women is thus different from married women.

Married women, especially in the childbearing age, help their husbands and/or family with the family food production. In most villages, married women can borrow a plot of land from their husbands on which they cultivate the ingredients for the sauce. Furthermore, married women can join the village's (or neighbourhood's) women's association, which has usually obtained one or two hectares from the village chief.

Older women usually continue being members of the women's association. However, because the work has become too heavy for them, they are no longer involved in cultivating the land. It was not clear whether these older members have anything important to say in women's access to land. However, they usually fulfil important functions such as presiding over the association and taking care of the financial means of the association.

A woman's access to land is unlikely to change if her husband passes away. Although she will not inherit the land because her sons do, she will be allowed to continue borrow. The sons can decide on their mother's access to land, but it is unlikely to change as long as she is able to continue working.

Women's different access to land can be rather explained by the position of the man they are married to then their age. For example, in Feya, the wife of the imam admitted that belonging to one of the founding families gives her advantages over other women, such as women belonging to families that settled later in the village. The wife of the imam explained that she obtained land from the village chief, just because she is married to an important member of the village community. Her advantage regarding the land she wants to obtain is related to the following three issues: the distance from her home to the field, the size of the field she cultivates and soil fertility (female villager 4). This example thus shows that women's access to land is influenced by not only the seniority principle but also by the other two customary principles.

4.6.2 Land use

As stated in paragraph 4.6.1, married men are given or lent more land than unmarried men, because they need to take care of their households. This thus implies that married men can use more land than unmarried men. Whether food is grown in co-operation with the extended family or with the household, the younger male family members help the older male family members. This means that the sons usually help their fathers and younger brothers help their older brothers. The younger male family members thus help the older ones; the reverse also occurs but is less common.

However, apart from Feya, all villages are confronted with a rural exodus. The young unmarried boys and girls go to the capital city or abroad to earn money. Some of them return after a relatively short period of time or return for the rainy season to help their families with the family food production. However, some of them do not return for a long period of time and, for their families, this means that an essential part of their workforce is gone. In some families, this creates an important change in their opportunities to grow enough food for the family. A Jatropha producer in N'Piébougou said that the four hectares his family has for food production is sufficient for the ten family members. However, the food production is barely sufficient. This is partly because of a lack of fertilisers to enrich the soil and partly because there is insufficient manpower to cultivate the family fields. His children went to Bamako and this has left him with the problem of trying to produce sufficient for his family (male villager 5 in N'Piébougou).

The son of the village chief in Ferekoroba is 29 years old and works with nine other male family members on the family fields to produce food for a total of 55 family members. Because his father is the village chief, there is enough land and the family does not lack the means to cultivate land. However, the men only cultivate about 13 hectares, which is insufficient for the food production. His family has many women and children and, because some male family members left the village to start work elsewhere, more work needs to be done by fewer men, thus hampering their family food production (male villager 4 in Ferekoroba).

4.6.3 Jatropha production

The 'seniority' principle also plays a role with Jatropha production. Firstly, unmarried men are said to be allowed to produce Jatropha. However, it is very unusual and, during this research, no unmarried men were interviewed who were allowed to produce Jatropha on their individual fields. As the family

chief usually lends land (as opposed to giving land) to unmarried men, Jatropha production on those fields could imply that unmarried men own the field. Normally, an unmarried man helps his father or family with Jatropha production. As soon as he marries and is given land by his family chief, he could start Jatropha production, after being granted permission by his family chief.

All the male family members have to ask the family chief permission to grow Jatropha. All the villagers interviewed who had wished to start Jatropha production but are not the chief of their family, stated that they had spoken with their family chief about Jatropha production before they started cultivation. Without the family chief's permission, the Jatropha farmers say they would not have considered starting Jatropha production. As, for example, a Jatropha farmer in Ouroungo, states: «sans l'autorisation de mon frère j'aurai abandonné la production de pourghère» ("without the permission of my brother [the family chief], I would have abandoned Jatropha production") (male villager 3 in Ouroungo).

As with food production, it is normal that the younger generation helps the older generation with Jatropha production. For example, Berhamman Diarra and Moussa Coulibaly, two Jatropha producers in Feya, take care of the Jatropha nursery and transplantation of Jatropha in co-operation with their son and younger brother, respectively. However, as discussed in paragraph 4.6.2, a family's land use is sometimes limited because the younger family members leave the village to earn money elsewhere. In one instance, a family stated that this also has consequences for its Jatropha production. A Jatropha producer in N'Piébougou started 0.5 hectare with Jatropha and would like to extend this, but he lacks both the land and the manpower (male villager 5 in N'Piébougou) because his brother has left the village to work in Bamako.

The villagers' land use and Jatropha production are thus influenced by the seniority principle. And field employees of Mali Biocarburant, who are familiar with these customary traditions, act accordingly. The village chief of Dontieribougou explained that mostly family chiefs in his village are interested in Jatropha production because Mali Biocarburant's local field employee had only an informative meeting with them.

As stated in paragraph 4.6.1, the access to land of unmarried girls and women is very limited. In all villages, unmarried women cannot borrow land nor can they cultivate Jatropha individually. They might help their family with harvesting Jatropha nuts, but are not otherwise involved in the production.

In most villages married women are allowed by their husbands to produce Jatropha; yet, in M'Pana and Ferekoroba, women are not. As stated before, women's access to land is inferior to that of men and their unequal access to land is thus more determined by the 'gender' principle than by the 'seniority' principle.

4.7 Conclusions

Table 3 in section 4.3 showed that land pressure differs for the six villages. The only village that does not have land pressure is Dontieribougou. The villages with moderate land pressure are Ouroungo and M'Pana. Despite the fact that Feya still hasa lot of unused arable village land available, it scored high for land pressure. The village of Ferekoroba has very high land pressure because it has no unused arable village land available and borrows land from two other villages. Furthermore, Ferekoroba has high land pressure because land use is very intensive, because there are land conflicts with other villages and because the population has increased a little over the past decennium.

With regard to how access to land is traditionally arranged, it was concluded that women's access to land is more determined by the 'gender' principle than the 'seniority' principle, and men's access to land is more determined by 'indigenousness' than 'seniority'. Furthermore, it can be concluded that the villages showed only different outcomes of access to land for 'indigenousness' and 'gender'. Thus, there were differences between villages in how access to land is arranged for later families and women in relation to founding families and men. In contrast, the 'seniority' principle showed similar access to land for older and younger community members in the different villages.

It can be concluded that the 'indigenousness' principle is the most important principle determining people's access to land because either a family 'owns' land because it descends of the first village settlers or because a family is given or lent a (small) plot of land. If a later family is not given a lot of land, this has impacts on the younger male family members and might mean that the female family members cannot cultivate a garden or field individually.

To briefly conclude how access to land is traditionally arranged among founding families and later families, men and women, and older and younger members of the community, it can be said that the powerful groups have better access to land than the more vulnerable groups.

Thus, the founding families have better access to land than the later families. Moreover, it was shown that, by excluding data of Dontieribougou from the results retrieved from the other five villages, the difference between the founding families and later families in their access to land was even larger. Dontieribougou is the only village where there is no land pressure and founding families and later families are treated equally.

Also, men have better access to land than women. Women's inferior position to access land is explained by the fact that they are allocated less land, have fewer materials available, are involved in other and more daily activities and need their husband's permission to borrow a plot of land.

For the seniority principle, it can be concluded that unmarried men's access to land is unequal to married men's access to land. However, unmarried men in turn have better access to land than unmarried women, because unmarried women are not considered as real villagers because they will marry a man from another village and move to their husband's village.

It was deemed important to know more about the villages' land pressure because it was assumed that land pressure, in combination with local institutional factors, would influence vulnerable people's access to land if there is an increasing demand for land for Jatropha production. Thus, on the basis of the results of village land pressure, it was assumed that the vulnerable groups living in villages with high land pressure (Ferekoroba, N'Piébougou and Feya) might see their access to land

worsen with the introduction of Jatropha production for bio fuels. This was assumed to be less likely for the vulnerable groups living in the villages with no or moderate land pressure, Dontieribougou, Ouroungo and M'Pana.

With regard to the assumed increasing demand for land for Jatropha production, it is clear that the later families in some villages with high land pressure are interested in obtaining more land to start or extend Jatropha production, especially in Feya and Ferekoroba. The later families want to obtain more land because they were not given a lot of land when they settled. However, there is no more unused arable village land available in Ferekoroba and the later families can therefore only obtain land from other families with a lot of land (usually the founding families). In Feya, there is a lot of unused arable village land, but neither the village chief nor one of the founding families interviewed is willing to give later families land for Jatropha production. Thus, whereas these families would like to see a change in their access to land to start or extend Jatropha production, they are unable to obtain more land for Jatropha production because they settled later.

This leads to the conclusion that land access of later families has not changed because of the introduction and extension of Jatropha production. Rather, with the introduction of Jatropha in Feya and Ferekoroba and the interest of later families in producing Jatropha, it becomes more clearly visible that the access to land of later families is restrained by the 'indigenous' principle.

It is possible that the role of the 'indigenousness' principle is more important in villages where there is high land pressure, because the later families were equally treated with respect to the founding families in Dontieribougou, where there is no land pressure.

This research cannot conclude that women's unequal access to land in relation to men has worsened because of the introduction of Jatropha production. Yet, it can be concluded that there are differences between the villages regarding individual Jatropha production by women. In Feya, many women are involved in Jatropha production. Also, in Dontieribougou, women started producing Jatropha individually. In 2010, women in the villages of N'Piébougou and Ouroungo expect to start Jatropha production individually. In Ferekoroba and M'Pana, the women are not allowed to produce Jatropha individually. However, as can be expected with the 'gender' principle, women are believed to be less able to extend their Jatropha production than men.

Although women's unequal access to land did not worsen because of Jatropha production, this research showed that the village chief of Ferekoroba decided that the one hectare cultivated by the women's association would be re-allocated to the men's association so that the men could produce millet and cotton. If this re-allocation from the women's to the men's association were to have occurred for Jatropha production, then it could have been concluded that women's access to land was changed because of Jatropha production. In fact women would have been excluded from their land access, but this did not happen. However, like cotton, Jatropha is a cash crop and cash crop production thus changed women's access to land in Ferekoroba.

Although younger community members do not have the same access to land as the older community members, nothing indicates that small-scale Jatropha production has resulted in a worsening of their unequal access to land.

Thus, neither the introduction nor the extension of Jatropha production for bio fuels has led to a changed access to land for the specific population groups.

5 Discussion of formal access to land and scale levels of bio fuel production

5.1 Introduction

This chapter serves to answer the fourth research question:

Which national institutional factors might account for changes in access to land?

An outline of which national institutional factors may contribute to a change in people's access to land is given by discussing the desirability of individual land titles (section 5.2) and different viewpoints on the optimum scale level of bio fuel production (section 5.3). These two key issues were discussed with nine key people, see table 2 for details.

The insights gained from this chapter and chapter 4, are used for the formulation of recommendations that, in the context of small-scale Jatropha production, aim to prevent both possible exclusion from land access and the worsening of unequal access to land.

5.2 The desirability of individual land titles

Two opposite positions can be discerned regarding individual land titles. Advocates of individual land titles believe that individual land titles can reduce land disputes (paragraph 5.2.1). In contrast, others are more critical and oppose them because they believe that individual land titles contribute to undesired effects such as an increased demand and financial transactions for land in rural areas, especially just outside Bamako (paragraph 5.2.2). These two positions are accompanied by a few examples from villages. For example, an interview was conducted with a businessman from Bamako who is interested in Jatropha production and obtaining an individual land title in the future. At the end of this section, there is a brief discussion on how to better arrange formal and informal land tenure with the practices and (potential) problems occurring in villages (paragraph 5.2.3).

5.2.1 The advantages of individual land titles

The head of the *Bureau des Domains et des Affaires foncières* (land affairs bureau) in Koulikoro and the Deputy Mayor and Sub-Prefect of Ouelessebougou mention the advantages of obtaining individual land titles.

Land disputes in villages are often a result of poorly indicated natural boundaries. Often, natural boundaries, such as trees, hills and water passages, are used to indicate the boundaries of a plot of land. However, problems can arise over time, when land is inherited and these boundaries are not clearly indicated. According to the Deputy Mayor of Ouelessebougou, such land problems would be less frequent with the installation of formal land rights. Formal land tenure would reduce such lack of clarity and thus reduce land disputes (Deputy Mayor of Ouelessebougou). The village chief of Kenenkoun, who used to be a civil servant, is familiar with the (increase in the) value of land and acknowledges that an individual land title reduces the lack of clarity. He obtained a land title for

seven hectares in 1994 or 1995 because the Republic of Mali recognises his land better than the customary tenure system (village chief in Kenenkoun).

Nevertheless, before one can register land and obtain a formal land title, a lease must firstly be granted. During the five years that a person owns a leasehold, he must make certain investments (e.g. build a house or cultivate the land). An amount of 10,000 CFA (about €15) is paid per hectare per year (Head of the land affairs bureau). Providing such investments are made, the land can be registered as a freehold after the five year leasehold. The Sub-Prefet of Ouelessebougou emphasises that people often believe that such leaseholds secure people's access to land, but in fact this does not. One's access to land is only really secured by an individual land title.

The procedures for obtaining a formal land title in villages include the involvement of the village chief and council. They need to show their approval that someone is going to opt for a leasehold for a plot of land in their village by writing a statement that gives their permission for a leasehold[18]. Without their approval, the demand for a leasehold will not be considered. This step in the procedures foresees (some) acknowledgement of customary land tenure and tries to prevent any land conflicts. If, after a five year leasehold, a person wants to register the land of which he wants to become the property holder, the traditional village leader and his council are no longer directly involved in the administrative procedures (Head of the land affairs bureau). Instead, according to the official procedures, the people working on the neighbouring plots of the land for which an individual land title is requested are consulted. Their approval with an individual obtaining a land title is important because this can prevent any disputes. Furthermore, the National newspaper 'L'Essor' includes a 'Commodo et Incommodo' section[19] that states all the demands for formal land titles, and any person disagreeing with such a demand can object to this during a one month period.

5.2.2 The disadvantages of individual land titles

The other position regarding individual land titles is mainly represented by people working for the *Ministère du Logement, des Affaires foncières et de l'Urbanisme* (Ministry of housing, land affairs and urbanisation) and by a researcher who works for the University of Bamako and does research on land management, access to land and land conflicts. Furthermore, the Sub-Prefect of Ouelessebougou and the Head of the land affairs bureau also recognise that the existing formal Land Laws often lead to undesired effects in practice.

The problems that used to occur only in Bamako now also occur in the Ouelessebougou Commune. People from the capital city are drawn to the rural communes to buy land from villagers and, according to the Sub-Prefect, this is why the value of land is increasing in the Ouelessebougou Commune. There are similar experiences in Koulikoro. Villagers do not understand the (potential) value of land and are therefore advised «ne vendez pas de terre de culture aux commerçants» (to "not sell arable land to businessmen") (Head of the land affairs bureau, September 4, 2009). Villagers live from this land and they need to know that selling it to someone else will do no good to them.

This demand for land, financial transactions, leaseholds and individual land titles is fairly new to villagers in rural areas. Therefore, the researcher and the two men working for the Ministry believe

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[18] Also called a 'proces-verbale de palabre'

[19] An example of the 'Commodo and Incommodo' section in the National newspaper *l'Essor* is included in the Appendix 8.

that more care should be taken of these people. Villagers' lack of knowledge and a precarious balance in the social relationships in villages make their position very vulnerable in relation to businessmen, functionaries and local people with more knowledge of the national laws. In addition, as long as the formalisation of land titles remains a complex process, the villagers will remain vulnerable. Therefore, to ensure that public resources in villages do not fall into the hands of businessmen and/or will be used for private purposes, the researcher advocates the fencing of public areas, such as pastoral spaces and fallow land. Fencing such public areas acknowledges the importance of, and is a way to secure, the public's access to these resources.

A businessman involved in the car tyre trade, started cultivating Jatropha in 2009. Five years ago, he obtained 50 hectares of land, 23 kilometres from Sirakorola, in the Koulikoro Cercle. He asked the village chief for land and, after the villagers met together, they decided by popular vote that he could be given the land. In return, and in line with the custom, the businessman gave the village chief Kola nuts; a much-appreciated edible gift. He was given the land because he has the means (e.g. a tractor) to cultivate and thus exploit the land.

Picture 6 Kola nuts

With a tractor, he is able to work on 5 hectares per day. Sometimes, he rents a bulldozer which costs 300,000 CFA (€500,-) per day, excluding 200 litres of petrol[20]; a bulldozer is able to work on 6 to 8 hectares per day. Furthermore, four families live on his land and cultivate it. During rainy and harvest seasons, another villager from a nearby village and ten people from Bamako also work on his land. These people are labourers.

The businessman fenced off the 50 hectares with Jatropha and planted 5 hectares with the intercropping plantation system of five by two. In addition, he has direct-seeding Jatropha production on two hectares. In 2010, he wants to start a Jatropha nursery of 10,000 plants and he hopes to have 20 to 30 hectares with Jatropha production in the future. When his (future) Jatropha production is compared to that of the Jatropha farmers in the six villages where this research was performed, his production is of a larger scale.

The businessman from Bamako wishes to increase the number of hectares up to the point where he is able to exploit it, which will be about 100 hectares. Because the fields alongside his field seem to be unused, he believes he can take that land. «Je ne demande plus» ("I will not ask [for the land] anymore") (the businessman, October 12, 2009) unless it belongs to a neighbouring village, and he is supposed to ask the relevant village chief.

If he were to request permission for a leasehold now, the villagers could oppose his obtaining more land from the village. Therefore, he firstly tries to obtain more land before requesting a leasehold. He is not afraid that the villagers will try to reclaim his land when he tries to obtain a leasehold. This is because he has made large investments in the land by using a tractor, renting a bulldozer and he exploits the land more intensively than they do. The businessman states that if there are people who want to reclaim the land then there will be villagers who agree that he should repaid for the investments made.

[20] The price of petrol in Mali is about 500 CFA or €0.75 per litre.

A befriended businessman has also obtained more land in a similar way in the same area. This other businessman cultivates the land, has a tractor, has rented a bulldozer and also has labourers on his land. Thus, this shows that businessmen do well out of the formal and informal land tenure situation in Mali.

Thus, as the literature review in chapter 2 discussed, with regard to the legal and socio-legal perspectives on individual land titles, there are advocates who believe that individual land titles will reduce land disputes and there are 'opponents' who believe that individual land titles will trigger undesired effects. An increased demand for land and financial transactions in rural areas complicates the position of villagers who live in precarious social relationship and who lack knowledge about formal land tenure.

It became indeed visible that precarious social relationships are complicated in villages when villagers are interested in obtaining land titles. For example, the village chief of Kenenkoun had obtained an individual land title but refused another villager permission to obtain a land title himself. The villager was threatened that all his land would be taken away by the village if he were to continue opting for a land title; he therefore dropped the idea of obtaining a land title (male villager 2 in Kenenkoun).

Overall, villagers are very much against individual land titles. The reasons for this is that user and heritage rights can no longer be reclaimed when land is formally owned by an individual. Furthermore, in the customary land tenure system, land problems are solved amicably whereas with formal land titles, land problems are solved at the administrative level. Villagers rather trust the functioning of the customary tenure system than formal Land Laws that they neither know nor understand.

Land problems in customary land tenure systems among villagers and villages do get amicably solved. For example, N'Dabougou and Bomboya, two villages in the Ouelessebougou Commune, recently had a conflict about an area where villagers of N'Dabougou wanted to start small-scale Jatropha production. The villagers grow family food on these fields and are permitted to do so by the Doumbia family that lives in Bomboya. The Doumbia family is the founding family[21] of an area of about 40km^2, and started to live in the area well before the town and Commune of Ouelessebougou were founded. However, the Doumbia family disagreed with the location for small-scale Jatropha production because it will be unable to reclaim the land in the future if trees are planted there.

Nevertheless, the Doumbia family was not against Jatropha production per sé and pointed to a location where the villagers of N'Dabougou could start the production. After negotiations took place for five months, the proposed location by the Doumbia family was accepted. Although the distance is somewhat inconvenient, the villagers will start their small-scale Jatropha production in 2010 on a plot of land four kilometres away from N'Dabougou (field employee of M'Pana).

Trust is important in the customary system and, as long as there is trust among villagers, this land tenure system is believed to be legitimate. In fact, the existence of individual land titles leads to a feeling of mistrust. The village chief of Ouroungo doubts whether he could trust new families who wish to settle in the village. New families could be interested in obtaining a land title in the future

[21] They are considered as the 'land owners' and if a family wished to establish a village in that area, permission was asked from them. As more villages were founded and it became a more populated area, villages became more independent of these traditional 'land owners'. However, this did not appear to be the case for N'Dabougou, which was also founded a long time ago.

and he would therefore hesitate to give them land. In Kenenkoun, a villager said that the State and people who are interested in obtaining land titles show their mistrust towards the customary system. «Les titres fonciers révoltent les esprits des villageois» ("The land titles go against the spirits of the villagers") (male villager 1 in Kenenkoun) and they are therefore against people obtaining individual land titles, especially in their village.

5.2.3 Searching for appropriate solutions

In the light of the different positions on formal and informal land tenure, the researcher and the *Ministère du Logement, des Affaires foncières et de l'Urbanisme*, are involved in seeking possibilities to better manage land tenure.

When the interview took place with the employees of the Ministry of housing, land affairs and urbanisation, a national conference regarding formal and informal land tenure was being prepared. The goal of the national conference was to discuss how to harmonise customary land rights and the formal Land Laws of 1986 and 2000. A first step is to obtain participation from the local stakeholders, to increase the understanding of local experiences and problems. These valuable local insights are said to be considered at the national level, where the reformulation of the formal land tenure systems will take place. Up to now, what happens at the national level has remained rather abstract. However, an article states that, amongst other things, participants asked for "the translation of the Land Laws to the different national languages" (Touré, 2009).

The researcher is not opposed to formal land registration but is critical about how it is currently arranged. He believes that the national government needs to guarantee good access to land for vulnerable groups, to simplify formal Land Laws and invest in capacity building. The vulnerable groups he identifies are women, younger people, ethnic minorities, pastoralists in sedentary zones and famers in nomadic zones. There should be a measure to prevent their access to land from being affected by the demand for land and land titles.

Capacity building is demanded by international organisations (such as IFAD, FAO and the African Union) and by the Malian population. Ninety percent of the Malian population lives in a customary land tenure system and it is difficult for them to obtain a formal land title. This is because they are not acquainted with the complex procedures and the relevant institutions where they can opt for a land title. An underlying structural problem is that most people are illiterate, do not master the French language and simply do not have the money.

As a result of the Conference organised in December by the Ministry of housing, land affairs and urbanisation, the introduction of the formal land management system is being considered for the school curriculum (Touré, 2009). If this will be adopted in the school curriculum, children will become familiar with how the State has formally arranged access to land.

As formal Land Laws will cause problems in the villages, the researcher proposes that Jatropha should be used on a local level to delineate family fields. Jatropha, as a large shrub, could show which space is reserved for a family (or an individual) without formal land registration being required. The fields should be delineated with Jatropha only if the people who cultivate and/or live on the neighbouring fields are present during the delineating. This to ensure that delineation is agreed by all relevant parties and better secures all people's access to land. Furthermore, to prevent access to public spaces from being lost to bio fuel production or to people coming from outside the village who want to obtain land, the researcher proposes that public spaces are delineated so that the villagers' access to land remains assured.

5.3 Different viewpoints on the optimum scale level of bio fuel production

This research was mostly performed at village level, where small-scale Jatropha production is intercropped with family food production. Mali Biocarburant buys the harvested Jatropha nuts from the farmers and processes the oil obtained from the nuts. The bio fuels are sold on the Malian petrol market for running cars. However, this type of bio fuel production is rather unique. Bio fuels are mostly produced on a large scale and interviews with the nine key people showed that such developments are likely to take place in Mali as well. Therefore, the advantages and disadvantages of small- and large-scale Jatropha production for bio fuels (and bio fuel production in general) were discussed and the standpoints of the different key people are outlined below.

5.3.1 The viewpoints on small-scale Jatropha production

Small-scale Jatropha production for bio fuels is welcomed by the Deputy Mayor and the Sub-prefect of Ouelessebougou, the researcher and, obviously, by the head of the PNVEP. The PNVEP is a programme that has been set up to improve rural development and improve people's access to energy with the cultivation of Jatropha.

According to the researcher, if small-scale Jatropha production is managed well, it can increase farmers' revenues and improve their livelihoods. Jatropha is an extra source of income that can provide an important benefit for Malians living in rural areas.

Apart from an extra source of income, the Deputy Mayor and the Sub-prefect of Ouelessebougou believe there are also other important advantages of Jatropha production. Firstly, Jatropha production creates employment for Malians living in rural areas and this contributes to rural development. In their perception, rural development is much needed in the Ouelessebougou Commune and they therefore hope that Mali Biocarburant will expand its work in this Commune.

Secondly, the Sub-prefect mentioned that Jatropha production might lead to a reduction in the amount of imported petrol and, in the light of volatile oil prices and Mali's geographical position as a landlocked country, a reduction in its dependency on petrol imports would benefit the nation's economic development.

Thirdly, Jatropha production takes place in the Sahel and the most important environmental problem for this geographical climate zone is desertification. The planting of Jatropha could be an effective means to fight desertification and keep land arable so that the people can continue to cultivate their land.

The head of the PNVEP also mentioned other advantages of local Jatropha production. Small-scale Jatropha production increases people's access to energy and improves their quality of life. Villages that produce Jatropha can self-sufficiently provide the oil from Jatropha nuts that is needed in their multi-functional platforms. A multifunctional platform is a diesel engine which, amongst other things, decreases the work of women by mechanically pounding the grains, such as maize and sorghum. It can also be attached to a water pump or battery charger and thus improve people's access to energy (Mali Biocarburant, 2009)[22]. Furthermore, the press-cake from Jatropha oil extraction can be used as a fertiliser to stimulate agricultural productivity.

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[22] This is an initiative by the United Nations Development Programme (UNDP). The UNDP and Mali Biocarburant collaborate to improve and promote the use of these diesel engines in Mali.

The PNVEP welcomes the two roles of Mali Biocarburant; an industry that receives Jatropha from the harvests of small-scale farmers and sells bio fuels on the national market. «C'est une rôle traversant et ça cadre parfaitement dans la stratégie nationale» (Head of the PNVEP, October 26, 2009) (Mali Biocarburant "plays a binding role and this perfectly fits in the national strategy").

An important disadvantage of small-scale Jatropha production is put forward by ANADEB, the national agency that is involved in the development of bio fuel production and which is concerned with formulating rules and regulations for bio fuel production. The agency believes that small-scale Jatropha production in itself is not a problem and that it stimulates local rural development. However, it is very sceptical about the ability, for example, of Mali Biocarburant to organise producers to produce sufficient Jatropha for the national market. It believes that large-scale Jatropha production is needed to produce sufficiently for the national market.

Despite the fact that the researcher mentioned a few positive potential consequences of Jatropha production, he also warns for two potential negative consequences. Firstly, the introduction of Jatropha production in villages, which are sometimes characterised by precarious social relationships, could influence and change people's access to land. Whereas land was initially given to a family, with the introduction of Jatropha production for bio fuels, this could now result in the family that gave the land now considering it as land that is lent. The family that gave (or lent) land to another family would fear it would lose any future claims to the land as a result of the planting of trees, which is regarded as claiming ownership to the land. Bio fuel production from Jatropha could thus influence and change people's access to land.

Secondly, neither small-scale nor large-scale bio fuel production should lead to food insecurity. Because villagers could make money from the production of cash crops like Jatropha, they could shift their interests from food production to Jatropha production. This could result in food insecurity. With large-scale bio fuel production, people living in customary tenure systems might be expelled from their lands by large-scale bio fuel producers. This would stop them from being able to continue producing food on the lands they are used to live on.

5.3.2 The viewpoints on large scale bio fuel production

Logically, of all the key people interviewed, the Director-General of ANADEB, is the biggest advocate of large-scale bio fuel production. The reasons for producing bio fuels on a large scale are that this can partly replace petrol, which is imported and is therefore expensive. Also, it can trigger economic development. The PNVEP is not against large-scale bio fuel production because «on ne peut pas developer sans l'industrie» ("we cannot develop without industry"). Nevertheless, the PNVEP stresses the importance of creating conditions that large-scale producers will need to meet. To obtain the right conditions and regulations, «on suit et on moralise» ("we follow and moralise") (Head of the PNVEP, October 26, 2009) the bio fuel industry.

The (potential) drawbacks of large-scale bio fuel production mentioned are numerous and the researcher, the Ministry of housing, land affairs and urbanisation, the PNVEP and ANADEB all express their concerns about them.

Although the Ministry of housing, land affairs and urbanisation is not directly concerned with bio fuel production, it envisions that large-scale bio fuel production will lead to a strategic problem involving competition between economic development and food production. The Ministry does not expect such a problem to arise easily from small-scale Jatropha production because it assumes that villagers who are involved in small-scale Jatropha production will not replace their food production

by bio fuel production. However, the industry's interest in producing bio fuels is related to making money and nothing else. The Ministry thus stresses the importance of finding a good balance between economic development and food production.

Investors (mostly foreign) are interested in obtaining land in the Office du Niger area. The investors want to obtain land for both bio fuel and food production and the PNVEP is concerned about these developments. The Office du Niger is the country's most well-irrigated and productive agricultural area and bio fuel production here would compete with food production. Head of the PNVEP, is concerned about foreign investors who are interested in obtaining land in Mali. His concern, which is shared by the researcher, is expressed by the following question: how do these developments contribute to the Republic of Mali and the Malian population?

A French company was interested in obtaining 500,000 hectares of land for large-scale bio fuel production. However, according to the Head of the PNVEP, the company did not have the capacity to cultivate an area that large. He believes that the company was only interested in obtaining land. This is just like China, which came to Mali because it 'needs' 2,000,000 hectares of land for bio fuel and food production. However, the Head of the PNVEP believes that China is only interested in cultivating the land for China's own needs and has doubts about the benefits that this would bring to Mali[23].

ANADEB also sees an increase in investors who are interested in obtaining land for bio fuel and food production and «il faut éviter que les multinationaux prennent ou achètent la terre de la population» ("we must prevent land grab[24] or land buying from the population by the multinationals") (Director-General of ANADEB, October 23, 2009). The Agency is involved in setting up rules and regulations and its goal is to find land for investors and set up contracts with them, in an attempt to prevent land grab. However, because the industry is in a hurry to start bio fuel production and the strong petrol lobby is not pleased with an increased market share of bio fuels on the petrol market, the formulation of rules and regulations is hampered.

The different key people do not always share the opinions about the advantages and disadvantages of small-scale and large-scale bio fuel production, but they do agree that rules and regulations are needed for the large-scale production of bio fuels. However, they do not all agree about where large-scale bio fuel production should take place. Both the Head of the PNVEP and the researcher are against large-scale bio fuel production in the Office du Niger area. In their view, this well-irrigated and productive agricultural area should only be reserved for food production. Fertile land should be used for food production and not for bio fuel production. To prevent fertile lands from being used for bio fuel production, less fertile lands that are still suitable for bio fuel production should be identified. For example, the area north of the Office du Niger is unsuitable for food production and it is therefore considered to be a better area for Jatropha production (or production of other bio fuel sources) there.

Moreover, the PNVEP stresses that investors who are interested in obtaining land for bio fuel and food production in Mali can only exploit land if this is in co-operation with the Malian

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[23] Although not in the Office du Niger area, there was a commercial demand for land by Iran in Kenenkoun. The foreign investor was interested in obtaining 500 hectares to produce rice and oranges for its home market. The Republic of Mali did not appear to be against this demand but the villagers disagreed and prevented the Iranians from obtaining any land (male villager 1 in Kenenkoun).

[24] Land grab is a term used for the phenomenon of corporations and governments "buying up farmland in other countries to grow their own food – or simply to make money" (http://farmlandgrab.org/).

population. «On n'est pas opposé à donné des terres si ça sera exploitées avec des Maliens. Une producteur industriel qui prend en compte des producteurs locales est considéré comme un ami du Mali» ("We are not opposed to give land [to foreign investors] if it will be exploited with Malians [because] [a] large-scale producer who takes local producers into account is a friend of Mali") (Head of the PNVEP, October 26, 2009).

In contrast to the Head of of the PNVEP and the researcher, the Director-General of the ANADEB does not see a problem with bio fuel production by (international) investors in the Office du Niger. The industry is needed for economic development and the Agency will therefore search for land for investors who are interested in obtaining land. The Agency indicated that land suitable for bio fuel production can also be found in the Kayes Region, in the West of Mali.

With the formulation of rules and regulations for the bio fuel industry, ANADEB focuses on the following aspects. To prevent competition between food and fuel production, ANADEB wants to prohibit the production of bio fuels from edible oils such as ethanol (from maize) and palm oil. It considers taxing the industry, to provide additional revenues for the national government. The agency wants to legally establish an obligatory mix percentage of bio fuels with petrol, so that the bio fuel industry can really take off. And ANADEB is considering ensuring that the processing of nuts and oil to bio fuels takes place in Mali by prohibiting the export of nuts and oil for bio fuel production.

5.4 Conclusions

To conclude sections 5.2 and 5.3, national institutional factors that might account for changes in access to land include developments on Land Laws and individual land titles and the formulation of rules and regulations for the appropriate scale level of bio fuel production.

Formal Land Laws have already caused changes in access to land in areas where people live according to customary tenure arrangements. There is an increasing demand for land and individual land titles by businessmen, functionaries and local people with more knowledge of the Land Laws in and around the Koulikoro Cercle and the Ouelessebougou Commune. And, although not popular, some villagers are interested in obtaining a land title as well.

Although the government tries to secure people's access to land by offering the possibility of obtaining individual land titles, the existence of formal Land Laws also leads to the continuing unequal treatment of people's access to land. The villager in Kenenkoun who was not permitted by the village chief to obtain a land title, was threatened that his land would be taken away if he were to continue opting for a provisional land title. The existence of formal Land Laws that provide people the possibility to obtaining individual land titles can thus also change their access to land undesirably.

ANADEB, which is involved in formulating rules and regulations for bio fuel production, might also cause changes in people's access to land. Although different people name different reasons why large-scale bio fuel production should not take place or why it should not take place in the Office du Niger area, ANADEB considers large-scale bio fuel production a real possibility in Mali.

ANADEB wants to stimulate the nation's economic development, and it argues that it is therefore wiser to focus on large-scale bio fuel production. Yet, if bio fuel production is to stimulate rural development, a small-scale approach makes more sense. Moreover, when rural development is focused on, the positions of small-scale farmers are properly considered, and possibly also the changes in local people's access to land.

Villagers who are involved in Jatropha production for Mali Biocarburant are unaware of the developments on rules and regulations of (future) (large-scale) bio fuel production elsewhere in Mali and welcome the introduction of Jatropha as a cash crop in their villages. If harvests are good and the Jatropha intercrops well with their family food production, it can potentially improve their livelihoods by increasing their revenues and increasing their access to energy. As mentioned in paragraph 5.3.1, ANADEB fears that it will be hard to organise the producers and it therefore expects that small-scale production will be insufficient for the national market. Whether these fears are justified depends on Mali Biocarburant's capacity to organise well and produce sufficiently to keep a good market position and continue the production in this unique way.

Part 3

Discussions, conclusions and recommendations

6 Discussion, Conclusions and Recommendations

6.1 Discussion

This section firstly discusses the limitations of this research in paragraph 6.1.1. Secondly, the link between this research and literature is discussed in paragraph 6.1.2. Lastly, paragraph 6.1.3 discusses what can be assumed to happen in the future.

6.1.1 Limitations of the research

A few important limitations of this research concern a decision made on the basis of literature review, how data was collected and the conclusions drawn.

The literature review listed five hierarchical customary principles, of which only three were used to research access to land for villagers and a changed access to land resulting from Jatropha production for bio fuels. Although section 3.3 explains why only these three were chosen, the 'kinship' and 'gerontocracy' principles could have contributed to insights gained from this research.

During data collection, the aim was to speak to more or less the same number of later families and founding families, women and men, and younger and older community members. The number of founding families and later families interviewed was equal (23 and 22, respectively). However, many more men than women, and many more older than younger community members were interviewed. Because women and younger community members are groups with more vulnerable access to land, it would have been desirable if more of them had been interviewed. Furthermore, although the aim was to limit the influence of the field employees on data collection, field employees know the villagers and they therefore may have influenced data collection by involving befriended villagers in this research, for example.

Although there were good reasons for undertaking qualitative research, extra quantitative data collection would have been useful to check the qualitative information gathered. The information gathered about the number of hectares are estimations by families and thus cannot be taken as the exact number of hectares they were given or lent.

Regarding the conclusions of this research, an important limitation is that no generalisations can be made for small-scale Jatropha production or the country of Mali. The conclusions are based on the specific characteristics of villages, and only indicate what (different kind of) outcomes regarding changed access to land resulting from the introduction of Jatropha production for bio fuels can be found.

6.1.2 Connection between this research and literature

Literature and research about the impacts of bio fuel production on land focus mostly on *large-scale* bio fuel production. The impacts discussed include varying topics such as the loss of tropical rainforests and biodiversity, and the expulsion of people from their lands and human rights violations. However, in the context of small-scale bio fuel production in Mali, this literature was not found to be very relevant.

The literature review did not identify any earlier research subject similar to this research subject. Furthermore, literature that discusses the possible impacts of small-scale bio fuel production was very limited. Only Cotula et al (2008a) discussed some direct and indirect impacts of bio fuel production on people's access to land. Therefore, specific literature about the consequences of cash crop production (e.g. cotton) on people's access to land in Mali was considered. However, the impacts of cash crops on people's access to land only discussed a changed access to land for women in relation to men. In relation to the Malian rural context, Djiré (2006) identified other local institutional factors and this research thus identified other groups of people who might experience a change in their access to land. Thus, by combining the insights from cash crop production on people's access to land with information about the national and local institutional factors that (can) influence people's access to land in Mali, literature shaped the formulation of the hypothesis and thus this research.

The importance of land pressure on people's access to land or in relation to cash crop production was not mentioned in the literature. However, during this research, it became clear that land pressure is an important aspect for people's access to land and it was therefore included in the formulated hypothesis.

6.1.3 Assumptions

As this was an explorative research, there are some assumptions for the future impacts of small-scale Jatropha production.

In section 4.7, it is concluded that the introduction and extension of Jatropha production has not led to a changed access to land for specific population groups. In other words, the assumption that the introduction of Jatropha production for bio fuels would lead to an increased demand for land, which would then change access to land, has not proven to be correct. However, although this study comes to this conclusion, it is possible that a future increased demand for land which may cause a change in people's access to land at a later date.

Because Mali Biocarburant started its activities in 2007 and it takes about three years before Jatropha can be harvested for the first time, it can be assumed that not all changes in people access to land have occurred yet. It can be assumed villagers' interest in Jatropha production will increase when people harvest Jatropha and start making money. And, when there is an increased interest because of the harvests, land value and the demand for land may increase. This could possibly imply that a changed access to land will be better visible after a few years of Jatropha harvests than it became during this research.

However, it is also possible that the vulnerable groups' access to land will not change but that the difference in Jatropha production for the powerful and the vulnerable groups will change. This could happen because the powerful groups already have more access to land than the vulnerable groups. Paragraph 4.4.3 demonstrated that there is a small difference in Jatropha production between founding families and later families (2 and 1.3 hectares, respectively) and this might increase because the founding families have much more fallow land available than the later families (14.4 and 4.1 hectares, respectively). The founding families thus have much more land available for a possible extension of their Jatropha production and it could also be assumed that the extension of Jatropha production will not change the access to land of vulnerable groups, but will increase the difference in Jatropha production, in this case, for founding families and later families.

As mentioned in paragraph 4.5.1, the village chief of Ferekoroba decided that the men's association would be allocated the 1 hectare cultivated by the women's association for the production of millet and cotton (president of the men's association; village chief of Ferekoroba). Firstly, land pressure plays a role in this situation and shows that women's access to land is inferior to that of men. Secondly, the men's association produces millet and cotton to sell and make money. Although this did not happen for Jatropha production, it can be assumed that such changes in access to land can also happen in the future for Jatropha production because Jatropha is also a cash crop. Such changes could especially occur in villages where land pressure is high and where therefore men are given primary access to land.

This research concludes that there are important differences in land pressure between villages. There is high land pressure in the villages of N'Piébougou and Ferekoroba and it is assumed that if village authorities (e.g. the village chief, the village council and family chiefs) do not treat people equally in these village, then an extension of Jatropha production will lead to a worsening in vulnerable people's unequal access to land, or even exclusion from access to land.

6.2 Conclusions

The objective of this study is to answer the central research question:

Does small-scale Jatropha production result in changes in the differentiated access to land and which institutional factors account for this?

In order to answer this question, an exploratory research was performed in six villages where Jatropha is produced for Mali Biocarburant, in the Koulikoro Region in Mali. Qualitative interviews were conducted with village chiefs, presidents of men's and women's associations and male and female villagers. Moreover, to gain knowledge about national institutional factors that might cause changes in access to land, qualitative interviews were held with nine other key people.

This study concludes that small-scale Jatropha production has not changed people's access to land. There are no indications that the introduction or extension of small-scale Jatropha production has worsened the unequal access to land of vulnerable groups, or has led to their exclusion to access land.

However, this study does conclude that there is unequal access to land for founding families and later families, men and women, and older and younger members of the community, and that the powerful groups are more involved in Jatropha production than the vulnerable groups. Yet, the differences between the powerful groups and the vulnerable groups in the six villages are different.

The differences between the villages can be explained by the statement 'Chaque localité a sa réalité' ('each locality has its own reality'). The research showed that there are three aspects that together form important differences between the villages. Firstly, the villages of Feya, Dontieribougou, N'Piébougou, Ouroungo started Jatropha production in 2007, whereas M'Pana and Ferekoroba only started production in 2009.

Secondly, land pressure in the villages differs. It was concluded that Dontieribougou has no land pressure, Ouroungo and M'Pana have moderate land pressure, Feya and N'Piébougou have high land pressure and Ferekoroba has very high land pressure.

Thirdly, the importance of (certain) customary principles differs in the villages. For example, in M'Pana and Ferekoroba, women are not allowed to produce Jatropha individually. In contrast, a lot of women in Feya individually produce Jatropha.

It is important to take these differences into account, because they make it impossible to formulate generalisations regarding small-scale Jatropha production and changes in access to land.

The three local institutional factors, 'indigenousness', 'gender' and 'seniority', that govern people's access to land, were used to identify how access to land is traditionally arranged. Chapter 4 shows that the powerful groups (e.g. the founding families, men and older members of the community) have better access to land than the vulnerable groups (e.g. later families, women and younger members of the community).

Furthermore, this study concludes that 'indigenousness' is the most important factor governing people's access to land; followed by 'gender' and 'seniority'. The village chief allocates land on the basis of a family's indigenousness, whereby a later family is usually allocated less land than the founding families. This implies that the access of inferior members of the family (e.g. women and the

younger family members) to land depends on how much land was allocated to the family in total. If this is little, the male family members are allocated land rather than the female family members. Also, the older men are given preference over the younger men in land allocation.

Consequently, the 'gender' principle is a more important factor in people's access to land than 'seniority'. One's gender does not change and women have inferior access to land than men by definition. Women cannot inherit land, women have many daily activities that limit their time to work on the land, and unmarried women are not considered as real villagers.

In contrast to a person's gender, a person's age changes over time and thus also a person's access to land. For men, the 'seniority' principle implies that their access to land improves over time. When a man marries, he is given land to support his household. Furthermore, his younger male family members will help him cultivate his land. If a man is the oldest in the line of brothers, he will become the family chief when their father passes away. The younger brothers' access to land is subordinated to the family chief, who allocates family land.

However, women's access to land does not improve much when they become older. Rather, a woman's access to land depends on her husband. If his family has a lot of land, it is more likely that her access to land will be better than that of other women.

This clearly shows that there is unequal access to land and that this is an inherent part of customary tenure arrangements.

This study concludes that small-scale Jatropha production has not changed people's access to land, which implies that small-scale Jatropha production has not worsened the vulnerable groups' unequal access to land, and did not cause people's exclusion from land.

Nevertheless, with small-scale Jatropha production, powerful groups produce more Jatropha than vulnerable groups. For example, the founding families produce Jatropha on an average of 2 hectares, whereas the later families only produce on an average of 1.3 hectares. Furthermore, mostly men produce Jatropha and they have more land for Jatropha production than women. And, mostly older men produce Jatropha and are helped by the younger male family members. Moreover, women and young men need to ask permission from their husbands and family chief, respectively.

Although the above conclusions show that later families' access to land and involvement in Jatropha production is inferior to that of founding families, there are some differences between the villages with regard to later families' access to land and Jatropha production.

For example, there are a few families that settled later in Feya and Ferekoroba and therefore experience difficulties with starting or extending Jatropha production. When these families settled in the villages, they were given sufficient land for family food production. However, because the amount of land is small, they cannot start (or extend) Jatropha production on their land. Therefore, they are interested in obtaining more land for Jatropha production, but they are not given land in Feya because they settled later and more land cannot be given in Ferekoroba because of high land pressure in the village.

In contrast, the village chief gave the families that settled later in the village of Dontieribougou an equal amount of land as the founding families. Therefore, later families do not experience the difficulties described above. This possibly can be explained by the differences in land pressure in the villages. In Dontieribougou, there is no land pressure, whereas there is high land pressure in Feya and very high land pressure in Ferekoroba.

With regard to land pressure in villages, it was assumed that the introduction of Jatropha production for bio fuels might worsen the access to land of the vulnerable groups living in the villages with high land pressure in comparison to the vulnerable groups living in the villages with no or moderate land pressure. However, this study concludes that the introduction of Jatropha has not caused a change in people's access to land, which implies that the assumptions about the role of village land pressure on people's access to land were not correct.

Besides researching local institutional factors that account for changes in people's access to land, national institutional factors that *might* account for changes in access to land were also researched. An important national factor that can cause changes in people's access to land is developments regarding the Land Laws of 1986 and 2000 which provide people the possibility to obtain individual land titles. Advocates of individual land titles believe that land titles can reduce disputes in villages. However, others are more critical and believe that individual land titles lead to an undesired increase in demand and financial transactions for land. Therefore a conference took place about how the formal and customary land tenure systems can be better harmonised and what changes regarding the Land Laws are needed.

If the government improves the possibilities for villagers of obtaining a land title, villagers might be better able to secure their access to land with individual land titles. These possibilities can be improved by capacity building, simplifying the procedures and communicating the procedures not only in French but also in the other languages spoken in Mali. At the same time, improving the possibilities of obtaining a land title does not necessarily mean a positive change in people's access to land. Furthermore, most villagers do not come into contact with individual land titles and are against land titles. In their eyes, people who are interested in obtaining an individual land title show their mistrust towards the customary land tenure system.

Another important national factor that can cause changes in people's access to land is the formulation of rules and regulation for bio fuel production in Mali. ANADEB (the national agency for the development of bio fuels) is responsible for regulating bio fuel production in Mali and thus decides the conditions of bio fuel production in Mali. If ANADEB is for large-scale bio fuel production, people's access to land might change because they need to make space for bio fuel (e.g. Jatropha) plantations. If ANADEB is for small-scale bio fuel production, the conditions it formulates regarding people's access to land might cause changes in their access to land.

The future will show how the discussions and decisions about individual land titles and large- and small-scale Jatropha (or bio fuel) production will evolve and impact people's access to land.

As this was an exploratory study, and both the small-scale Jatropha plantations and the business of Mali Biocarburant will mature, it is hoped that people's access to land will not worsen in the future.

6.3 Recommendations

Small-scale Jatropha production has the opportunity to contribute to rural development. However, because of possible changes in access to land triggered by small-scale Jatropha production, Mali Biocarburant should aim for inclusive rural development.

Aiming for inclusive rural development implies that small-scale Jatropha production prevents people from being excluded from their existing access to land. This means that temporary or permanent non-participation in land acquisition and land use should be prevented. Furthermore, inclusive rural development also entails that small-scale Jatropha production should prevent a worsening in people's unequal access to land. Unequal access to land occurs when different population groups have differing access to land because of specific group features.

The difficulty with preventing exclusion and preventing a worsening of unequal access to land is that unequal access to land is inherent to the customary tenure arrangements. The local institutional factors of 'indigenous', 'gender' and 'seniority' are customary principles that determine people's access to land. It is not possible to formulate recommendations that change local institutional factors in such a way that inequality in, and exclusion from, to access to land are banned. Instead, the recommendations are modest and try to take the whole complex situation into account.

The most specific recommendations are formulated for Mali Biocarburant (see paragraph 6.3.1) and are especially related to the outcomes of the study regarding 'indigenousness' and 'gender' principles. In addition, some brief recommendations for the village and national level are also made, see paragraph 6.3.2.

6.3.1 Mali Biocarburant

One of the most important factors for the bio fuel company is to consider land pressure in the villages where it is to introduce small-scale Jatropha production. Introducing a cash crop like Jatropha in a village with high land pressure can trigger a worsening of unequal access to land for the more vulnerable groups and possibly even lead to people's exclusion from access to land. It is suggested to at least consider the five factors of land pressures, as in this study. If there appears to be another factor (or other factors) that indicate a village's land pressure, this (or these) should be included.

Information on village's land pressure provides information about the following issues. Firstly, such information indicates whether there are (potential) conflicts between families or people regarding land allocation and/or land use; such (potential) conflicts can have serious consequences for the access to land of vulnerable groups. Also, a village's land pressure can indicate (potential) competition between food and Jatropha (or any other cash crop) production. In addition, if a village has high land pressure, this indicates that the village has no or very limited possibilities to extend Jatropha production and it might not be worthwhile for the company to start introducing Jatropha for bio fuel production.

Information about a village's land pressure can be retrieved through interviews with the village chief and the village council. Because the village authorities are important local key people who decide families' and associations' access to land, they can provide valuable insights into the village's land pressure. Nevertheless, although information retrieved from the village chief and council might indicate that there is no high land pressure in the village, this might be experienced differently by more vulnerable groups. For example, the village chief might not see the position of later families objectively. Mali Biocarburant should be aware of this and consult the pre-defined vulnerable groups

(later families, women and younger members of the community) to gain an impression of their access to land. By improving its insights on a village's land pressure and the vulnerable groups' access to land, Mali Biocarburant can try to prevent a worsening of people's unequal access to land or prevent exclusion from access to land.

Secondly, as suggested by the researcher Dr Djiré, access to land can be better secured by delineating fields with Jatropha in the presence of the users/owners of the neighbouring fields. This recommendation is specifically for family fields. This helps to secure a family's access to land in two ways. In the first instance, Jatropha is a tree and is therefore considered in customary systems as a means to claim (informal) land ownership. Therefore, Jatropha delineations can better secure a family's access to the land. In the second instance, when the users/owners of the neighbouring fields agree with and are witnesses of the delineation, this can prevent conflicts between families and legitimise the delineation. If the delineations of a family field causes problems, this is the right moment to consider how difficulties should be tackled.

It makes sense to focus on the delineation of family fields rather than on individual fields because rural Malian society mostly works as family units. By better securing their access to land, the whole family sees that its family food production is better secured. Moreover, the strategy of delineating individual fields could possibly trigger conflicts within the family about who is going to be allocated how much land. Therefore, it is argued that the delineation of individual fields should not be paid any attention by Mali Biocarburant. The management of family land is the responsibility of the family chief and if there are people within families who wish to delineate their individual fields, this could be considered as a family matter that is to be dealt with within the family.

Later families' access to land could benefit from the delineation of family fields. However, this study shows that this recommendation might not be applicable in all situations. For example, a few families that settled later in Feya and Ferekoroba were given a small plot of land, sufficient for food production. However, they are unable to start or extend their Jatropha production on this land. Therefore, they are interested in obtaining more land, but the families in Feya are not given more land because they settled later. Moreover, there is very high land pressure in Ferekoroba and thus no more land available. Mali Biocarburant might come across such situations more often, but a recommendation concerning this matter cannot be formulated for Mali Biocarburant and is therefore directed at the national government, see paragraph 6.3.2.

Thirdly, research at village level shows that the access to land of women and women's associations is limited by different factors. These factors are the little number of hectares provided to the women and their associations, their numerous daily activities, the need for their husbands' permission to cultivate land and the lack of materials. These differences among men and women are inherent to customary traditions. Nevertheless, the village chief of N'Piébougou stated that external actors have influenced women's access to land in N'Piébougou and in other villages around the small town of Sirakorola. Mali Biocarburant could try to improve women's involvement in Jatropha production, and thereby possibly also their access to land, by explaining the importance of women's (associations') participation in Jatropha production for the village's welfare.

Fourthly, women lack access to materials which restrains their possibilities to cultivate land. Therefore, women's access to land would be improved if they were to have the materials to cultivate land. However, there are two problems with providing materials to the women's associations. The

first problem is that Mali Biocarburant will have to make an investment. The second problem is that if women are provided material and men are not, this might lead to some disagreement. Therefore, Mali Biocarburant could consider providing women with a micro credit or setting up a micro credit system with which women can obtain materials.

6.3.2 Village and national levels

If a village has high land pressure, this should be considered before Jatropha production for bio fuels is introduced. Under conditions of high land pressure, the village authorities (e.g. village chief and village council) should consider whether Jatropha production is going to benefit the development of groups with relatively good access to land or potentially lead to the exclusion of vulnerable groups' access to land or to a worsening of their unequal access to land.

As Jatropha production could become a source of income for associations and lead to rural development, the villages could consider giving (more) land to the associations so that associations could earn money. For example, the men's association in N'Piébougou and the women's association in M'Pana earn money by working on family fields and are not allocated land. They could extend their sources of income if they were allocated land for Jatropha production.

Although unequal access to land is inherent to the customary land tenure arrangements, the position of the vulnerable groups (e.g. later families and women) is nevertheless important for the welfare of their family. Therefore, their possibilities of obtaining more access to land could not only lead to inclusive rural development but also improve the welfare of their families, which should not be undervalued by the village.

The purpose of the formal land laws is to provide people with the opportunity to obtain individual land titles. However, the formal land laws do not fulfil this purpose because people lack the possibilities to obtain land titles. People are unfamiliar with individual land titles, the procedures are complex and in French, and most Malians cannot obtain a leasehold and pay 10,000 CFA (about €15) per hectare for five years. These are all important limitations that the national government should consider in the harmonisation of the Land Laws and the customary land tenure arrangements. This could imply that the government will have to focus on simplifying the procedures and translating them into the different national languages, informing people about land titles and making it financially possible for Malians who have no money to obtain land titles.

Furthermore, the Land Laws of 1986 and 2000 talk about women and their rights to obtain a land title. The government is aware that women in customary land tenure systems are treated unequally to men. However, this research shows that also later families should also be considered as a group that deserves more attention. Their access to land is unequal to that of founding families and they cannot easily improve their access to land. Therefore, the government should possibly set up policies to better regulate their access to land.

6.3.3 Recomendations for further research

As assumed in paragraph 6.1.3, the increased demand for land might occur when villagers start harvesting and are paid by Mali Biocarburant; this could possibly cause the hypothesised change in access to land. Therefore, it is recommended that a similar research project to this one is performed in a few years time, that considers the limitations of this research described in paragraph 6.1.1.

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8 Appendix

Appendix 1 : Topic list for interview with the village chief

Caractéristiques des résidents du village

1. Combien de résidents à peu près y a t il dans le village?
2. Il y a combien de chefs de familles dans le village (inclus le chef de village)?
3. Il y a combien de familles fondatrices et comment ils s'appellent?
    - Noms de familles :
4. Il y a combien de familles qui se sont installées dans ou après les années de sécheresse de 1970 – 1980 et comment ils s'appellent?
    - Noms de familles :
5. Quel group d'ethnie est majoritaire dans le village?
6. Y a-t-il d'autres ethnies dans le village?
    a. Si oui, laquelle ou lesquelles?
    b. Quelle(s) famille(s) appartient/appartiennent à l'autre ethnie/ aux autre ethnies?
        - Nom de famille : L'ethnie :
7. Est-ce qu'il y a des quartiers dans le village?
    a. Si oui, comment ils s'appellent?
8. Est-ce qu'il y a une association des femmes?
    Si oui: qui est la présidente?
9. Est-ce qu'il y a une association des jeunes?
    Si oui: qui est le président?
10. Est-ce qu'il y a des hameaux?
    a. Si oui : il y a à peu près combien de gens qui habitent là ?
    b. Si oui: pour quelle période est-ce que les gens habitent là?
11. Pendant les dernières 10-15 ans, est-ce que le nombre des résidents dans le village a :
    a. diminué
    b. resté le même, ou
    c. augmenté?
12. Dans les dernières 10-15 années, est-ce qu'il y avait un exode de jeunes?
    a. Si oui, est-ce surtout des garçons et/ou des filles qui partent?
    b. Pourquoi ils (ou elles) partent?

L'accès à la terre et les changements général :

1. Est-ce que la terre appartient à la famille ou au ménage ?
2. Est-ce qu'il y a une grande différence de nombre d'hectares entre les familles suivantes ?
    - Familles fondatrices – familles non fondatrices
    - Familles du group d'ethnie majoritaire – familles du/des group(s) d'ethnie minoritaire(s)
3. Est-ce qu'il y avait un changement de nombre d'hectare d'utilisation des terres suivantes pendant les dernières 10-15 années?
    - Terres cultivées
    - pâturage
    - forêt
    - marginale
    - en jachère (qui n'appartient pas aux familles) (fait partie d'un système de rotation ?)
    - hameaux
    - autres terres (?)
4. Champs communs

- Ça appartient à qui? (chef de village / l'association de femmes / l'association de jeunes / ….)

5. Champs individuels avec propriété privée?
    - Ça appartient à qui?
6. Le nombre d'hectare de la terre du village, est-elle assez pour tous les résidents?

<u>Les facteurs institutionnels (les normes sociales et les changements administratifs) :</u>

- Qui est la propriétaire terrain?
- Quel pouvoir est-ce qu'il a (encore)?

La propriété des terres au village et les changements:

1. Est-ce que les gens au village peuvent avoir des terres en propriété privée? Ça veut dire :
    - Est-ce que les gens peuvent le vendre?
    - Est-ce que les champs peuvent être empruntés sur gages par la propriétaire?
2. Est-ce que les gens au village possèdent leur terre pour un temps indéfini sans être propriétaire?
    - Est-ce que les droits d'usage peuvent être hérités?
    - Est-ce que les champs peuvent être empruntés sur gages par la propriétaire?
3. Est-ce que les gens au village possèdent leurs champs *temporellement*? Ça veut dire :
    - Est-ce que les champs peuvent être empruntés?
    - Est-ce qu'un propriétaire peut pris en bail un champ?
    - Est-ce qu'il y a d'autres arrangements temporellement?
4. Est-ce que il y a des champs qui appartiennent au commun?
    - Est-ce que les champs sont utilisés par plusieurs familles?
5. S'il y a une famille avec beaucoup de terre disponible mais ne l'a pas utilisé pour longtemps, pourriez- vous (=chef de village) la redistribuer à une famille avec beaucoup des hommes / bras solide?
6. S'il y a une famille qui part, à qui appartient la terre qui la famille quitte?
7. Est-ce qu'il y assez de terre dans le village pour une nouvelle famille de s'y installer? Institutions moderne: est-ce qu'elles ont une influence sur le village? Un droit d'usage qui est devenu une concession rurale pour cinq ans (sans immatriculation) / Immatriculation / Titre foncier.

<u>Des changements liés à l'accès à la terre et l'introduction et la production de pourghère</u>

1. La production du pourghère est faite par la famille ou le ménage ?
2. Est-ce que les femmes et les jeunes sont intéressés de le produire ?
3. Qui ne produisent pas (encore) le pourghère ?
4. L'école de pourghère:
    - Il y a combien d'endroit(s) de l'école de pourghère ?
    - La terre appartient à qui ?
    - Qui a assigné la terre ?
    - Comment était la terre utilisée avant l'installation de l'école de pourghère ?
        i. La terre était non utilisée ou marginale
        ii. La terre faisait une partie d'une famille
        iii. ….
5. Quelle terre est utilisée pour la plantation de pourghère ?
    - les champs communs du village
    - les champs des familles
    - les champs individuels
    - les champs qui sont emprunté
    - autres champs (lesquels ?)
    - toutes les réponses mentionnées
6. Parmi ceux qui produisent le pourghère, est-ce qu'il y avait une augmentation d'intensité de la terre?
7. Est-ce qu'il y avait une augmentation de la demande aux terres, par :

- ceux qui produisent ?
- ceux qui ne produisent pas encore mais qui sont intéressée à produire le pourghère ?
- des familles immigrantes ?

8. Est-ce que vous vous attendez à une augmentation de la demande aux terres pour la production du pourghère?
9. Est-ce qu'il y a des gens qui ont perdu de la terre à cause de la production du pourghère?
10. Est-ce qu'il y a des disputes lié à la terre à cause de la production de pourghère?
11. Est-ce que le pourghère remplace / remplacerait d'autres culture de rente?
12. Est-ce qu'on gagne plus avec le pourghère qu'avec d'autres cultures de rente?
13. Il y a assez de terre pour la production de pourghère?

<u>L'influe de pourghère sur les moyens de vie</u>

1. Est-ce que les producteurs ont récolté des grains?
2. Est-ce que les producteurs on reçue de l'argent avec la récolte?
3. Est-ce que vous vous attendez à une augmentation de revenues de la production de pourghère?
4. Est-ce que le pourghère remplace/remplacerait d'autres culture de rente?
5. Est-ce que le bien-être des producteurs/villageois a amélioré à cause de revenues de la production de pourghère?
6. Est-ce que la production de pourghère à une influence sur l'exode de jeunes?

Appendix 2 : Topic list for interview with the men's association

<u>En général:</u>

1. Comment est-ce que l'association de jeunes s'appelle ?
2. Qu'est-ce que l'association des jeunes fait?
3. Il y a combien de jeunes associées ?
4. Sont toutes les jeunes du village associées ?
    a. Si non : qui ne sont pas associées et pourquoi pas ? (exclusion ?)
5. Les jeunes membres ont quel âge ?
        - Entre … et … ans (17 – 40 ans ?)
6. Est-ce que l'association gère de la terre ?
7. Comment est-ce que l'association de jeunes a obtenu cette terre ?
8. Qu'est-ce que l'association cultive sur cette terre ?
    a. cultures pour la consommation familiale et/ou cultures commerciales ?
9. Qu'est-ce que les femmes cultivent dehors l'association ?
    a. culture pour la consommation familiale et/ou culture commerciale ?
10. Est-ce que l'association de jeunes cultive du pourghère ? Depuis quand ?
11. Est-ce qu'elle produit d'autres cultures de rente ?

<u>La terre de l'association de jeunes :</u>

1. Il y a combien d'hectare pour l'association de jeunes ?
2. Le champ pour l'association de jeunes se trouve où ? à … km du village
3. Le champ a quel type du sol ?
    a. Sablonneuse
    b. Argileuse
    c. Côte
    d. Bas-fond
4. Est-ce qu'il y a assez de terre pour l'association de jeunes ?

<u>Jatropha :</u>

1. Est-ce que l'association de jeunes a commencé une école de pourghère ?
    - Si non, y a-t-il des :
        - Pépinières
        - Semi direct ?
2. Si oui : se trouve-elle sur le champ de l'association de jeunes ?
3. Il y a combien de producteurs de pourghère ?
    - Est-ce que toutes les jeunes de l'association y sont associées?
4. S'il y avait une école de pourghère / des pépinières, est-ce que la transplantation est faite sur le champ de l'association de jeunes ?
    - Si non : où est-ce que les petits pieds sont transplantés ?
5. Il y a combien de pieds de pourghère sur le champ de l'association de jeunes ?
    - S'il y a d'information sur les suivants :
        - Pieds qui sont transplanté :
        - Pieds qui sont morts :
        - Pieds qui sont replanté :
6. Quand est-ce que les jeunes y travaillent pendant la saison de production?
    - Chaque jour
    - Quelques jours par semaine
    - Une fois par semaine
    - ….
7. Est-ce que les jeunes ont assez de temps pour y travailler ?

Les normes sociales par rapport à la terre

La position des jeunes :

1. Comment peuvent les jeunes hommes célibataires de ce village avoir accès à la terre pour la cultiver ?
    a. seulement par une association avec des autres jeunes
    b. par un don du chef de famille
    c. par un don de son père (=chef de ménage)
    d. par emprunt
    e. toutes les raisons mentionnées
    f. ….
2. Est-ce que les hommes mariés peuvent avoir un champ individuellement ?
    a. Si non, pourquoi pas ?
    b. Si oui : comment est-ce qu'ils peuvent obtenir un champ individuellement dans ce village ?
        i. par un don du chef de village
        ii. par un don du chef de famille
        iii. par un don de son père (=chef de ménage)
        iv. par emprunt
        v. par achat
        vi. par héritage
        vii. toutes les raisons mentionnées
        viii. …
3. Est-ce que les jeunes hommes célibataires peuvent avoir un champ individuellement ?
    a. Si non, pourquoi pas ?
    b. Si oui : comment est-ce qu'ils peuvent obtenir un champ individuellement ?
        ix. par être donné un champ par le chef de famille
        x. par être donné un champ par leurs pères
        xi. par prêté
        xii. par achat
        xiii. par héritage
        xiv. toutes les raisons mentionnées
        xv. …
4. Est-ce qu'un jeune homme célibataire peut produire le pourghère lui-même ?
    a. Si non, pourquoi est-ce que l'association des jeunes peut produire le pourghère et pas un jeune homme célibataire ?
    b. Si oui, est-ce que vous pensez qu'un jeune homme célibataire a assez de moyens pour entretenir la production de pourghère ?
        i. Assez de temps
        ii. Assez de matériels (seau, puit etc.)
    c. Est-ce qu'un jeune homme célibataire doit demander l'autorisation pour produire le pourghère ?
5. Est-ce qu'il y a des grandes différences entre les jeunes du village et le nombre d'hectare qu'ils cultivent ?
    a. Par exemple : les hommes de la famille du chef de village ou des hommes d'autres familles importantes ont-ils plus de terre pour cultiver que d'autres hommes ?
    b.

Des changements liés à l'accès à la terre et la production de pourghère

1. Est-ce que la plantation de pourghère aboutit dans un extra demande pour la terre de l'association de jeunes?
2. Est-ce qu'il y a une autre culture de rente (par exemple le coton) qui a aboutit dans un extra demande pour la terre au village? Si oui : laquelle/lesquelles ?
3. Est-ce que l'association de jeunes s'intéresse à d'avantage de production de pourghère ?

4. Est-ce que les jeunes sont intéressées de produire de pourghère avec leur ménage ou la famille (alors en dehors de l'association de jeunes) ?
5. Est-ce qu'il y aura dans l'avenir plus de terre disponible pour l'association de jeunes pour la production de pourghère?
6. Est-ce qu'il y a des ménages ou familles qui ont perdu de la terre à cause de la production de pourghère ?
    a. Si oui, qu'est-ce qu'il est passé ?
7. Est-ce qu'il y a des disputes liées à la terre à cause de la production de pourghère ?
    - Si oui, quels problèmes se posent?
        - Par exemple, les gens qui ont emprunté des terres voulaient y commencer la production de pourghère.
    - S'il y a des disputes, comment est-ce qu'elles sont abordées et résolues ?

<u>L'influence du pourghère sur les moyens de vie :</u>
Depuis que l'association de jeunes produire le pourghère a-t-elle changé son utilisation du sol, des mains d'œuvre et des intrants ?
L´influence sur le travail :
1. Est-ce que l'association des jeunes gagne plus de l'argent avec la production de pourghère qu'avec ce qu'elle produisait avant ?
2. Est-ce que le volume de travail a augmenté par rapport à ce que l'association de jeunes produisait avant ?
    - Si oui : comment ?
3. Est-ce que vous utilisez des intrants pour le pourghère ?
    - Si oui : lequel / lesquels ?
        i. Engrais
        ii. Fumier
        iii. De l'eau
        iv. Pesticide
4. Si oui: est-ce que la production de pourghère a besoin plus des intrants que ce que l'association de jeunes produisait avant ?
    - Si oui : comment ?

L´influence sur les moyens de vie :
1. Est-ce que l'association de jeunes a récolté des grains de pourghère ?
    - Si oui : depuis quand ?
    - Si oui : est-ce que les grains étaient vendus à Mali Biocarburant et est-ce que les gens ont reçu de l'argent ?
    - Si oui : combien pour un kilo de grains ?
2. Qui récolte les grains dans l'association de jeunes?
    - Toutes les jeunes qui font partie de l'association de jeunes
    - Les hommes de certaines famille ou ménages
    - Les hommes âgés
    - Les hommes jeunes
    - ….
3. Qui gagne de l'argent avec la production de pourghère?
    - Toutes les jeunes qui font partie de l'association de jeunes
    - Les hommes qui font le travail
    - ….
4. Qu'est-ce que l'association des jeunes fait avec l'argent qu'elle a gagné avec la production de pourghère ?
    - Est-ce que l'argent est dépensé aux besoins communs ?
    - Est-ce que l'argent est divisé par les jeunes ?
    - ….

5. Est-ce que le bien-être des jeunes est amélioré à cause des revenues de la production de pourghère ?
6. Est-ce que vous vous attendez à une augmentation des revenues avec la production de pourghère dans les années suivantes ?
    - Si oui : est-ce que l'association de jeunes veut augmenter ses investissements de la production de pourghère ?
7. Est-ce qu'il y a d'autres cultures de rente qui sont vendus pour l'argent ?
    - Si oui : ce sont lesquels ?
    - Si oui : qu'est-ce que les jeunes font avec l'argent ?
    - Si oui : est-ce qu'il y a aussi des investissements communs fait avec l'argent qui était gagné avec les autres cultures de rente ?
8. Est-ce que la production de pourghère remplace/remplacerait d'autres culture de rente
    - Si oui : c'est pourquoi ?
    - Si oui : est-ce que c'est parce qu'on gagne plus avec la production de pourghère ?
9. Est-ce que la production de pourghère a stimulé des jeunes de rester au village pour gagner d'argent avec la production de pourghère?

Appendix 3 : Topic list for interview with the women's association

<u>En général:</u>

1. Comment est-ce que l'association de femmes s'appelle?
2. Qu'est-ce que l'association de femmes fait?
3. Il y a combien de femmes associées?
4. Sont toutes les femmes du *village* ou du *quartier* associées?
    - Si non : qui ne sont pas associées et pourquoi pas ? (exclusion?)
5. Les femmes membres ont quel âge?
        - Entre … et … ans.
6. Est-ce que l'association gère de la terre ?
7. Est-ce qu'il y a des hommes qui décident ce que l'association produit?
8. Comment est-ce qu'elle a obtenu cette terre?
9. Qu'est-ce que l'association cultive sur cette terre?
    - cultures pour la consommation familiale et/ou
    - cultures commerciales
10. Qu'est-ce que les femmes cultivent dehors l'association?
    - culture pour la consommation familiale et/ou
    - culture commerciale
11. Est-ce que l'association cultive du pourghère? Depuis quand?
12. Est-ce qu'elle produit d'autre culture de rente?

<u>La terre de l'association de femmes :</u>

1. Il y a combien d'hectare pour l'association de femmes ?
2. Le champ pour l'association de femmes se trouve où ? à … km du village
3. Le champ a quel type du sol ?
    a. Sablonneuse
    b. Argileuse
    c. Côte
    d. Bas-fond
4. Est-ce qu'il y a assez de terre pour l'association de femmes ?

<u>Jatropha :</u>

1. Est-ce que l'association a commencé une école de pourghère ?
    - Si non, y a-t-il des :
        - Pépinières
        - Semi direct ?
2. Si oui : Se trouve-elle sur le champ de l'association de femmes ?
3. Il y a combien de productrices de pourghère ?
    - Est-ce que toutes les femmes de l'association y sont associées?
4. Est-ce qu'il y a aussi des femmes qui produisent le pourghère en dehors de l'association de femmes ?
5. S'il y avait une école de pourghère / des pépinières, est-ce que la transplantation est faite sur le champ de l'association de femmes ?
    - Si non : où est-ce que les petits pieds sont transplantés ?
6. Il y a combien de pieds de pourghère sur le champ de l'association de femmes ?
    - S'il y a d'information sur les suivants :
        - Pieds qui sont transplanté :
        - Pieds qui sont morts :
        - Pieds qui sont replanté :
7. Quand est-ce que les femmes y travaillent pendant la saison de production?
    - Chaque jour

- Quelques jours par semaine
- Une fois par semaine
- ….

8. Est-ce que les femmes ont assez de temps pour y travailler ?

<u>Les normes sociales par rapport à la terre</u>

La position des femmes en dehors de l'association de femmes

2. Comment peuvent les femmes de ce village avoir accès à la terre pour la cultiver ?
    a. seulement par l'association avec d'autres femmes
    b. par un don de chef de famille
    c. par un don de son mari
    d. par emprunt
    e. par héritage
    f. par toutes les moyens mentionnés
    g. autrement …..
3. Est-ce que les groups de femmes suivants peuvent avoir un champ individuellement ?
    a. les femmes célibataires
    b. les femmes mariées
    c. les veuves
4. Est-ce que des femmes mariées peuvent hériter la terre de leur marie quand il meurt ?
5. Est-ce qu'une femme peut planter des arbres sur le champ qu'elle cultive?
6. Est-ce qu'une femme peut produire le pourghère elle-même ?
    a. Si non, pourquoi est-ce que l'association des femmes peut produire le pourghère et pas une femme elle-même ?
    b. Si oui, est-ce que vous pensez qu'une femme a assez de moyens pour entretenir la production de pourghère ?
        i. Assez de temps
        ii. Assez de matériels (seau, puit etc.)
7. Quel est le nombre d'hectare moyen cultivé par les femmes?
8. Est-ce qu'il y a des grandes différences entre les femmes du village et le nombre d'hectare qu'elles cultivent ?
    a. Par exemple : les femmes de la famille du chef de village ou des femmes d'autres familles importantes ont-elles plus de terre pour cultiver que d'autres femmes ?
9. Est-ce que des jeunes femmes mariées, qui ont des enfants, ont assez de temps pour cultiver les champs elles-mêmes?
10. Est-ce que les femmes ont les mêmes matériels disponibles pour cultiver la terre comme leurs maries?
11. Est-ce que les terres données aux femmes sont loin ou proche de leurs maisons ?

<u>Des changements liés à l'accès à la terre et la production de pourghère</u>

8. Est-ce que la plantation de pourghère aboutit dans un extra demande pour la terre ?
9. Est-ce qu'il y a une autre culture de rente (par exemple le coton) qui a aboutit dans un extra demande pour la terre ? Si oui : laquelle/lesquelles ?
10. Est-ce que l'association de femmes s'intéresse à d'avantage de production de pourghère ?
11. Est-ce que les femmes sont intéressées aussi dans la production de pourghère avec leur ménage ou la famille (alors en dehors de l'association de femmes) ?
12. Est-ce qu'il y aura dans l'avenir plus de terre disponible pour l'association de femmes pour la production de pourghère?
13. Est-ce qu'il y a des ménages ou familles qui ont perdu de la terre à cause de la production de pourghère ?
    b. Si oui, qu'est-ce qu'il est passé ?
14. Est-ce qu'il y a des disputes liés à la terre à cause de la production de pourghère ?

- Si oui, quels problèmes se posent ?
    - Par exemple, les gens qui ont emprunté des terres voulaient y commencer la production de pourghère.
- S'il y a des disputes, comment est-ce qu'ils sont abordés et résolu ?

<u>L'influence du pourghère sur les moyens de vie :</u>
Depuis que l'association de femmes s'occupe de la production de pourghère a-t-elle changé son utilisation du sol, des mains d'œuvre et des intrants ?
L´influence sur le travail :

1. Est-ce que l'association de femmes gagne plus de l'argent avec la production de pourghère qu'avec ce qu'elle produisait avant ?
    - Qu'est-ce qu'elle gagne maintenant avec la production ?
2. Est-ce que le volume de travail a augmenté par rapport à ce que l'association de femmes produisait avant ?
    - Si oui : comment ?
3. Est-ce que vous utilisez des intrants pour le pourghère ?
    - Si oui : lequel / lesquels ?
        i. Engrais
        ii. Fumier
        iii. De l'eau
        iv. Pesticide
4. Si oui : est-ce que la production de pourghère a besoin plus des intrants que ce que l'association de femmes produisait avant ?
    - Si oui : comment ?

L´influence sur les moyens de vie :

10. Est-ce que l'association de femmes a récolté des grains de pourghère ?
    - Si oui : depuis quand ?
    - Si oui : est-ce que les grains étaient vendus à Mali Biocarburant et est-ce que les femmes ont reçu de l'argent ?
    - Si oui : combien pour un kilo de grains ?
11. Qui récolte les grains dans l'association de femmes?
    - Toutes les femmes qui font partie de l'association de femmes
    - Les femmes de certaines familles ou ménages
    - Les femmes vieilles
    - Les femmes jeunes
    - ….
12. Qui gagne de l'argent avec la production de pourghère?
    - Toutes les femmes qui font partie de l'association de femmes
    - Les femmes qui font le travail
    - ….
13. Qu'est-ce que l'association des femmes fait avec l'argent qu'elle a gagné avec la production de pourghère ?
    - Est-ce que l'argent est dépensé aux besoins communs ?
    - Est-ce que l'argent est divisé par les femmes ?
    - ….
14. Est-ce que le bien-être des femmes est amélioré à cause des revenues de la production de pourghère?
15. Est-ce que vous attendez une augmentation des revenues avec la production de pourghère dans les années suivantes ?
    - Si oui : est-ce que l'association de femmes veut augmenter ses investissements de la production de pourghère ?
        - Si oui : lesquels ?

16. Est-ce qu'il y a d'autres cultures de rente qui sont vendus pour l'argent ?
    a. Si oui : ce sont lesquels ?
    b. Si oui : qu'est-ce que les jeunes font avec l'argent ?
    c. Si oui : est-ce qu'il y a aussi des investissements communs fait avec l'argent qui était gagné avec les autres cultures de rente ?
17. Est-ce que la production de pourghère remplace/remplacerait d'autres culture de rente
    - Si oui : c'est pourquoi ?
    - Si oui : est-ce qu'on gagne plus avec la production de pourghère ?
18. Est-ce que la production de pourghère a stimulé des jeunes de rester au village pour gagner de l'argent avec la production de pourghère ?

Appendix 4 : Topic list for interview with the family or household

Caractéristiques personnelles:

1. Nom :
2. Appartient à une famille fondatrice / famille non fondatrice
3. Combien membres dans le ménage / la famille:
4. Quel group d'ethnie:
5. Genre: F / M
6. L'âge (à peu près):
7. Associé(e) avec : les jeunes / femmes / pas associé(e)

La situation actuelle par rapport à la terre de la famille

1. Combien d'hectare de terre est-ce la famille
    - cultive ?
    - a en jachère ?
    - utilise pour le pourghère ?
2. Combien de terre est-ce qu'il y a pour le ménage ?
3. Est-ce que la famille a demandé plus de terre au chef de village ou au(x) autre(s) chef(s) de familles pendant les dernières 10-15 ans?
    Oui : pourquoi ?
4. Est-ce que la terre pour la famille/ le ménage :
    - est une propriété privée
    - est donné pour un temps indéfini
    - est possédé temporellement (emprunt / pris en bail)
    - appartient au commun
    - ….
5. Qui de votre famille décide si vous pouvez produire le pourghère ?

La production de pourghère:

Caractéristiques du champ

1. Quelle est la distance entre votre maison et la terre où le pourghère est produit ? ... km
2. Le champ où le pourghère est produit a quel type du sol?
    - Sablonneuse
    - Argileuse
    - Côte
    - Bas-fond
    - ….
3. Quelle est la distance entre votre champ et votre accès à d'eau ? … mètres

Depuis la production de pourghère

1. Combien d'hectare est utilisé maintenant pour la production de pourghère ?
2. Combien de pieds de pourghère sont planté maintenant ?
3. Depuis quand est-ce vous avez commencé la production de pourghère ?
4. Combien d'hectare était utilisé pour la production de pourghère quand vous l'avez commencé?
5. Combien de pieds de pourghère étaient planté quand vous avez la production de pourghère?
6. Avant la production de pourghère sur le champ, qu'est-ce que vous avez fait avec le champ ?
    - Le champ était en jachère et appartenait à la famille / ménage
    - Le champ était terre en jachère et appartenait au village
    - Le champ était utilisé pour une autre culture de rente
    - Le champ était cultivé pour la consommation familiale
    - Le champ est terre marginale et n'était pas utilisé
    - …
7. Pourquoi vous choissiez d'utiliser cette terre pour le pourghère ?

8. Est-ce qu'il y a plus de personne de votre ménage / famille (par exemple des femmes/jeunes) qui s'intéresse à produire le pourghère ?
    - Si oui : est-ce que ça aboutit dans un extra demande pour la terre dans la famille ?

<u>Moyens de vie:</u>

Capital social

1. Est-ce que la pépinière était gardée :
    - individuellement
    - en coopération avec votre ménage / famille
    - en coopération avec les membres de village ?
2. Est-ce la production de pourghère est faite :
    - individuellement
    - en coopération avec votre ménage / famille
    - en coopération avec les membres de village ?

Capital physique

1. Quel(s) matériel(s) aviez vous disponible pour la pépinière ?
    - Un puit / pompe
    - Seau / arrosage
    - Engrais
    - Fumier
    - pesticide
    - …
2. Quel(s) matériel(s) avez vous disponible pour le champ où le pourghère est produit ?
    - Un puit / pompe
    - Seau / arrosage
    - Charrue / Charrette
    - Engrais
    - Fumier
    - Pesticide
    - …
3. Est-ce que vous manquez des matériels pour la production de pourghère ?

L'amélioration de moyen de vie

1. Est-ce que le volume de travail a augmenté par rapport à ce que vous avez produit avant le pourghère ?
2. Est-ce que vous avez récolté des grains de pourghère déjà?
    - Si oui : combien de kilo's ?
3. Est-ce que vous avez vendu les grains ?
    - Si oui : qui de votre famille / ménage gagne de l'argent?
        - Est-ce que l'argent est partagé ? Si oui : parmi qui ?

(L'avenir)

1. Est-ce que vous vous attendez à une augmentation des revenues de pourghère ?
2. Est-ce que vous voulez produire plus d'hectare avec le pourghère ?
    - Si oui : est-ce que votre famille / ménage a encore assez de terre disponible pour la production ?
        - Si non : est-ce que vous voulez demander au chef de village pour obtenir plus de terre pour la production de pourghère ?

<u>Des remarques/observations :</u>

Appendix 5: Lists of people interviewed per village

People interviewed in Feya

1. Village chief
2. President of women's association 1
3. President of women's association 2
4. Female villager 1
5. Female villager 2
6. Female villager 3
7. Female villager 4
8. Male villager 1
9. Male villager 2
10. Male villager 3
11. Male villager 4
12. Male villager 5
13. Male villager 6

People interviewed in Dontieribougou

14. Village chief
15. President of women's association
16. Representative of men's association
17. Male villager 1
18. Male villager 2
19. Male villager 3
20. Male villager 4
21. Male villager 5
22. Male villager 6
23. Male villager 7
24. Male villager 8

People interviewed in N'Piébougou

25. Village chief
26. President of women's association 1
27. President of women's association 2
28. President of men's association
29. Male villager 1
30. Male villager 2
31. Male villager 3
32. Male villager 4
33. Male villager 5
34. Male villager 6
35. Female villager 1
36. Female villager 2

People interviewed in Ouroungo

37. Village chief
38. President of men organisation
39. Male villager 1
40. Male villager 2
41. Male villager 3
42. Male villager 4
43. Male villager 5
44. Male villager 6
45. Male villager 7

People interviewed in M'Pana

46. Village chief
47. Vice-President of women's association
48. Vice-President of men's association
49. Male villager 1
50. Male villager 2
51. Male villager 3
52. Male villager 4
53. Male villager 5
54. Male villager 6
55. Male villager 7
56. Male villager 8

People interviewed in Ferekoroba

57. Village chief
58. Vice-President of women's association
59. President of men's association
60. Male villager 1
61. Male villager 2
62. Male villager 3
63 Male villager 4
64. Male villager 5
65. Male villager 6
66. Male villager 7

People interviewed in Kenenkoun

1. Village chief
2. President of women's association
3. Female villager 1
4. Male villager 1
5. Male villager 2
6. Male villager 3

Appendix 6 : Interview questions prepared for the 9 key people

Person	Working for	Position
Monsieur Touré	Bureau des domaines et des affaires foncières	Head of the Bureau
Monsieur Kamara	Town hall of Ouelessebougou	Deputy Mayor
Monsieur Talet	Prefecture of Ouelessebougou	Sub-prefect
Monsieur Cissé	-	Entrepreneur in car tyres
Dr. Djiré	University of Bamako	Researcher on land management, access to land and land conflicts in Mali
Monsieur Sissoko **Monsieur Coulibaly**	Ministère du Logement, des Affaires foncières et de l'Urbanisme	Conseiller Technique Architecte Inspecteur en chef des domaines et des affaires fonciers
Monsieur Hantafaye	L'Agence Nationale de Développement des Biocarburants	Director-General of ANADEB
Monsieur Samaké	Programme National de Valorisation Energétique de la Plante Pourghère	Head of PNVEP

1. Monsieur Touré, Head of the Bureau des domaines et des affaires foncières

Questions prepared for the interview on September 4, 2009.

<u>La première partie :</u>

1. Est-ce que les procédures pour obtenir un titre foncier sont écrites et consultables ?
2. Est-ce que c'est correct que le chef de village et ses conseillers doivent signer une déclaration qui atteste l'abandon des droits coutumiers de la collectivité ?
    - Sont les droits coutumiers et les autoritées coutumières reconnus ?
    - Est-ce que les autorités coutumières peuvent désapprouver une concession rurale ?
3. Après la concession rurale, comment est-ce qu'on peut obtenir un titre foncier ?
4. Est-ce que la concession rurale donne des sécurités ? (« la concession rurale est un droit tout aussi précaire que leurs droits coutumiers », Djiré, p.12-13).
5. Qui s'intéressent à obtenir des titres fonciers ?
6. Qu'est-ce que ça veut dire 'commodo et incommodo' ?

<u>La deuxième partie :</u>

1. Quelles sont les conditions importantes pour que la législation foncière soit bien appliquée ? (les textes coloniaux conservés, le Code Domanial et Foncier de 1986 et 2000 qui aussi reconnaît une valeur juridique aux droits coutumiers).
2. Comment est-ce que la législation foncière aide les villageois à garantir/sécuriser leurs droits (coutumières) pour des terres ?
3. Quel est le rôle de la décentralisation pour améliorer le lien entre la législation foncière nationale et le niveau local qui gère la terre traditionnellement ?
4. Est-ce que la décentralisation doit renforcer les capacités des gens pour améliorer le lien entre les deux niveaux ?
    - Quelles capacités ?

5. Selon vous, est-ce qu'il y a des limites pour obtenir un titre foncier ? (Par exemple, un manque de connaissance avec les lois des droits fonciers, l'argent, la lourdeur administrative).
6. D'un point de vue culturel, la terre n'est pas une propriété personnelle et c'est pourquoi les villageois n'acceptent pas d'être payés pour la terre. Est-ce que cette particularité culturelle est encore acceptée avec la législation foncière ?
7. J'avais entendu qu'il y a beaucoup de doubles ou multiples réclamations sur la propriété des terres. Est-ce que c'est vrai ? Si oui, y a-t-il des failles dans la législation foncière ? Est-ce qu'il y a des procédures pour éviter des multiples réclamations ?
8. Avec la publicité dans la section de 'Commodo Incommodo' dans l'Essor, voici une manière de faciliter l'accès à l'information en ce qui concerne l'immatriculation des terres. Mais il reste une barrière des langues, parce que en général les villageois ne lissent pas le français et n'ont plus accès à l'Essor. Est-ce que le gouvernement et/ou le processus décentralisé a la volonté d'améliorer cet accessibilité ?
9. Est-ce que la législation foncière essaye d'éviter la spéculation fonciere ? Et comment ? Si non, est-ce que la législation foncière sera améliorée sur ce point là ? Comme c'est dit à l'article 77 de LO : « La politique foncière Agricole vise à lutter contre les spéculations en matière de transactions, de tenures foncières et de détentions coutumières abusives des espaces. Elle repose sur l'institution du cadastre au niveau de chaque commune afin de préciser toutes les indications relatives aux terre Agricoles »
10. Comment est-ce que la législation foncière peut devenir légitime, si les villageois ne la connaissent pas et ne l'accepte pas ?

11. Est-ce que la législation foncière n'est finalement pas efficace que pour les villes et les endroits périurbains ? Alors, est-ce que la législation doit être appliquée pour les villages ? (Un villageois de Kenenkoun disait : « les titres fonciers révolte les esprits des villageois »).
12. LOA reconnaît qu'il y a des groups minoritaires et veut « sécuriser l'exploitation par un accès équitable », surtout pour les jeunes et les femmes. « L'Etat privilégie l'installation des jeunes, des femmes et des groupes vulnérables comme exploitants Agricoles, notamment en favorisant leur accès aux facteurs de production et par des mécanismes d'appuis techniques ou financiers particuliers ».

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2 and 3. Monsieur Kamara, Deputy Mayor of Ouelessebougou and Monsieur Talet, the sub-prefect of Ouelessebougou

Questions prepared for the interview on October 2, 2009.

1. Qu'est-ce que vous pensez de la production de pourghère pour les biocarburants dans la commune d'Ouelessebougou ?
2. Est-ce que la terre est souvent volée parmi des villages/familles ?
3. Les familles non-fondatrices qui ne sont pas données de terre, mais qui l'empruntent, comment est-ce qu'elles peuvent :
    a. produire le pourghère ?
    b. garantir/sécuriser leur accès à la terre ?
4. Est-ce que vous pensez que les titres provisoire/fonciers peuvent :
    a. éviter que la terre est volée par des villages/familles
    b. sécuriser l'accès à la terre pour les familles non-fondatrices?
5. Si oui : est-ce que vous pensez que les facteurs suivants empêchent les gens d'obtenir de titres provisoires/fonciers ? (la langue français (commodo et incommodo, bureau administratif, langue écrit, les payement, inconnue avec les institutions administratif).

6. Comment est-ce que la mairie/le sous-préfet d'Ouelessebougou essaye d'améliorer les possibilités pour les gens d'avoir un meilleur accès à obtenir un titre ?

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4. Monsieur Cissé, entrepreneur et producteur de pourghère

Questions prepared for interview on October 12, 2009.

Des questions en général :

1. Quelle est votre profession ?
2. Où est-ce que vous avez la parcelle de 50 hectares ?
3. Est-ce que c'est une grande parcelle ou des petits parcelle qui font ensemble 50 hectares ?
4. Depuis quand est-ce que vous avez cette parcelle ?
5. Pourquoi est-ce que vous avez 50 hectares ? Qu'est-ce que vous voulez faire avec les 50 hectares ?
6. Comment est-ce que vous avez obtenu la terre ?

Des questions par rapport à l'obtenir la parcelle :

1. Comment vous êtes attribué la terre ?
   - L'attribution villageoise : héritée, don, achat ;
   - L'attribution de concession rurale par l'Etat) ;
   - …
2. Est-ce que vous avez un titre provisoire ou un titre foncier pour les 50 hectares ?
3. Quelles sont les procédures pour obtenir un titre provisoire/foncier ?
   - Sous préfet / préfet / gouvernorat ?
   - Titre provisoire : 10.000 CFA / ha/ an ; 50 hectares pour 5 an = 2.500.000 CFA
4. Comment c'est passé avec le chef de village, le propriétaire terrain et la population rurale ?
   - donné le kola ?
   - demandé permission au chef de village / le P.T.
   - les relations entre le niveau administratif et le village
5. Est-ce qu'il y avait des personnes qui étaient contre votre titre provisoire/foncier ?
6. Selon vous, quels sont les avantages de titre foncier par rapport au droit coutumier ?

Des questions par rapport à la production de pourghère :

1. Pourquoi vous vous intéressez à produire le pourghère ? Vous avez combien d'hectare de pourghère ?
2. Est-ce que vous allez augmenter votre production de pourghère ?
3. Est-ce que vous avez des moyens pour cultiver la terre (comme tracteur) ?
4. Est-ce que c'est vous qui travaillez au champ ?
5. Est-ce que vous connaissez des autres personnes avec une parcelle d'une telle taille avec un titre provisoire/foncier?

Remarques :

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5. Monsieur Djiré, researcher at the University of Bamako
Questions prepared for interview on October 14, 2009.

Introduction de ma recherche :
Il y a des grandes différences entre des villages par rapport à l'accès à la terre et la production de Pourghere pour des femmes/hommes ; des familles fondatrices/Familles non-fondatrices ; et parfois entre le propriétaire terrain et le chef de village.
Il y a aussi des opinions différentes par rapport aux titres foncières, mais au niveau de village ils sont plutôt contre. Néanmois,

- les familles non-fondatrices de Ferekoroba s'intéressent à les'obtenir comme ils sont traités inégales.
- Un commerçant que j'avais parlé veut obtenir plus de terre avant qu'il demande une titre provisoire (concession rurale).

Vous avez dit : « Les nouveaux textes, toutes en reconnaissant une valeur juridique aux droits coutumiers, font au titre foncier l'unique preuve du droit de propriété foncière et de l'immatriculation » (Djiré, 2007, p.2).

1. Quelle valeur juridique ?
2. Si le chef de village et ces conseillers sont, en général, contre des titres dans leur village est-ce qu'ils ont toujours le pouvoir pour bloquer le processus de immatriculation d'un parcelle dans leur village ? (un villageois de Kenenkoun disait « les titres foncières révoltent l'esprit des villageois »)
3. Est-ce que vous avez entendu de la conférence en Décembre du Ministre de l'Urbanisme, sur les enjeux des titres foncières et des droits coutumiers ?
4. Est-ce que vous avez entendu de Programme National de la Valorisation Energétique de la Plante Pourghère ?

Quel est votre opinionpar rapport:

1. Aux limitations à obtenir/éviter une titre provisoire/foncière : la langue français, les moyens, inconnu avec les institutions et les procédures. Est-ce que le gouvernement doit faire quelque chose contre ces limitations ?
2. Aux titres fonciers dans les zones ruraux/périurbain ?
3. A l'immatriculation; est-elle un développement désiré ?

Remarques :

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6 and 7. Monsieur Sissoko and Monsieur Coulibaly, the Ministère du Logement, des Affaires foncières et de l'Urbanisme
Questions prepared for interview on October 19, 2009.

Moussa Sissoko : Conseiller Technique Architecte
Amadou Coulibaly : Inspecteur en chef des domaines et des affaires fonciers

1. Quel est le but de la conférence qui aura lieu en Novembre ?
2. Quels sont les problèmes ruraux les plus importants qui seront adressés pendant la conférence ?
3. Quels sont les enjeux les plus grands avec la co-existence de la législation et droits coutumiers ?
4. LOA propose que la position des jeunes, femmes, par rapport à leur accès à la terre et aux facteurs de production soit améliorée ; mais comment le faire ? (art.10, 24, 45, 83 / 76).

5. Est-ce que la production de biocarburants est un thème relevant dans la discussion de titres fonciers (production locale – production industrielle) ?

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8. Monsieur Hantafaye, Director-General of the ANADEB

Questions prepared for the interview on October 23, 2009.

Préparation:

21.5.2009 : ratifié l'ordonnance du 4.3.2009 creation ANADEB autonomie énergetique, 2 filières prioritaires : pourghère (12.5 million litres) et ethanol (25 million litres)

- normes en matière des biocarburants et le mis en oeuvre
- fixe structure de prix des biocarburants
- assurer la concertation entre les partenariats nationaux et internationaux
- permanente disponibilité des biocarburants sur les marchés.

1. Est-ce qu'ANADEB se concentre sur la production industriel ou production locale avec le pourghère ?
2. Quels sont les avantages de la production industrielle par rapport à la production locale et vice versa ?
3. Est-ce que ANADEB s'occupe avec la création des normes en matières de biocarburant la gestion de terre ?
4. Quelle est la vision d'ANADEB par rapport à la position des femmes/groups vulnérables ?
5. Selon vous, quel est l'avenir de la production de biocarburant au Mali ?

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9. Monsieur Samaké, Head of PNVEP

Questions prepared for the interview on October 26, 2009.

PNVEP :	Programma National de Vulgarisation Enérgetique de la Plante de Pourghère
Organisation :	Direction National de l'Energie
	Ministère des Mines de l'Energie et de l'Eau.
Zones d'intervention :	Régions de Kayes, Koulikoro, Sikasso, Ségou et Mopti
Date :	2004-2008 : projet pilote

Objectifs spécifiques :

- L'accroissement de la production de pourghère
- L'éléctrification de 5 villages par des groupes éléctrogène fonctionnant à l'huile de pourghère.
- La conversion et l'utilisation de l'huile de pourghère
- La signifcation de contribution de pourghère pour la lutte de pauvrété .

1. Comment le projet pilote a développé les dernières 4 ans ? Et qu'est-ce qu'il va venir dans les années prochaines ?
2. Qu'est-ce que vous pensez du rôle de MBSA ? (pour une marché nationale).
3. « Les femmes en milieu rurale constituent le principal group cible du programme »
    a. Pourquoi les femmes ?
    b. 2) comment ?

4. Est-ce que vous pensez qu'une intervention comme la production de pourghère en milieu rurale est une avantage aux femmes (ou autres groupes vulnérables) et leur accès à la terre ?
5. Est-ce que le PNVEP s'occupe/s'occupait avec les questions de terres en milieu rurale ?
6. Selon vous, quel est l'avenir de la production de pourghère pour les biocarburant au Mali ? (comme c'est un projet pilot, quoi à faire après ?)

Appendix 7: Description of land pressure per village

The description per village below accompanies Table 3 'Land pressures in the villages'.

Feya

Feya is a relatively large village with 125 families and over 900 residents. The founding family is a Bambara family named Coulibaly. The Diarra, Traoré, Forgeron[25] and two Peul families joined the founding families later. The Coulibaly family distributed land to the later families, and the amount of land given was usually enough for family food production. When families want to obtain more access to land, they ask the village chief for more land; which can be either given or lent to them.

During the drought of 1972 – 1978, the number of residents in the village increased in because more families settled in Feya. This increase slowly continues with one or two new families joining the village every year. Families rarely leave Feya and a rural exodus does not occur because there is enough fertile land available. Therefore, and because of many new births, the village population has grown strongly over time.

Traditionally, the village had five clearly divided neighbourhoods which were each started by a separate family. Each neighbourhoods used to have collective fields in which families living in that neighbourhood worked together. However, due to the increasing population, collective work was not always continued. This is because there are too many people to work on the relatively small plot of land that was reserved for collective work. Nowadays, most land is cultivated primarily by the extended family or the household. Yet, in one neighbourhood a men's association is involved with cotton production and women's associations cultivate gardens in different neighbourhoods.

On the west side of the village, there are hills that are not very arable, so they are used as pasture land to breed cattle. This also prevents the animals from eating the food that is produced elsewhere in the village. On the northern side, there is fertile soil that is used for fairly intensive cereal production. Traditionally, people used to live and cultivate in hamlets only during the rainy season. However, as time went on, more families wished to settle in the village, and the village chief gave the hamlet lands to the new families that can live there all year. New families that wish to settle in the village will be given land that is further away from where the village chief lives, the 'Sola'[26] neighbourhood. This is because there is still a lot of unused arable village land available, especially in the direction to Koulikoro where the village has a lot of forests and where land use can easily be extended.

Since 2007, when the factory of Mali Biocarburant SA was constructed and a field employee came to Feya, more and more villagers have become interested in growing Jatropha for the production of bio fuels. Some villagers already knew Jatropha because it was used as a living fence against grazing animals and female villagers produced soap from the Jatropha nuts.

More and more people, especially from Bamako and Koulikoro, would like to obtain land in Feya. The village chief is reluctant to give land to people from the city because their interest in obtaining

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[25] 'Forgeron', or Blacksmith, is neither a family name nor a distinct ethnic group. The name refers to the work done by the family, forging metals into objects. This distinguishes this family from the others living in the village. In this case, the Forgeron family belongs to the Bambara ethnic group.

[26] 'Sila' is Bambara for the 'main house' ('maison principale'), hereby referring to the area where the first people settled and from whom the village chief descends.

land might be related to land titles. Therefore, families that wish to settle are given land and must build a house. The village finds this an important condition before giving land to an 'outsider'. This is because the construction of a house signifies that the family is making an investment to come to live in the village (Male villager 1, Feya). For three years now, the village has been involved in a land problem that involves another village. The son of the village chief of the neighbouring village Tanabagougou stole eighteen hectares from Feya and sold it to businessmen from Bamako and Koulikoro. The villagers want to reclaim this land, and try to do so by collecting money during village meetings to start a judicial process. The village does not permit land being sold or mortgaged; the overall idea is that these practices take place in the cities and should not occur in rural Mali.

Dontieribougou

Thirty-four families live in Dontieribougou with an estimated number of about 680 people[27]. Coulibaly is the founding family and the Traoré and Konaté families joined the village later. The Konaté families belongs to the Malinké ethnic group; all the other families are Bambara. Since 1973, only two new families have moved to Dontieribougou. During the past fifteen years, the number of residents has remained constant but a rural exodus has taken place. Young villagers leave Dontieribougou for temporary work but also stay away for longer periods. The girls find work in Bamako and the boys go to Bamako or abroad, to destinations such as Congo, Gabon and the Ivory Coast.

The village has enough land available and each family has been given sufficient land. The village chief does not expect a demand for land for the extension of bio fuel production, because the families were given enough land to be able to extend Jatropha production. "User rights are inherited and every family has enough land, therefore it is rare that families need to borrow land from each other" (Village chief of Dontieribougou). In fact, each family has enough land to rotate its fields so that fields are left fallow every few years.

Because there is enough land for everyone, there are no real land pressures or conflicts in the village. Nonetheless, the number of hectares cultivated has increased over the past ten to fifteen years at the expense of pasture lands. The village has no forests or collective fallow land and there are no marginal lands that are left untouched. There is a hamlet where one family lives and where a few families work during the rainy season. One person from the nearby town of Sirakorola received permission from the village chief to work there on a plot of land as long as he does not plant any trees.

There is only one collective field, which is cultivated by the men of all 34 families. Jatropha production was started in 2008 and, because of the motivated leader of the men's association, Jatropha production started well. However, the leader died and since his death, the village council has not yet found a suitable successor (with personal characteristics such as honesty, seriousness and courage). The village chief says that this can be partly attributed to the fact that young men are on rural exodus. Because of a lack of leadership, the collective field is not well maintained and this has

[27] The village chief had no information on the population. Therefore, the population is estimated as follows. The number of families living in the village times 20 (which is an assumed average number of members per family).

affected the Jatropha production. However, Jatropha was planted by direct seeding[28] and, because of a lack of water in the village, many plants have died. Before Jatropha production was introduced, the village was engaged in growing cotton. However, because cotton production demands a rich soil and fertilisers and pesticides are too expensive, villagers have stopped the production.

The village is against formal land tenure because it is aware that if people gain formal land titles, the family with user and heritage rights will no longer be able to claim them if this land is sold. Thus, to prevent problems, land cannot be sold.

The lack of water is an ominous problem. The village digs wells but most of them collect insufficient amounts of water because of the relatively dry rainy seasons and some wells have collapsed. This water problem significantly affects food and Jatropha production; the villagers have already replaced many of their Jatropha plants from previous years.

N'Piébougou

N'Piébougou was founded by the Coulibaly family and is relatively small, consisting of only fifteen families and about 300 residents[29]. The Kamara, Dansoko, Diallo, Silla and Traoré families joined the founding family over time and all these families have lived there for at least forty years. The village chief[30] believes that the village land no longer belongs to him and his family because it was given to the other families a long time ago. Like the village chief and his family, most families are Bambara; a few others belong to the Sarakolé and Peul ethnic groups. Since the two droughts of 1973-1977 and 1983-1988, four families have left the village and no new families have arrived. In the past, N'Piébougou saw a lot of its young men leaving to earn money elsewhere. Nowadays, girls also leave the village to search for paid work. Around ninety percent of the young men that leave the village return to marry and start a family in N'Piébougou. Despite the rural exodus, the population has increased because there are many new births.

In the past, villagers used to be more involved in collective food production. This was because there was more rain fall, there were fewer people and they had good harvests. Nowadays, the conditions are different. There is not enough rain, the soil is less fertile and people are drawn towards earning money" (Village chief of N'Piébougou). The interest in working collectively dropped because of these factors and this explains why there are no collective fields with food production

Nevertheless, as a result of interventions by NGOs, the Sub-prefect of Sirakorola[31] and the work done by MBSA's field staff, a women's association has been set up. In the past, there was a women association that cultivated land, but it stopped because of the severe periods of drought and a lack of access to water. The current women's association is involved in (and is paid for) helping families with harvesting their cotton and food production. In 2009, the women's association did not cultivate

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[28] In contrast to a nursery (from which young Jatropha plants are transplanted to the field), direct seeding takes place in the field where the Jatropha trees are to stay.

[29] The village chief had no information on the population. Therefore, the population is estimated as follows. The number of families living in the village times 20 (which is an assumed average number of members per family).

[30] In this case, the village chief is also the 'land owner'.

[31] A Sub-prefect is seated in the Sirakorola Commune. Amongst other things, this administrative body is responsible for carrying out policies that were advanced at the national level.

anything on the one hectare that it was given by the village chief. This was because the rainy season started late and the women needed to help their families with the food production. For 2010, however, the women's association is interested in starting one hectare with Jatropha production. Thus, despite the different reasons why villagers are no longer involved in collective food production, a group of women is associated and is interested in Jatropha production. The village chief and council are happy with this, because they perceive associations to be good and important for the collective village spirit.

The land reserved for pastures is considered marginal as it is gravel and therefore useless for food production. Together with a neighbouring village, N'Piébougou shares a forest for which some intra-village user rules are set up. There are no hamlets and no unused arable village lands available anymore because the village chief has given all the land away to the families.

Working on the land is becoming increasingly difficult for the villagers. The soil is no longer fertile and they therefore either need to use fertilisers or to clear land. However, because there is no more unused arable land available, clearing land is not an option. Furthermore, the villagers do not have the money to buy fertilisers and, because the fertility of the lands they cultivate cannot be improved, intensive land use will become difficult. In the long run, this is expected to endanger family food production, but the village has no strategy to overcome this problem. It was said that there are no land conflicts. However, under these conditions (no unused arable land available, less fertile soil and more intensive land use), it is possible that land conflicts will arise at some time. Up till now, however, the village chief indicates that the declining quality of land has not led to a demand for more land amongst villagers. The villagers know they will be unable to obtain more land through him and they are aware that solutions should be looked for with other families. For example, families could lend land to each other to secure a family's food production.

In 2007, with the presence of a field employee, Jatropha production started in N'Piébougou; which is usually undertaken in close co-operation with the family. If families wish to augment the number of hectares cultivated with Jatropha, they will need to use the land already given to them by the village chief, because there is no more unused arable land available. This also implies that the village chief can no longer provide land to a family that wishes to settle in the village. A new family can only settle in N'Piébougou if another family has sufficient land to lend or to give to the new family.

Partly because of the above-mentioned problems with land and land management, the village chief is against formal land titles. The land "does not suffice them" (Village chief of N'Piébougou) and the village chief and the villagers believe that individual land titles would not improve the village's land management. In fact, without individual land titles, villagers are inclined to look for solutions for land problems among themselves and, if conflicts arise, they will be resolved amicably with the intervention of the village chief, if required. In contrast, if people own formal land titles and land problems occur, such problems are not resolved in a similar fashion but at the administrative level.

Ouroungo

The village of Ouroungo has thirty-one families and about 620 inhabitants[32]. The Traoré is the founding family of Ouroungo and is Bambara. Other later families are the Sangaré and the Diarra. The majority of the villagers is Bambara, and a minority ethnic group living in Ouroungo is Peul. Since the drought of 1973-1978, no new families have joined the village.

The population has strongly increased as a result of new births. Yet, at the same time, a rural exodus is taking place which is characterised by girls leaving the village temporarily and returning for the rainy season to help their families. The boys often leave the village for a longer time and return to marry and start a family. During the past twenty years, there has been a growing demand for land in Ouroungo, which can be attributed to the strong increase in population. If families that already live in Ouroungo wish to obtain more land, this is possible because there is still some unused arable land available. Although no new families have wished to settle in the village, the village chief of Ouroungo admits that he would hesitate to give them land. This is because their motives can be unclear and a new family might want to obtain a formal land title in the future, whereas the village is against formal land titles and financial transactions for land.

The village has no forests, which implies that charcoal is bought from another village. There is no collective fallow land, neither hamlets nor communal pasture lands. In fact, the families themselves take care of pasture lands as they keep the livestock for milk production. Since fertilisers are too expensive, villagers depend on organic fertilisers from their own animals. The villagers are not involved in communal work because the work is done by the extended family.

At the moment, there are no land problems in the village yet. However, because the village is surrounded by other villages there is no space to extend the village territory, which might cause problems in the future. Because the village population has increased strongly and is expected to increase, villagers need to manage the land better. One option is to intensify land use, which in fact already occurs. In the past, a family used to be able to leave its land fallow after fifteen years of use and continue cultivating a new plot. Nowadays, however, people are forced to continue cultivating their lands because there is no other arable land available. The fields are not left fallow and there is no regeneration through a rotation system. Thus the village needs (or will need) fertilisers to improve the soil's fertility.

In the past, the villagers were involved in cotton production. However, because they experienced difficulties with the Malian cotton textile company (Compagnie Malienne du Développement des Textiles, CMDT), most villagers stopped producing it. The problems with the CMDT arose when villagers were asked how many bags of fertiliser they needed for their cotton production. Instead of being given what they asked for, the villagers were given fewer bags. And, despite this, they were charged for the number of bags they asked for. This put the villagers in debt (Male villager 1 in Ouroungo).

Because the villagers experienced difficulties with the CMDT, they are afraid that Jatropha production for Mali Biocarburant SA will bring similar problems. Jatropha production started in 2007 and is usually undertaken by families and sometimes by individuals. The men's association has postponed Jatropha production on one hectare to 2010. This was because the rainy season started

[32] The village chief had no information on the population. Therefore, the population is estimated as follows. The number of families living in the village times 20 (which is an assumed average number of members per family).

late in 2009 and the men were too occupied with family food production to start with the association's Jatropha production.

The two villages described below are located in the production zone Ouelessebougou; in the direction of Sikasso, which is known for cotton production. In the two villages below, cotton is still grown and Jatropha production for Mali Biocarburant was started in 2009.

M'Pana

M'Pana is a small village with about fifteen families and a total of 300 people. The founding family Samaké and the Diarra (both Bambara), Diallo and Ba families (both Peul) settled in M'Pana later. The Samaké families are the 'land owners' and all the other families borrow land from them. Over time, the population in M'Pana has stayed the same. The village deals with a rural exodus but the youth returns for the rainy season to help their families.

There are pasture lands, forests and marginal land, and the number of hectares of these different types of land has not changed during the past ten to fifteen years. There is enough arable land available in the village and this can be obtained if the village chief is asked.

Unlike the four villages described above, the later families in M'Pana were not given any land when they started living there. Instead, the founding family lent them enough land for the family's food production[33]. Table 3 indicates that there are no land conflicts. However, if the position of later families is considered, it is possible that land conflicts will occur in the future; for more detail, see section 4.4.

Most villagers of M'Pana are engaged in cotton production. They buy a lot of fertilisers from the CMDT and they are thus able to cultivate their land fairly intensively. As in Ouroungo, the CMDT causes some problems in M'Pana. The cotton textile company takes a long time to pay the villagers for their cotton production. To prevent the financial problems that this causes, the men's association pays these farmers an advance. Often, the men's association is reimbursed by CMDT six to nine months later. The men's association is thus very important for the villagers. M'Pana hopes that MBSA will not treat the Jatropha producers similarly.

Jatropha production took off in M'Pana in 2009, under the supervision and with the help of field employees of Mali Biocarburant who started working in the zone of Ouelessebougou. Depending on how well Jatropha will do, the village chief expects a demand for land for the production of Jatropha in the future.

[33] The village chief indicated that there is a clear distinction between the founding families and the families that joined the village later, and for that reason my translator felt he could not ask all the questions I wanted to ask. Therefore, I cannot be very specific about access to land and land titles. However, it can be expected that the village chief is not in favour of land titles in his village, considering how he talks about families that have settled later that borrow land from him and considering his position as the village chief and the 'land owner'. It is not likely that he is willing to give up the land that belongs to him and his family.

Ferekoroba

Ferekoroba is a large village with fifty families and over 1000 inhabitants. The majority of the inhabitants are Bambara and the minority are Peul. The Bambara village founders are Samaké and Traoré. The later families were Sanago, Camara, Koné and Doumbia. Most of the families haved lived there for many generations. However, since the droughts of 1973-1977 and 1983-1988, a few families have settled in the village. The later families have less land available than the families who founded Ferekoroba. As in M'Pana, later families are not given land but lent land.

During the course of time, the number of hectares of cultivated land has increased at the expense of pasture land. Recently, a women's association started growing rice on a plot of marginal land. There are two hamlets on the village grounds, one in which only people from Ferekoroba live and one in which residents from both Ferekoroba and another village live. Ferekoroba and its neighbouring villages have a lack of land and this explains their very intensive land use. The villages have no more unused arable land available, but there is a demand for land. The shortage of land has resulted in that Ferekoroba borrows land from the neighbouring villages of Samogo and Sonsokoro. At the same time, Ferekoroba also lends land to the village of Zambougou, which has similar problems. The villages that borrow land from each other borrow it for an undefined period of time[34]. The land pressures on Ferekoroba can be explained by the close proximity of surrounding villages (which limits the village to expand its territory, and by an increasing population, with a few families that have settled during the drought periods and with the increase in new births.

Ferekoroba is relatively large and is made up of five neighbourhoods. Each of these neighbourhoods has a men's association; of which some produce cotton. Because there is a shortage of land, the men's association was unable to gain more land. This subsequently affected the women's association because the village chief decided to give land from the women's association to the men's association. This re-allocation severely limits the women association's access to land. Apart from borrowing land from a neighbouring village, Ferekoroba could gain access to land if families would decide to give up some of their land. If this would happen, this could benefit the men's and women's association. However, the village chief does not think that there are families interested in giving up their land.

Jatropha production recently started in Ferekoroba and it became clear that those who borrow land are also interested in Jatropha production. An inhabitant of Zambougou started Jatropha production on land that is borrowed from Ferekoroba. The inhabitant had not asked permission for this. Ferekoroba considered this to be a problem and, to prevent any further and future conflicts with Jatropha production on borrowed land, Ferekoroba demonstrated its disagreement by cutting down the small-scale Jatropha production of this person. It is possible that more of such problems might occur in Ferekoroba as a result of the wish to start and/or extend Jatropha production and the existing land scarcity.

[34] Thus, as long as the borrowed land is cultivated, the land will not be claimed back by the village that owns it. However, as soon as the land is left fallow, the village will claim it back.

Appendix 8: Avis d'Enquête de Commodo et Incommodo

Avis-Annonces

AVIS D'ENQUETE DE COMMODO ET INCOMMODO

CERCLE DE KITA

Le Prefet du cercle de Kita,informe la population du village de Manako, commune de Kita-Nord, cercle de Kita, qu'il est saisi de la demande de concession rurale suivante:
Nom et adresse du demandeur: Bamba Tounkara, commerçant à Bamako.
Objet:Plantation d'arbres fruitiers-Elevage- Cultures Vivrières-Construction de maison à usaage d'habitation :
Situation du terrain : au nord par Moussa Tounkara, au sud par Mamadou Tounkara, au sud par Mamadou Tounkara, au nord-est par la famille Konaté, à l'est par la famille Coulibaly, à l'ouest par la route Kita-Manako
Superficie du terrain : 05 ha 00 a 00 ca
L'enquête reglementaire sera effectuée sur le terrain,objet de la demande de concession rurale le 22 octobre 2009 à partir de 9 heures 30 minutes.
Les collectivités voisines et notamment celles qui seraient éventuellement titulaires du droit d'usage sur le terrain sont invitées d' y envoyer leurs représentants.

Le Prefet du cercle de Kita,informe la population du village de Manako, commune de Kita-Nord, cercle de Kita, qu'il est saisi de la demande de concession rurale suivante:
Nom et adresse du demandeur: Bamba Tounkara, commerçant à Bamako.
Objet:Plantation d'arbres fruitiers-Elevage- Cultures Vivrières-Construction de maison à usaage d'habitation :
Situation du terrain : au nord par Mady Baba Tounkara, au sud par la famille Konaté, à l'est par la famille Konaté, à l'ouest par la route Kita-Manako
Superficie du terrain : 04 ha 00 a 00 ca
L'enquête reglementaire sera effectuée sur le terrain,objet de la demande de concession rurale le 22 octobre 2009 à partir de 9 heures 30 minutes.
Les collectivités voisines et notamment celles qui seraient éventuellement titulaires du droit d'usage sur le terrain sont invitées d' y envoyer leurs représentants.

Le Prefet du cercle de Kita,informe la population du village de Manako, commune de Kita-Nord, cercle de Kita, qu'il est saisi de la demande de concession rurale suivante:
Nom et adresse du demandeur: Mady Baba Tounkara, commerçant détaillant à Bamako.
Objet:Plantation d'arbres fruitiers-Elevage- Cultures Vivrières-Construction de maison à usaage d'habitation :
Situation du terrain : au nord par la famille Konaté, au sud par Bamba Tounkara à l'est par la famille Konaté, à l'ouest par la route Kita-Masiako
Superficie du terrain : 03 ha 00 a 00 ca
L'enquête reglementaire sera effectuée sur le terrain,objet de la demande de concession rurale le 22 octobre 2009 à partir de 9 heures 30 minutes.
Les collectivités voisines et notamment celles qui seraient éventuellement titulaires du droit d'usage sur le terrain sont invitées d' y envoyer leurs représentants.

Le Prefet du cercle de Kita,informe la population du village de Manako, commune de Kita-Nord, cercle de Kita, qu'il est saisi de la demande de concession rurale suivante:
Nom et adresse du demandeur: Moussa Tounkara, directeur de société à Lybréville-Gabon.
Objet:Plantation d'arbres fruitiers-Elevage- Cultures Vivrieres-Construction de maison à usaage d'habitation :
Situation du terrain : au nord par Bamba Tounkara, au sud par Bamba Tounkara, à l'ouest par la route Kita-Masiako, à l'est par la famille Konaté
Superficie du terrain : 05 ha 00 a 00 ca
L'enquête reglementaire sera effectuée sur le terrain,objet de la demande de concession rurale le 22 octobre 2009 à partir de 9 heures 30 minutes.
Les collectivités voisines et notamment celles qui seraient éventuellement titulaires du droit d'usage sur le terrain sont invitées d' y envoyer leurs représentants.

Le Prefet du cercle de Kita,informe la population du village de Manako, commune de Kita-Nord, cercle de Kita, qu'il est saisi de la demande de concession rurale suivante:
Nom et adresse du demandeur: Mamadou Tounkara, commerçant à Bamako.
Objet:Plantation d'arbres fruitiers-Elevage- Cultures Vivrières-Construction de maison à usaage d'habitation :
Situation du terrain : au nord par Bamba Tounkara, au sud par TNI, à l'ouest par la route Kita-Manako, à l'est par la famille Coulibaly
Superficie du terrain : 04 ha 06 a 90 ca
L'enquête reglementaire sera effectuée sur le terrain,objet de la demande de concession rurale le 22 octobre 2009 à partir de 9 heures 30 minutes.
Les collectivités voisines et notamment celles qui seraient éventuellement titulaires du droit d'usage sur le terrain sont invitées d' y envoyer leurs représentants.

CERCLE DE KAYES

Le Prefet du cercle de Kayes à l'honneur d'informer les populations de la commune rurale de la Falémé Singulièrement celle du village de Diboli, qu'il est saisi de la demande de concession rurale suivante:
Nom et adresse du demandeur: Seydou Diop, déclarant transitaire à Diboli.
Objet:Plantation d'arbres fruitiers-Construction de maison à usaage d'habitation :
Situation du terrain : le terrain demandé est situé dans le village de Diboli, commune rurale de Falémé, il est limité au nord par un voisin, au sud par une rue, à l'ouest par un voisin et à l'est par une rue
Superficie du terrain : 05 ha 00 a 00 ca
L'enquête reglementaire sera effectuée sur le terrain,objet de la demande de concession rurale le 16 septembre 2009 à partir de 9 heures.
Les collectivités voisines et notamment celles qui seraient éventuellement titulaires du droit d'usage sur le terrain sont invitées d' y envoyer leurs représentants.

Le Sous-Prefet de Kayes à l'honneur d'informer les populations de la commune rurale de Liberté Singulièrement celle du village de Kamankolé, qu'il est saisi de la demande de concession rurale suivante:
Nom et adresse du demandeur: Salim Sylla, transporteur à Kayes Lafiabougou.
Objet:Plantation d'arbres fruitiers-Construction de maison à usaage d'habitation :
Situation du terrain : le terrain demandé est situé dans le village de Kamankolé, commune rurale de Liberté-Dembaya, il est limité au nord par un voisin, au sud par un voisin, à l'ouest par un voisin et à l'est par une rue
Superficie du terrain : 12 a 00 ca
L'enquête reglementaire sera effectuée sur le terrain,objet de la demande de concession rurale le 30 juin 2009 à partir de 9 heures.
Les collectivités voisines et notamment celles qui seraient éventuellement titulaires du droit d'usage sur le terrain sont invitées d' y envoyer leurs représentants.

CERCLE DE KOULIKORO

Le Prefet du cercle de Koulikoro à l'honneur d'informer la population Dokoro, commune rurale de Tienfala et environnement, qu'il est saisi d'une demande de titre provisoire de propriété de concession rurale émanant :
Nom et adresse du demandeur: Monsieur Brahima Touré, ouvrier à 2645 de avenu API 4-R New York NY 10030.
Objet: Cultures Vivrières-Elévage, Plantation d'arbre fruitier
Situation du terrain : sise à Dokoro
Superficie du terrain : 01 ha 32 a 13 ca
L'enquête reglementaire sera effectuée sur le terrain,objet de la parcelle n° BK / 115 le 17 octobre 2009 à partir de 10 heures.
Les collectivités voisines et notamment celles qui seraient éventuellement titulaires du droit d'usage sur le terrain sont invitées d' y envoyer leurs représentants.

Le Prefet du cercle de Koulikoro à l'honneur d'informer la population Dokoro, commune rurale de Tienfala et environnement, qu'il est saisi d'une demande de titre provisoire de propriété de concession rurale émanant :
Nom et adresse du demandeur: Monsieur Brahima Touré, ouvrier à 2645 de avenu API 4-R New York NY 10030.
Objet: Cultures Vivrières-Elévage, Plantation d'arbre fruitier
Situation du terrain : sise à Dokoro
Superficie du terrain : 02 ha 05 a 94 ca
L'enquête reglementaire sera effectuée sur le terrain,objet de la parcelle n° BK / 137 le 17 octobre 2009 à partir de 10 heures.
Les collectivités voisines et notamment celles qui seraient éventuellement titulaires du droit d'usage sur le terrain sont invitées d' y envoyer leurs représentants.

ville Flasso, rue 54, porte 543 à Sikasso.
Objet: Cultures Vivrières-Elévage, Plantation d'arbre fruitier
Situation du terrain : sise à Mananbougou
Superficie du terrain : 02 ha 54 a 07 ca
L'enquête reglementaire sera effectuée sur le terrain,objet de la parcelle SN le 9 octobre 2009 à 10 heures.
Les collectivités voisines et notamment celles qui seraient éventuellement titulaires du droit d'usage sur le terrain sont invitées d' y envoyer leurs représentants.

Le Prefet du cercle de Koulikoro à l'honneur d'informer la population Tienfala, commune rurale de Tienfala et environnement, qu'il est saisi d'une demande de titre provisoire de propriété de concession rurale émanant :
Nom et adresse du demandeur: Monsieur Mahamoud Haïdara, commerçant, domicilié à Korofina-nord, Razel près 6ème arrondissement.
Objet: Cultures Vivrières-Elévage, Plantation d'arbre fruitier
Situation du terrain : sise à Tienfala
Superficie du terrain : 03 ha 16 a 24 ca
L'enquête reglementaire sera effectuée sur le terrain,objet de la parcelle SN le 9 octobre 2009 à 10 heures.
Les collectivités voisines et notamment celles qui seraient éventuellement titulaires du droit d'usage sur le terrain sont invitées d' y envoyer leurs représentants.

Le Prefet du cercle de Koulikoro à l'honneur d'informer la population Tienfala, commune rurale de Tienfala et environnement, qu'il est saisi d'une demande de titre provisoire de propriété de concession rurale émanant :
Nom et adresse du demandeur: Monsieur Mahamoud Haïdara, commerçant, domicilié à Korofina-nord, Razel près 6ème arrondissement.
Objet: Cultures Vivrières-Elévage, Plantation d'arbre fruitier
Situation du terrain : sise à Tienfala
Superficie du terrain : 03 ha 51 a 11 ca
L'enquête reglementaire sera effectuée sur le terrain,objet de la parcelle SN le 9 octobre 2009 à 10 heures.
Les collectivités voisines et notamment celles qui seraient éventuellement titulaires du droit d'usage sur le terrain sont invitées d' y envoyer leurs représentants.

CERCLE DE BOUGOUNI

Le Sous-Prefet auprès de la commune rurale de Koumantou, cercle de Bougouni, informe la population, qu'il est saisi de la demande de concession rurale suivante :
Nom et adresse du demandeur: Monsieur Bakary Togola, agriculteur domicilié à Niamala commune rurale de Koumantou
Objet: Exploitation agricole
Situation du terrain : sise à Niamala (Toni N'Kala Farada)
Superficie du terrain : 02 ha 50 a 00 ca
L'enquête reglementaire sera effectuée sur le terrain,objet de la demande de concession rurale le dimanche 6 septembre 2009 à 10 heures.
Les collectivités voisines et notamment celles qui seraient éventuellement titulaires du droit d'usage sur le terrain sont invitées d' y envoyer leurs représentants.

Le Sous-Prefet auprès de la commune rurale de Koumantou, cercle de Bougouni, informe la population, qu'il est saisi de la demande de concession rurale suivante :
Nom et adresse du demandeur: Monsieur Bakary Togola, agriculteur domicilié à Niamala commune rurale de Koumantou
Objet: Exploitation agricole
Situation du terrain : sise à Niamala (Toni N'Kala Farada)
Superficie du terrain : 02 ha 50 a 00 ca
L'enquête reglementaire sera effectuée sur le terrain,objet de la demande de concession rurale le dimanche 6 septembre 2009 à 10 heures.
Les collectivités voisines et notamment celles qui seraient éventuellement titulaires du droit d'usage sur le terrain sont invitées d' y envoyer leurs représentants.

Le Sous-Prefet auprès de la commune rurale de Koumantou, cercle de Bougouni, informe la population, qu'il est saisi de la demande de concession rurale suivante :
Nom et adresse du demandeur: Monsieur Bakary Togola, agriculteur domicilié à Niamala commune rurale de Koumantou
Objet: Exploitation agricole
Situation du terrain : sise à Niamala (Toni N'Kala Farada)
Superficie du terrain : 02 ha 50 a 00 ca
L'enquête reglementaire sera effectuée sur le terrain,objet de la demande de concession rurale le dimanche 6 septembre 2009 à 10 heures.
Les collectivités voisines et notamment celles qui seraient éventuellement titulaires du droit d'usage sur le terrain sont invitées d' y envoyer leurs représentants.

Le Sous-Prefet auprès de la commune rurale de Koumantou, cercle de Bougouni, informe la population, qu'il est saisi de la demande de concession rurale suivante :
Nom et adresse du demandeur: Monsieur Bakary Togola, agriculteur domicilié à Niamala commune rurale de Koumantou
Objet: Exploitation agricole
Situation du terrain : sise à Niamala (Toni N'Kala Farada)
Superficie du terrain : 02 ha 50 a 00 ca
L'enquête reglementaire sera effectuée sur le terrain,objet de la demande de concession rurale le dimanche 6 septembre 2009 à 10 heures.
Les collectivités voisines et notamment celles qui seraient éventuellement titulaires du droit d'usage sur le terrain sont invitées d' y envoyer leurs représentants.

Le Sous-Prefet auprès de la commune rurale de Koumantou, cercle de Bougouni, informe la population, qu'il est saisi de la demande de concession rurale suivante :
Nom et adresse du demandeur: Monsieur Bakary Togola, agriculteur domicilié à Niamala commune rurale de Koumantou
Objet: Exploitation agricole
Situation du terrain : sise à Niamala (Toni N'Kala Farada)
Superficie du terrain : 02 ha 50 a 00 ca
L'enquête reglementaire sera effectuée sur le terrain,objet de la demande de concession rurale le dimanche 6 septembre 2009 à 10 heures.
Les collectivités voisines et notamment celles qui seraient éventuellement titulaires du droit d'usage sur le terrain sont invitées d' y envoyer leurs représentants.

Le Sous-Prefet auprès de la commune rurale de Koumantou, cercle de Bougouni, informe la population, qu'il est saisi de la demande de concession rurale suivante :
Nom et adresse du demandeur: Monsieur Bakary Togola, agriculteur domicilié à Niamala commune rurale de Koumantou
Objet: Exploitation agricole
Situation du terrain : sise à Niamala (Toni N'Kala Farada)
Superficie du terrain : 02 ha 50 a 00 ca
L'enquête reglementaire sera effectuée sur le terrain,objet de la demande de concession rurale le dimanche 6 septembre 2009 à 10 heures.
Les collectivités voisines et notamment celles qui seraient éventuellement titulaires du droit d'usage sur le terrain sont invitées d' y envoyer leurs représentants.

Le Sous-Prefet auprès de la commune rurale de Koumantou, cercle de Bougouni, informe la population, qu'il est saisi de la demande de concession rurale suivante :
Nom et adresse du demandeur: Monsieur Bakary Togola, agriculteur domicilié à Niamala commune rurale de Koumantou
Objet: Exploitation agricole
Situation du terrain : sise à Niamala (Kaba Koungo Dougoudjila)
Superficie du terrain : 02 ha 50 a 00 ca
L'enquête reglementaire sera effectuée sur le terrain,objet de la demande de concession rurale le dimanche 30 août 2009 à 10 heures.
Les collectivités voisines et notamment celles qui seraient éventuellement titulaires du droit d'usage sur le terrain sont invitées d' y envoyer leurs représentants.

Le Sous-Prefet auprès de la commune rurale de Koumantou, cercle de Bougouni, informe la population, qu'il est saisi de la demande de concession rurale suivante :
Nom et adresse du demandeur: Monsieur Bakary Togola, agriculteur domicilié à Niamala commune rurale de Koumantou
Objet: Exploitation agricole
Situation du terrain : sise à Niamala (Kaba Koungo Dougoudjila)