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**A critical analysis of the introduction of essential
oil distillation in the High Atlas of Morocco with
reference to the role of gendered traditional
knowledge**

Thesis submitted for the degree of PhD in Ethnobiology

by

Bernadette Montanari

School of Anthropology and Conservation

University of Kent at Canterbury

2012

Abstract

A new decentralisation policy in Morocco in line with international development best practice policies promises a close partnership with local communities to overcome local natural resource degradation, poverty and out-migration. Community-based resource management is believed to enhance these strategies. This thesis investigates and evaluates the mechanisms of implementation for a project to produce essential oil in a Berber community of the High Atlas Mountains, and seeks to examine the role of gendered traditional practices in this context.

Using ethnobotanical and anthropological approaches, the research identifies factors that jeopardise the successful implementation of the project. At the macro level, the study suggests that a decentralisation policy claiming to be participatory does not address the central local issues, and does not build on community norms and customs that might better facilitate implementation of the project. It is shown that the aim of the government is not to integrate the community as an equal partner in decision-making, to promulgate local socio-economic development, but rather to act as an employer of a local labour force.

Within the community, the project was initially perceived as promising socio-economic leverage, but has so far benefited only a handful of individuals. Local lineage politics and traditional political culture threatens community development. Although these also influence women's interests, my results show that traditional knowledge practices, especially those of women, are crucial to the success of the enterprise.

The study reveals, however, that the community possesses inherent key features that would facilitate community-based resource management. These refer to the communities' internal organisation, a population eager to earn an income, and an abundance of aromatic and medicinal plants, particularly thyme and lavender, from which a valuable essential oil is extracted. The communities could therefore benefit from the onward sale of these products in the country's lucrative herbal market.

Acknowledgements

This thesis could not have been completed without the co-operation, help and support of many people. In particular, my gratitude goes to the people of El Maghzen and to the eight villages of the Agoundis valley who agreed to host and participate in the study and who, between them, have provided the majority of the field data upon which this thesis is based.

In particular, I would like to mention the Aid Abderkrim family, Mohamed, Ijja, Mina, Fatima, Omar, Mustapha, Lhacen and Brahim for being my host family and made it possible to establish myself in El Maghzen. Thank you to Fadma (El Maghzen), Mustapha from Tijrichte, Fouad from Ijoukak, Abdou and Jamal from Marrakech for their effort to conduct interviews with me, often in difficult climatic conditions throughout the valley. Thank you to Said El Badaoui from Ijoukak, Omar Rome, Youssef Hammouzachi from the Department of Water and Forestry, Amour de Riad in Marrakech, Jaafar, Mohamed, Olivier, Vincent, Isabelle Kuc, Marc and Andre Montanari and the whole Montanari family for their support, Fadia Merabet, Diarra Wade, Sannae Hammi, Allae, Kebir, Mohamed Knidiri from the Association Le Grand Atlas, Farid Kassidi, Mohamed Alifriqui, Khalid Bekkouche, Abdelaziz Abbad, Abderrahmane Romane from Semlalia, Faculty of Sciences, University Cadi Ayyad in Marrakech, Michael Mills for his meticulous proof reading. Thank you to the governor of Al Haouz Province and Khadija from the Ministry of Interior in Rabat for speeding up the delivery of my research permits. A very special thank to Professor David Leach from Southern Cross University, Australia, who has permitted the contact with the Laboratoire de Biotechnologies Végétales appliquées aux Plantes Aromatiques et Médicinales, Université Jean Monnet, St Etienne in France, and Professor Laurent Legendre for the phyto-chemical analysis of the essential oils.

At the University of Kent, I am most grateful to my supervisor Professor Roy Ellen for his excellent guidance, patience and support throughout, a special thank to Dr Rajindra Puri, Dr Anna Waldstein, Dr Helen Newing, my colleagues from the School of Anthropology and Conservation, Calum Blaikie, Graciela Alcantara Salinas, Oswaldo de Carvalho Jr, Peter Wilkin, Yoshimi Osawa for their support. Thanks to Dr Gary Robinson from the School of Biosciences at the University of Kent, for his advice on essential oil chemistry.

A deep thought goes to my father who passed away just before I left for my fieldwork. A big and special thank to my son Luke who has always encouraged and supported me. I thank my close friends the Brahka family, Patrick Dear, Denise and Richard, my close French friends Ginette, Patrick and Lucienne, Louis and Rosanna for their support.

This research would not have been possible without the financial support of the Gen Foundation, the FFWG, the John Ray Trust and the Royal Anthropological Institute.

Finally, I dedicate this thesis to all Amazigh people throughout Morocco and the Maghreb in the hope that through enterprise, they may reintegrate their identity and preserve their culture.

Acronyms

ABD African Bank of Development
ADS Agence de développement solidaire
CADEFA Coopérative Agoundis de Développement de l'Environnement Forestier et Agricole
CBE Community-based enterprise
CBNRM Community-based resource management
CBO Community-based organisation
CDRT Centre de développement de la région du Tensift
CSCM Conference of Security and Cooperation in the Mediterranean
DPA Direction départementale de l'agriculture
EU European Union
ESW Economic and sectorial work
ENP European Neighbourhood Policy
DREFF Direction régionale des Eaux et Forêts
FEM Fonds Environnement Mondial
FIDA Fonds International de développement de l'Agriculture
FSD Fonds Saoudien pour le développement
FTA Free trade area
GEF Global Environment Facility
GDP Gross Domestic Product
GTZ German society for technical cooperation
HCP Haut Commissariat au plan
HCEFLCD High Commissioner of Water and Forestry and Fight against Desertification
HCEFLCD Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification
HPLC high performance liquid chromatography
IFAD International fund for agricultural development
IMF International Monetary Fund
INDH Initiative Nationale de développement humain
IRD Institut de recherche et de développement
INRA Institut national de recherche pour l'agriculture
IRCAM Institut royal de la culture Amazigh
MAP Medicinal and aromatic plants
MDG Millennium Development Goals
MPC Mediterranean partner countries
MSA Moroccan standard Arabic
ODECO Office du développement et de la coopération
PAN Plan d'action National de lutte contre la désertification
PNUD Programme des nations unies pour le développement
TCM Traditional Chinese medicine
TNP Toubkal National Park
UNCED United Nations Conference on Environment and Development
UNDP United Nations Development Programme
UNESCO United Nations Educational, Scientific and Cultural Organization
WB World Bank
WHO World Health Organization
UNIFEM Fonds des Nations Unies pour la Femme
UNOPS United Nations Office for Project Services

USFTA US Free trade agreements
US United States

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CHAPTER 1

Introduction

1.1 Development theory and practice

The aim of this thesis is to understand the mechanisms by which a ‘participatory’ essential oil distillation project in the High Atlas mountains of Morocco has been implemented in the context of an avowed policy of decentralization. The distillation project in the Agoundis valley is also examined in the context of policies to conserve the natural resources of the Toubkal National Park, of which it is part. There is currently very little analysis of project implementation relating to community natural resource management and socio-economic development in Morocco, particularly in relation to how this can build on local knowledge and the role of women. This thesis makes a contribution to the body of literature regarding current use and future potential of medicinal and aromatic plants, and to the challenges of decentralized development in Morocco. In addition, it sheds light on the problems of socio-economic disparities and poverty alleviation in remote mountainous regions.

In Morocco, as elsewhere, it is macro-level policies that determine decentralised measures. These policies aim to address natural resource degradation, poverty and out-migration in a regional context. Decentralisation, which refers to the transfer of responsibility for planning and management, resource acquisition and allocation, from the central government and its agencies, implies that these various functions are transferred to subordinates at various geographically-dispersed intermediate and local levels (Rondinelli et al. 1989; Dillinger 1994; Ribot 2005). However, the discourse of ‘decentralisation’ is not new in Morocco. The government has been trying to reform its political structures in this direction since 1960 (Work 2002), although the earliest attempts go back even further, to the Protectorate. Most recently, the government has reviewed its decentralisation reforms to explicitly meet the double challenge of moving towards ‘western-style’ democracy, and integration into a global market economy (Desrues and Moyano 2001). These new initiatives seek to offer solutions to problems in natural resource conservation, poverty alleviation, desertification, and out-migration towards urban areas. The new public policies seek to create new working spaces to respond to the needs of deprived rural populations, working in close collaboration with

the goal of sustainable development. In this context, the state claims the role of a partner close to the local populations in order that it can fulfil their needs. In theory, this process should encourage local communities to participate actively and benefit fully from these directives (Zyani 2002).

From its first appearance as a distinct intellectual space in the 1950s, development discourse has been viewed by many as the panacea for alleviating the conditions of the 'under-developed' world, a utopian vision for the transformation of 'under-developed' societies into those characterised by their material prosperity and economic progress, and conformity to an international economic agenda (Escobar 1988; 1995:4; Rist 2002). However, the concepts of 'coloniser' and 'colonized', 'under-developed', and 'developed' have considerably shifted in the subsequent decades, as development 'programmes' have become more explicitly targeted on problems of hunger, poverty eradication, education and health. These aims have come to justify intervention and the deployment of economic incentives (Escobar 1988a), involving global actors such as the World Bank, the UNDP, and numerous bilateral development agencies, with budgets of billions of dollars for initiatives that target economic growth, equality, poverty relief, democracy and - since the 1970s -, a revived interest in decentralisation (Conyers 1983).

Various strategies have been devised to diagnose and support the implementation of these programmes over the past 30 years, in particular the use of participatory rural approaches (PRA) and rapid rural appraisal (RRA) techniques, as advocated by Chambers (1994). These techniques have played a major role in working with communities and have permitted not only the inclusion of important community parameters (geographical and historical backgrounds, and community mapping), but also the identification of attributes of poverty, vulnerability, sickness and isolation (Chambers 1995), and have furthered our understanding of 'powerlessness', the 'weapons of the weak', and other characteristics of the 'moral economies' of the poor (Scott 1998). However, used mechanistically, these techniques have also presented communities as 'technical bounded units', reducing them to features in need of corrective measures that only the intervention of experts can provide (Li 2007:7,123).

This trend has therefore led to what Williams (2004) and Botchway (2001) regard as the de-politisation of development since the 1970s (meaning a project engineered by states through top-down policy), and a new emphasis on the community level, a process recently enhanced by a new terminology that includes words such as

‘empowerment’, ‘participation’, ‘poverty reduction’, ‘women and gender issues’, and as a result of the growing significance of environmental politics, the inclusion of ‘the concept of nature’ (Escobar 1995a) with emphasis on ‘sustainability’ and ‘community resource management’, ‘community mapping’, ‘indigenous knowledge’, and similar terms. These, which Cornwall and Brock (2005) describe as ‘seductive buzzwords’, in particular ‘participation’ with its connotation of optimum involvement, convey a positive, purposeful and promising image of development, a world where local people are actively involved in the decision-making process, who, once empowered, are then able to take on the responsibilities for their own development, making appropriate choices with competitive external markets, and are especially able to fit and respond to development schemes (Williams 2004a; Botchway 2004; Purcell and Onjoro 2002; Li 2007a:234). This new trend in development thinking has raised important issues and been criticised for ultimately modifying the focus and content of communities’ participation, barely addressing the social changes that need to take place in order to bring effective structural reforms. Rather, these initiatives increase the gap and inequalities within most communities, dismissing key contextual issues that would otherwise permit communities to work towards the attainment of social and environmental goals. Often removed and detached from local realities, these strategies have become ultimate targets, vital criteria for gauging the success outcomes of project schemes, and key prerequisites for donor agencies endorsement (Botchway 2001a; Sneddon et al. 2006).

International development and funding agencies, however, continue to be drawn towards these kinds of interventions. Morocco has, for example, been encouraged to meet the requirements of international financial institutions, such as the World Bank, and adopted a macro-political agenda, which reaches the country’s most remote and poor rural populations. In order to achieve this, the government seeks to implement projects and programmes with the goal of increasing its role as an engaged partner with the subjects of its interventions through participatory approaches (Bajeddi 2007). In this connection, a project to distil essential plant oils and to process herbal products was established in El Maghzen, a village, in the Agoundis valley, supported by a Marrakech NGO in 2005. The main physical evidence of this was the installation of an *alembic* (the apparatus for distilling essential oils) in 2009. This ‘decentralised’ distillation project is the only one in the region and represents a major economic opportunity for local people. The villagers, however, had never taken part in any major commercial venture before.

1.2 Aims and objectives

My initial aim in embarking on the research project described here was to understand how one project was actually implemented, from an ethnographic point of view. I was particularly interested in finding out how the perception, aspirations and will of the local people could be harnessed for such a process. At the same time, I sought to understand the project as viewed by the initiating institutions and the development agencies involved. I was interested in finding out how top-down directives and local-level priorities and expectations met, and how local people and external institutions interacted and worked together.

The specific objectives of the research were:

- To examine how the perceptions of the local actors (harvesters, processors, middlemen, external agents) influence implementation of the oil distillation project.
- To assess thyme sustainability and the potential economic value of the distillation project.
- To evaluate the relationship between traditional ecological knowledge, particularly that of women and the implementation of the project.
- To examine the project in the context of comparative studies of decentralisation and community-based approaches.

In the context of these objectives, I have sought to address the following research questions:

1. Under conditions of chronic poverty, how are local perceptions integrated into a decentralized project?
2. Given that thyme harvesting represents a major cash income stream for the household, how do respondents perceive the method of harvesting thyme and its long-term sustainability?
3. How is women's traditional knowledge as opposed to men's integrated into the process?
4. Is women's drive for change or stability a factor in the implementation of the enterprise?

5. Is relevant local knowledge likely to erode in the new political and economic context?

1.3 The research location: El Maghzen, Agoundis Valley, High Atlas Mountains

El Maghzen is a Berber village in the Agoundis valley, about 100 kilometres from Marrakech. It is part of the Talat n'Yakoub circle¹ in Al Haouz province and is close to the Toubkal National Park, a biodiversity 'hot-spot'. The disparity between the cities and these areas is considerable, mostly because the populations are poor, marginalised, and lack the basic infrastructures for development. The inhabitants represent one of the poorest segments of Moroccan society in terms of literacy, infant mortality, availability of potable water, electrification and other development indicators (Russell 2004). Although the environment is biologically rich, especially in aromatic and medicinal plants, the region's natural resources overall are declining owing to over-harvesting in the face of the increasing demand for phyto-aromatic products and the needs of a growing population. Local people harvest plants during the summer months, for both herbal medicine and for trade, the most important being thyme (*Thymus satureioides*), sage (*Salvia aucheri*) and a species of lavender (*Lavandula dentata*). These plants are one of the few sources of cash income. The plants are traded down the valley via several middlemen to urban markets in Marrakech and beyond. The trade follows two commodity chains, one official and the other informal and illegal (Montanari 2004). Although this income varies in terms of the amount of plant material collected, it nevertheless represents an important contribution to the household economy.

In the past, the inhabitants of the villages in the Agoundis valley had collective rights of access to the land for their subsistence needs, e.g. harvesting medicinal plants and collecting wood for fuel and building material. An autonomous system of Berber customary law, known as *jama'a*, regulated rights of access to land for grazing, forests and water. This traditional law, never codified, was rather flexibly applied for solving problems of resource use. It regulated not only individual access but also collective access, and was integrated into the cultural and political life of the community (Id Balkassm 2002). In 1917, during the French colonial period, the national government

¹ A circle or 'cercle' in French was the smallest administrative unit of the French colonies in Africa. A circle was usually composed of districts, and these composed of several villages (Personal communication, Alifriqui 2008).

claimed to own the land and the Department of Water and Forestry was assigned the task of control. Since then, village residents have had limited access to their traditional lands, and only for the collection of dead wood and medicinal plants. In times of conflict and confusion over land access, during the Protectorate and at the present time, people have fallen back on customary law to access the resources. Currently, local people can only collect plants for personal use. If caught collecting for trade, they are fined by the Department's representative.

Distillation of essential oil is an ancient tradition in Morocco and has changed little over the centuries. Local distillers buy wild plants from harvesters, mainly verbena (*Lippia citriodora*), thyme (*Thymus satureioides*) and wormwood (*Artemisia herba alba*), and process them on the spot. The equipment consists of a home built still, a cylindrical container usually made of copper (figure 1.1), which accommodates the plants. Traditionally, a fire would heat the apparatus, in which a mushroom-shaped top fitted tightly over the container. As water boils the plant material, a mixture of steam and oil vapours leaves the container from a pipe inserted in the lid. The mixture enters the condenser where the distillate is passed through the cooling water of the condenser, which then runs into a glass container where it separates as water and oil (see also figure 9.3, Appendix 9). This traditional system is slow and prone to overheating, which damages the plant material and jeopardises the quality of the oil (Ismaili-Alaoui 2003). The question therefore arises as to whether this traditional method might be upgraded to a commercial scale, so that benefits can return to the local populations.

Figure 1.1: Old fashion alembic. **Source:** The Alembic valley.
<http://www.travelingtoitaly.com/tag/leisure>



1.4 Development in remote areas

Until recently, *Amazigh*, or Berber,² communities and their culture have received little official recognition in Morocco. The government has tried for many years to implement decentralized measures in the most deprived areas. It has struggled to integrate these communities into development strategies and so far has failed. To illustrate this, Boujrouf (2004) provides clear examples of three different projects that have taken place in the mountain regions of Morocco over the past 30 years (Appendix 1). These projects, which have aimed to fight desertification and deterioration of natural resources, all failed. Boujrouf argues that, being technocratically conceived, they lacked coordination at both the national inter-ministerial level and at the local administrative level. They were also typified by the absence of local consultation and participation, further aggravating the incomprehension and hostility of local people. Moreover, there were important discrepancies between the political initiatives, the allocated budgets, and actual implementation. Too often, the projects served the interests of a minority of bureaucrats who were able to use these actions to increase their economic position and to reinforce local power structures. The government failed to introduce adequate incentives taking into account the social, psychological and material dimensions of poverty and the necessary measures to empower the communities. It has, as a result,

² The local name for Berber is Amazigh, Imazighen being the plural form and translating as ‘free men’. Tamazight refers to the singular, feminine form and is the spoken language of the Middle Atlas (Merolla 2006).

failed to introduce adequate incentives for the inclusion of these parameters into the directives.

The mountain areas of Morocco offer significant untapped human and natural development potential. These areas abound in natural resources, particularly aromatic and medicinal plants. The people and the landscapes have always been changing, shifting, and self-regenerating. Because these regions face strong environmental constraints, the populations are called to manage their environment, something that they do generally well, contrary to the widespread current belief that local people mismanage their resources (Ostrom 1990; Scoones 1994; Pretty and Pimbert 1995; Leach and Mearns 1996; Pretty and Shab 1997; Ghimire and Pimbert 1997). However, these same populations face considerable obstacles as far as development is concerned. In the Atlas mountains, living conditions are generally very hard and difficult to improve while the central government has always privileged the Atlantic coast and its hinterland. Although comprising less than half of Morocco, the Atlantic coast has always been the main area for export-led agriculture and mineral extraction (Boujrouf 2003). The autarchy of the inhabitants of the High Atlas and their hostility to central government initiatives has hindered many proposed measures of development in the past, and represent a major problem (Boujrouf 2003a, 2004a).

The government has neglected these remote locations for a long time. The core Atlantic coast of the Moroccan political domain was ruled (and still is to some extent) by the *Makhzen* or 'central' government. The rest of the country, deserts and mountains, was traditionally known as *bilad al-siba* (land of abandonment), i.e. territory on the margins of the *Makhzen*, which resisted the payment of taxes and which the government struggled to subdue. The inhabitants of the regions were of Berber origin (Hart 2000). Moreover, before the establishment of the French protectorate, power was distributed among tribal clans. Throughout the French protectorate, the *Makhzen* managed the tribes through a policy of divide and rule, utilising *caids*, notable men generally from rich families who performed combined administrative, judicial and financial functions. With time and pressure, the tribes were subjugated (Boujrouf et al. 1998).

My first visit to El Maghzen in the Agoundis valley was in 2004 when I conducted a study of the local aromatic and medicinal plants, and of alternatives to the existing illegal trade (Montanari 2004a). I returned to the village several times afterwards to develop a research proposal for my doctorate. Meanwhile the Moroccan local authorities, together with international agencies, had begun various initiatives for

the development of the poor and remote areas in the valley. The obvious solution to poverty and out-migration were new local employment opportunities based on the extraction of aromatic plants. In particular, with the expansion of fair trade initiatives, tourism and eco-tourism in Morocco, it made sense to encourage external companies to obtain their essential oils directly from the community, and for tourists to buy local products while visiting or staying in accommodation in the valley. Demand for herbal and aromatherapy plants and their derivatives have increased tremendously in recent years, both inside and outside Morocco. Morocco stands second only to Turkey in terms of aromatic and medicinal plant export to Europe and the United States (Patzold et al. 2006). The question was: could an essential oil distillation project actually work in the Agoundis and would local people be motivated to participate in it?

1.5 Community-based resource management

Decentralisation, and in particular Community-based Natural Resource Management (CBNRM), is nowadays at the heart of the international political agenda with respect to development and the environment. It is often argued that such reforms will democratise local government and thereby improve service delivery, management, conservation and local development. Decentralisation is claimed to hold the promise of promoting democracy by bringing the state closer to the people, increasing local participation and building upon social capital (Agrawal and Ribot 1999; Rondinelli et al. 1989; Dillinger 1994). Indeed, decentralisation and CBNRM are both a crucial part of the Millennium Development Goals that aim to halve world poverty and hunger, and to establish universal education and gender equality -by 2015 (Work 2002a). Politicians and policy makers seek to fulfill these promises through programmes that address community participation and pro-poor advocacy.

It is generally assumed that traditional communities can best manage their natural resources efficiently in a sustainable manner, which implies that these same communities take an active part in responsible participatory decision-making (Blaikie 2006). However, past attempts to empower local populations have not always had the expected results (Agrawal and Ribot 2000; Ribot, Chhatre and Lankina 2008; Katsiaouni 2003; Blaikie 2006). Deliberately engineered decentralisation has been heavily criticised for creating new inequalities, asymmetrically empowering local elites, and for general ineffectiveness (Fritzen and Lim 2006). Nonetheless, advocates of such programmes argue that they can still succeed if they address issues of accountability,

transparency, and equity and citizen participation in an integrated way (Fisman and Gatti 2002). Among many other factors, individual and economic incentives, good leadership, stakeholder participation and recognition of problems pertaining to good management, have been identified as crucial for good community resource management. Yet these will not become effective if empowerment is not endorsed within the socio-cultural and political context of the community (Pomeroy et al. 1998). It is further emphasized that empowerment is at the heart of successful resource management even if it means transferring the economic and political power from a handful of top decision-makers to the marginalized. Empowerment may come from an individual or from a community's strong will for change. The latter was the case for San Juan Nuevo, Mexico (Orozco-Quintero and Davidson-Hunt 2010), where the local people took directives into their own hands, and which won the Alcan Prize for Sustainability in 2004. Its success did not come through the framework that had been originally set for them, but rather from the disruption and discontentment that the framework produced. Out of the chaos was born a new socially based enterprise. The inclusion of the community's own rules for resource-use management was no doubt instrumental in determining the success of the enterprise. More generally, it is becoming increasingly clear that new forms of natural resource management based on social organisation that ensures local-level protection are essential if sustainable economic development is to be achieved (Pretty and Ward 2001).

1.6 Indigenous entrepreneurship

In the 1960s development was synonymous with modernization. Higher economic growth through industrialization, urbanization, increased use of technology and machinery had become indicators of a country's achievement. How developing countries could shape policies to accelerate growth and increase living standards was a central part of the dominant discourse. Monetary income and the ensuing economic growth were regarded as key elements in measuring the quality of life, and people motivated by self-interest and rational economic behaviour were seen to represent such achievements. From this viewpoint, there was an expectation that 'underdeveloped' countries would over time assume the features of industrialised nations. At the same time, the belief was that 'underdeveloped countries' must transform their weak and culturally backward societies to something nearer the model of Western capitalist societies. The 'backward culture' of societies in developing countries was perceived as

the main cause of underdevelopment, and the underlying assumptions of modernisation were that traditional culture and social structure, and linguistic fragmentation, were barriers to progress (Peredo et al. 2004; Krueger 1997; Mchumbo 2004). However, economic growth and wealth are seldom evenly distributed, and the impacts on major indicators do not necessarily reflect social issues, particularly those of health and education. Although the injection of economic capital is necessary for programmes of development, it does not guarantee sustainability and whether or not initiatives will succeed. Indeed, the importance of social capital, including networks that enable people to act collectively has often been underestimated and can play a vital role in local community development initiatives (Woolcock and Narayan 2000; Dale and Newman 2010).

By 2000, the new strategies for addressing development had become poverty alleviation, sustainability of the natural environment and the conservation of natural resources. People's empowerment was central to this, especially emphasising gender issues, participatory approaches, and illiteracy programmes. These are all very embodied into the Millennium Development Goals (MDG) (Work 2002b). They have so far proved to be controversial, particularly in the context of the current world economic crisis (Sumner and Melamed 2010). The world's poor, of which 250 to 300 million indigenous people are part, remain vulnerable and often the development process has damaged their traditional economies (Peredo and Anderson 2006; Anderson et al. 2005).

The paradigm of indigenous entrepreneurship drawing on the concept of 'community-based enterprise' on the other hand is not new. Recommendations to integrate traditional knowledge (IT, TK) into enterprise interventions emerged as early as 1990 (Grenier 1998). As defined by Peredo et al. (2004a:4), community-based enterprise (CBE) is:

The result of a process by which a community pursues the common good and acts as both an entrepreneur and an enterprise, in order to create and operate a new enterprise embedded in its existing social structure. In this managed process, the aim of this community-based enterprise is to pursue social and economic goals in such a way that sustainable individual livelihood and group benefits can be maintained over the short and long-term.

The prospect of enterprise where members of a community act in a corporate manner holds the promise of bypassing the problems of sustainable livelihoods. The roots of community-based enterprise lie in the attempts of communities under stress to solve pressing economic and social problems, sometimes including the attempt to address the absence of political power or a voice in national life. Indigenous peoples and local communities through their long term acknowledged resource-appropriation practices (such as farming, hunting, fishing), have developed knowledge about the interaction of humans with natural systems. This plays an important role in the management of biodiversity. It is claimed to offer the poor communities solutions for environmental conservation and income generation at the same time (Castillo et al. 2005; Mauro and Hardison 2000).

1.7 From community based natural resource management to indigenous entrepreneurship

Ironically, and as is often the case, poor local communities live within environments containing natural resources that offer critical assets for local or national development, yet are often denied the access to this potential (Barry et al. 2003). As someone in El Maghzen told me: ‘Let them give us the money and we all know what to do with it, we can manage’. Beyond community-based natural resource management, local enterprise is firmly anchored in people’s strong feelings and values towards their land, heritage and self determination. The integration of these values is thought to address urgent problems such as overcoming poverty, poor health, low educational levels, poor socio-economic conditions. It could play an important role in the reconstruction of community identity and in the re-establishment of control over traditional territories. Self determination and heritage preservation are central to re-affirming this identity and local entrepreneurship has the potential to achieve this (Perodo et al. 2004b; Hindle and Lansdowne 2005; Lindsay 2005; Peredo and Anderson 2006a). These disadvantaged communities, previously denied the benefit of effective control and essential decision-making, increasingly become the focus of attention of entrepreneurship. In a world increasingly adapting to the concept of globalisation where geographical, social and cultural constraints are expanding towards a global market, the global competitive environment is encouraged to change dramatically; vital components such as growth, poverty and sustainable development and entrepreneurship for future global

development, policies and research rest on economic incentives at the local level. Empowerment through local entrepreneurship holds the promise of repairing much of the damage done to a community and has the potential to release economic agents into a competitive world market (Ahmed and Mc Quaid 2005). What is claimed today, more than ever before, is that conservation and development programmes must be designed around community' values of equity and cooperation, congruent with community norms (Uphoff and Buck 2006; Schwartzman and Zimmerman 2005). This is backed by a strong desire amongst community leaders and members to have control of local ventures, embedded in the belief that it will permit the control of their own destiny. This desire to create work opportunities within the community is strong, a prospect that will ultimately draw the younger members of the community back to the traditional lands in order to re-establish a sense of hope and creativity (Allen Consulting Group 2001).

There is now evidence of positive outcomes for biodiversity conservation in the context of the growing number of community-based enterprises throughout the world. For example, the ITTO (International Tropical Timber Organisation) has been increasingly successful in enforcing certification (Molnar et al. 2007; Bhat and Ma 2004; Douglas and Simula 2010; Gullison 2003:154); hundreds of millions of people in India for instance rely on part-time employment that small-scale forest industries based on NTFPs (Non-Timber Forests Products) provide. These enterprises are often family-based, which means that even the poorest members in a society can participate in labour intensive work that requires small capital input. For example, Mallik (2001) and Sarap (2004) estimates that 45 000 tons of kendu (*Diospyros melanoxylon*) leaves are harvested by 1.8 million women in Orissa. Through their communal organisation CICOL (Inter-communal Peasant Central of Eastern Lomerío), Chiquitano Indian communities in eastern lowland Bolivia, with an estimated population of 5.300, have participated and contributed in the development of a vertically-integrated forest enterprise designed to both generate material benefits and secure legal recognition for indigenous territorial claims (Markopoulos 1998). Local people administer or own an estimated 25% of forests in developing countries. Revenues ranging from 10 to 25% of their household income come from non-timber forest products such as fruit, medicine and mushrooms, and from other forest goods such as baskets, tools and furniture for low-income families. Millions of farmers across the developing countries plant trees, not only to refurbish local ecosystem losses, but to respond to an increasing demand for forest products (Sherr et al. 2002). For a long time, this local workforce has been caring

for agriculture, managing livestock, have been consumers and collectors of a wide array of timber and non-timber products, guarding forests for socio-cultural and religious reasons. But they have also managed the production of timber and non-wood forest products for commercial markets (Iqbal Sial 1991). Examples of this type of entrepreneurship are numerous and include, additionally, well documented initiatives (some of which provide promising models for Morocco) in Mexico, South America, among the First Nation of Canada, the Maori in New Zealand and the Aymara of Peru, and in Asia (Neumann and Hirsch 2000; Barton Bray et al. 2003; Anderson et al. 2006).

Change in these directions, however, is not easy. Arthur (1996) reports that governments in Australia have been trying for the past 20 years to involve Indigenous communities in business ventures in order to address the most pressing issues that the Aboriginal and Torres Strait Islanders face. The Commercial Development Corporation (CDC) aimed to encourage Indigenous groups to engage with the commercial world and to form joint ventures between Indigenous and non-Indigenous partners. The overall goal was to produce a caring, mature productive nation on the basis of mutual respect between Indigenous and non-Indigenous communities, though a past history of discrimination, government neglect, poor health and education levels have mitigated against success, both amongst indigenous Australians and amongst New Zealand Maori (Foley 2003; 2006; Frederick and Foley 2006 and Reihana et al. 2007).

However, Peredo et al. (2004c) and Stevens (2001) claim that a 'second wave' movement of Indigenous activists is now improving their social and economic status via enterprise. Indigenous enterprises are increasingly attracting private companies and outside partnerships (Molnar et al. 2007a). Experiences in Canada, New Zealand and particularly the United States, provide evidence that indigenous community-business partnerships and business development can play a major role in indigenous community development. In this endeavour, financial services to facilitate the linking of mainstream markets and marginalised Indigenous communities have been targeted. For example, after 15 years of development and planning with the Saskatchewan Indian Equity Foundation, the First Nations Bank in Canada opened in 1997, a partnership between the Toronto-Dominion Bank and the Saskatchewan people (Allen Consulting Group 2001a). Taking the movement a step further, Loxley (2002; 2003) has described the case of the aboriginal community in Winnipeg, and what he calls the 'incubator approach'. He described an Aboriginal Industrial Centre which, by regrouping

aboriginal communities and bringing a variety of aboriginal organisations providing community services under one roof, achieved clear benefit financial and administrative benefits. Altman (2001, 2005) argues for hybrid market economies to resolve the problems of integrating aboriginals living in remote areas of Australia. His view is that given the numerous problems relating to customary law, state and the market economy, a hybrid economy could well address these issues. However, politicians and policy makers poorly understand this process. He emphasises the need for a hybrid intellectual approach that combines social scientific assessment regarding social and commercial viability together with an assessment of indigenous cultural practice.

1.8 The organisation of the thesis

This thesis investigates the linkage between decentralised, community-based enterprise and the integration of traditional knowledge in a specific development enterprise in the Agoundis Valley of the High Atlas of Morocco. The ethnographic focus is a distillation project for essential oils, principally based on thyme harvesting. It explores the mechanisms of implementation, and scrutinises how these processes unfold. There are two recurring themes. The first is how wider social, political and economic mechanisms influence implementation of the project. The second is the tension between the potential utility of traditional knowledge in a development context and its erosion as the Agoundis communities are progressively integrated into the national and global economy.

In the present chapter, I have given a brief description of the research location in the Agoundis valley, of my first encounter with the communities and the reason why the distillation of essential oil seemed feasible as a community enterprise. I have addressed briefly the particular development problems that Berber communities face in mountainous regions. In relation to selected available literature, I have reviewed the concepts of community-based resource management, and particularly in relation to political decentralisation and indigenous entrepreneurship, and the potential opportunities that arise from the encouragement of projects inspired by them.

In Chapter two, I review the concept of decentralization and its applications as it has been discussed and implemented over the last few decades worldwide. I examine the difference between deconcentration and political decentralization and what it entails in terms of accountability and political articulation, corruption and land conflict. I give a brief overview of successful cases of decentralization. I discuss early attempts at

decentralization in Morocco and the factors and reasons behind current decentralization processes in the country.

In Chapter three, I describe the geographical, political and general economic context in which the distillation project is situated and introduce general features of Morocco as a modern state that are relevant to understanding the analysis that follows. I then move on to describe the Agoundis valley and its inhabitants, the Berber (*Amazigh*) people. I describe the relevant history of the Berber population and the extent to which this has shaped the current political situation in the valley. I describe the socio-economic context of the Berber way of life, their subsistence economy, and the traditional regime of resource regulation, the *jama'a*.

Chapter four introduces the research methodologies employed. The first part describes briefly my fieldwork in the Agoundis valley, and the ethical and practical dilemmas that I faced given the political context of the research. I describe the villages in the Agoundis valley where I conducted interviews and the choice of survey questions and techniques, suitable for such a large and geographically disparate area, and the problems encountered in facilitating access to the villages. I describe the special groups of research subjects: the middlemen, the local authorities, the Centre de développement de la région du Tensift (CDRT) and the Toubkal National Park and Department Water and Forestry, Al Haouz provincial office and INDH, Cooperative d'Agoundis bureau and Tudert Cooperative (Smimou, Essouira). I also describe my attendance at the meeting of the 'Workshop for the restitution of the results of MAP evaluation studies for potential and added value' in Tahannaoute.

The second part of the chapter concerns the collection of data on traditional environmental knowledge in El Maghzen and the use of interviews to understand how this knowledge might be eroding.

In Chapter five, I describe the economics of herbal medicine, the reasons for the global revival of herbal medicine and aromatherapy. I examine the international demand and global scale of the trade in medicinal plants and plant extraction to supply the pharmaceutical companies. I take a brief look at the history of aromatherapy, its applications and its place in the pharmaceutical industry. I then describe the development and trade of medicinal and aromatic plants in Morocco and discuss in particular the economic value of thyme in the Agoundis valley, the commodity chain

connecting the production end to the consumer and the sustainability of thyme harvesting.

In Chapter six, I examine selected aspects of the ethnobotany of El Maghzen. I review the most important medicinal plants, their compounds of interest and the therapeutic properties that have potential in the production of herbal products. I further describe the traditional uses of these plants. I provide the results of an analysis of the distilled essential oils, and in particular discuss the phytochemical content of thyme and lavender and their potential benefit as a product. I conclude by describing the edible resources of the Agoundis valley, other than field and garden crops, and their potential for development as small cottage industries.

Chapter seven reviews the importance of traditional knowledge, and its general mode of transmission. I describe the plant knowledge of both women and men, and its means of transmission. I analyze the importance of herbal medicine within the household and the transmission of knowledge to the younger generation. I take a close look at women's and men's traditional activities in order to anticipate how this knowledge might be eroding.

Chapter eight reports on the initiation and development of the distillation project from a top down perspective. It scrutinizes the mechanisms for the allocation of project funding in the context of the Moroccan development plan and its articulation with international aid programmes. It examines the INDH funding mechanisms, the role of the province, rural commune, local authorities, NGOs, and the Department of Water and Forestry as well as identifying the emerging conflict between the institutions. Finally, it describes how local actors have apprehended the power at the local level.

Chapter nine reports on the distillation project from the perspective of the local communities. It discusses local expectations and needs. It identifies the potential community leaders, and addresses the problem of communication, and trust between the authorities and the villagers.

In Chapter ten, I discuss the relationship between my findings on the top down perspective and their implications for the success of the distillation project in the light of my data on local perspectives. I identify the main obstacles that jeopardize the project success and demonstrate that methodologies adopted by the Moroccan government to integrate the Agoundis communities are incompatible with local needs and priorities. It concludes with an assessment of the feasibility of the project. Finally, I provide an overview of the contribution that the distillation project in the Agoundis valley provides

to the general development discourse, taking into account Mosse's critical view of the project process and Paul Sillitoe's advocacy of the positive role that local knowledge and community participation might play. I conclude by summarizing my findings, and making some observations gathered during my last brief visit to El Maghzen in 2011.

CHAPTER 2

Decentralisation of Natural Resource Management and Development in a Moroccan Context

2.1 Introduction

Decentralisation has become a major issue in the development debate and an extremely popular policy worldwide (Helmsing 2000). Decentralisation has been defined as any act in which a central government formally cedes powers to actors and institutions at lower levels in a political administrative or territorial hierarchy (Larson 2004). It refers to the transfer of responsibility for planning and management, resource acquisition, and allocation from the central government and its agencies. This in turn implies that responsibilities for planning, management, and resource acquisition are transferred from central governance to subordinates at various levels (Rondinelli et al. 1989; Dillinger 1994; Ribot 2005). In all these forms, claims are made that participation in natural resource management, decisions, benefits and the restructuring of power relations between the central state and local communities are re-arranged through the transfer of managing authorities to local level organisations (Elsageer and Mbwambo 2004). These decentralised measures advocate that local people's equity and greater efficiency over local decision-making will result in increased efficacy in local investment and management, which will ultimately lead to more sustainable social and environmental development (Ribot et al. 2006). For all of these reasons, decentralisation sometimes gives the impression of being a panacea for natural resource management, development and poverty relief. The reality, however, is far more complex (Bartley et al. 2008). Indeed, the process of decentralisation reaches well beyond structural reforms of institutional frameworks, incorporating and impacting on political, economic, institutional and cultural factors (Olowu 2001). Being a relative, multi-faceted, complex and an instrumental process, decentralisation prescribes the distribution of state resources (responsibility, finance, personnel or discretionary authority) between various institutional actors within the state and society. The most important processes that we need to consider here are deconcentration and political decentralisation.

2.2 Deconcentration and political decentralisation

Deconcentration or administrative decentralisation involves the intra-organisational transfer of responsibilities whereby power is transferred from central government to lower levels of government, administration and local institutions. In this case, the local actors can exercise some form of autonomy and can be accountable to central governments (Agrawal and Ribot 1999; Ribot et al. 2006a). The primary objective of deconcentration is efficiency and effectiveness in the central administrative system. Ribot (2002) views these as local administrative ramifications of the central state. These may have some kind of downward accountability duty towards local populations in their policies but their prime functions are towards central government. Therefore, in this context, deconcentration can also include the opening of offices at a district level to improve, say, tax collection. Thus, fiscal decentralisation can ensue where governments endeavour to change the distribution of sources and resources available to local governments. This would include transfer between government levels, and changes of revenue sources transferable to local governments through the introduction of taxes, contributions and user fees. However, as Bardhan (1996) mentions, it may be that these decentralised features occur in a simultaneous manner and that a given economy may be decentralised in some respects and not in others. Manor (1999), points out that deconcentration occurs either in isolation or together with fiscal decentralisation. However, in the absence of simultaneous democratisation (in which case, agents of higher levels of government move into lower-level arenas but remain accountable only to a higher hierarchy in the system), the central authority is easily applied more effectively to these arenas, shortcutting the organisation of those who may have common interests at these lower levels. Faletti (2005) argues that decentralisation may also occur with territorial interests in mind and that if the national authorities of a country had to choose between giving away fiscal or political authority, they would rather give away fiscal leverage so that political control can be retained, in order to influence the expenditure decisions made by sub-national officials. She further argues for a model of 'sequential decentralisation'³ and the impacts on the intergovernmental

³ Faletti (2005) explains at great length the sequences of decentralisation whereby the national executive prefers administrative decentralisation (A) to fiscal decentralisation (F), which in turn is preferred to political decentralisation (P), or A>F>P. The rationale of this ordering is that the national government seeks first and foremost to divest itself

balance of power in Argentina, Columbia and Brazil. Her view reinforces that of Manor (1999a) for who power is not usually surrendered by central government but rather its officers are just relocated to different levels within a national territory. This set-up usually displays a re-arrangement of centralisation by the central government and is commonly a feature of under-developed countries where people have minimal influence over decisions or involvement in financial and skilled manpower. Lack of knowledge and the ignorance that local people may have of governmental affairs facilitate this process, a scenario particularly prevalent amongst rural people whose daily subsistence depends on agricultural activities, and who are typically isolated from major communications media and decision-making processes. In these situations, officers take most of the decisions, at all levels, without pressure from the local populations. Because the central authority can penetrate more effectively into these arenas without increasing the influence of organised interests at low levels, they are much more likely to be pressurised from the higher authorities in their functions.

Political decentralisation, the prime expression of which seems to be popular political participation and empowerment, is an inter-organisational delegation of responsibilities and refers to the transfer of power occurring at the local level, where actors, institutions, or elected members become accountable to local populations. Typically, elections are seen as the mechanism that ensures accountability in political decentralisation. Usually, devolution or political decentralisation is considered the ultimate or 'real' form of decentralisation. In this case, responsibilities and financial

of expenditure responsibilities. Administrative decentralisation is greatly preferred over the other two types of decentralisation. The same reasoning applies to the reverse order of preferences of the sub-national governments: $P > F > A$. Their preference, first and foremost, is political decentralisation. If the president or head of state does not control the appointment and removal of governors and mayors, they can push forward the issues and concerns of their territorial units without fear of retaliation from above. If governors and mayors have to choose between fiscal and administrative decentralisation, they will choose the transfer of revenues over responsibilities, particularly if the unions representing the public sectors to be decentralised are large and strong. That is, sub-national executives prefer political autonomy, money, and responsibilities, in that order.

means are transferred to sub-national entities, which in turn have real autonomy in many important respects (Agrawal and Ribot 2000). There are numerous political economic, social and ideological reasons why governments pursue decentralised policies, but in developing countries, they are often designed with the support and pressure of aid agencies (Ribot 2002). Through devolutionary reforms, the central government confers or recognises self-governing capacities on local communities. Democratic decentralisation, which aims to increase popular participation in local decision-making, remains nonetheless an institutionalised form of the participatory approach. What is more, government and civil service become drawn into this type of decentralisation, enrolling involved community organisations, private sector stakeholders, international aid organisations and citizens who become conditional in this exercise. Therefore, local representativeness, the governmental character of responsibilities and institutional autonomy are all critical for local self-government. Increasing involvement of non-governmental organisations (NGOs) and community-based organisations in the management of local services may also be an instrument for decentralisation, a trend that has emerged since the 1990s (Olowu 2001a).

Political decentralisation, in theory, brings decision-making closer to the people and therefore delivers programmes and services that better address local needs. Stakeholders' voices and opinions are the main challenges in these decentralised reforms. Decentralisation can address poverty, gender inequality, environmental concerns, and the improvement of healthcare, education and access to technology. Increasingly, policy-makers and politicians are developing programmes to address citizen participation, promoting advocacy groups, incorporating women and the poor in policy decisions and aid delivery, to reduce poverty along with environmental initiatives at the local level, encouraging sub-national autonomy and creativity in addressing local needs (Work 2002). As democracy and local participation are key to these approaches, local populations empowered by local government representatives should, in theory, be integrated into better decision-making and be part of bottom-up processes through the transfer of power as conceptualised by policy-makers (Larson 2004a; Larson and Ribot 2004).

2.3 Decentralisation and its worldwide implications

At least 60 countries worldwide currently claim to have decentralised some aspect of natural resource management (Agrawal 2001). Out of 75 countries in the process of development, 63 are applying decentralisation measures (Selee 2004). Developing or transitional countries, mature and emergent democracies, autocracies and regimes with colonial histories are considering or attempting decentralisation. The general assumption is that mutually empowering relations between decentralised state institutions, private businesses and civil societies promotes liberal democracy and socio-economic development. Amongst the driving forces to decentralise are reformation of central government bureaucracies, related pressures to reduce public-sector spending, rapid transition toward market economies in some countries, increasing commitment to community-based forest management, and a growing concern for more equitable sharing of benefits. Another reason is the realisation that centralised forest management approaches, previously seen as a way of minimising governmental corruption, autocracy, repression and public-sector inefficiency, have been ineffective in protecting forest resources (Manor 1999b; Lai et al. 2000; Faguet 2000). Furthermore, as developing countries have since the 1980s faced severe financial crises caused by low levels of exported goods, increasing costs and rising energy prices, so decentralisation has seemed an appealing alternative solution to regulating limited resources more and a partial buffer against these growing problems (Rondinelli and Nellis 1986).

Since the 1990s, academic and development practice assessments of decentralisation have become less optimistic and more cautious, even pessimistic. The view that 'decentralisation is problematic' has become predominant. Thus, while Africa has the highest proportion of World Bank decentralisation projects overall, there is little evidence to show how they might be working. Decentralisation policies and programmes in Africa are designed more often as ideological arguments (which boost the supremacy of party, state or market) than on the basis of empirical facts (Olowu 2001b).

Analysts typically point to one or more dangers of decentralisation, such as increasing inequality, the empowering of local elites, political instability, and general ineffectiveness (Manor 2004). The progression of participation, representation, empowerment, and benefits for all and poverty reduction are compelling; but in many cases decentralisation has not gone much beyond initial or nominal empowerment. Background conditions (country settings, population density, state of infrastructures,

level of income, level of inequalities across regions) and processing conditions (social institutions, political power structure) for decentralisation, which represent important parameters for implementation, have often not been accounted for. While decentralised measures have been applied widely - from marine protected area management in Tanzania to development projects in South Africa, from natural resource management in Nicaragua to watershed management in Australia (Levine 2007; Cousins and Kepe 2004; Larson 2002; Fidelman 2008) – the problems that have been encountered remain numerous. These include lack of increased equity and social capital (Poteete 2004; Pretty and Ward 2001), representation and citizenship (Larson 2008), and conflict and corruption (Xu and Ribot 2004; Fisman and Gatti 2002), all plagued by contradiction, ambiguity, and perverse incentives.

Jütting et al. (2004) have noted that participation of the poor is unlikely in countries with a history of weak government accountability combined with low education levels, making it difficult to initiate pro-poor decentralisation processes. The inherited background conditions of the country and the process conditions of decentralisation can affect the impact of outcomes on poverty. Poverty has a negative effect on the ability to engage in formal political processes, mainly because there is a direct connection between basic literacy and ability to engage in political action. Therefore, participation in the political arena also depends greatly on the ability to obtain and understand information regarding laws, policies and attributed rights, and this requires the ability to read and interpret the meaning of documents (Johnson 2001). Moreover, traditional norms can either conflict with or, conversely, contribute to the participation of excluded groups. Political commitment at the national level, available financial resources at the local level, local social capacity and donor involvement in designing policies will all affect the ability and willingness to carry out reforms. The culture of transparency and information flow may greatly affect the outcomes for the poor. Therefore, the impact of the process on poverty will largely depend on the transfer of responsibilities down to the local level. The capture by elites of decision-making processes can result in negative impacts. Similarly, corruption may prevail if priorities and resources are diverted from poverty-reduction policies. For Jütting et al. (2004a), the outcomes will depend on major factors for which the motivations for decentralisation were sought for in the first place. For instance, if a government is decentralising as a strategy for overcoming declining budgetary resources or to manage, say, ethnic diversity, this will constrain design of the project. Consequently, the donors

could well impose these policies, or use them as a divestment of tasks to counteract insufficient resources or the lack of power. Conversely, a government has a greater ability and space to shape the process of decentralisation when the authorities believe in the benefits. In this case, socio-economic development substitutes for the mere provision of services that the local governments were procuring. This further emphasises the need for poor people to be properly represented in democratic institutions. Decentralisation must be tailored very carefully to the situation and may not be the answer to every problem (Ferguson and Chandrasekharan 2005).

2.4 Accountability and political articulation

Ribot (2002a) has written extensively on the key conditions for effective democratic decentralisation. In his view, power transfer and accountability are prerequisites. He sees accountability as a set of mechanisms and sanctions that can be used to ensure that policy outcomes converge with local needs, aspirations and the best public interest that policy makers can achieve. In this, he emphasises that the choice of local institutions and representatives is crucial to maximising equity, efficiency and justice. However, more often than not, rules and authorities in institutional environments are insufficiently robust to produce efficient solutions for resolving practical collective problems, but rather are designed and implemented to serve powerful interests (Ribot 2005a; Ribot, Chhatre and Lankina 2008). To this, Heuft and Buchenrieder (2003) add that the stronger the dependency of the relationship in the direct participation of bureaucrats in the exercise of power by the political elite, the more likely it is that they will reject any attempts to change the distribution of power. Chhatre (2008) stipulates that accountability of local governments cannot be conceptualised or dissociated from the accountability of other, higher institutions of representation and governance. He asserts that citizens are more likely to hold representatives accountable in an articulated political system⁴ that will enable communities to influence local institutions. For Chhatre, a disarticulated political system may reveal a majority of citizens who have

⁴ According to Chhatre, an articulated political system is one in which local actors can influence the political process through direct involvement. The opposite is a disarticulated political system whereby local actors cannot influence the political process. The orientation of political actors in disarticulated systems tends to follow authority and power, pulling upwards within the political hierarchy.

little or no direct influence on the political process. Conversely, articulated political systems provide the space and opportunity for actors to influence the political process through direct engagement. To illustrate this, Chhatre uses an example of an eco-development project in India in which a local party mobilised action against the project. This resulted in a conflict between two *panchayat* factions. Irrespective of which faction won the elections, elected representatives became burdened with the responsibility of bringing eco-development funds to the villages and this became instrumental in the consolidation of local democracy. Larson (2008a) cites a case study of two communities in Guatemala divided by two different parties. She suggests that in the process for greater indigenous participation and decentralisation, hired forestry officers who, although historically repressive towards the indigenous people, became totally involved in responding to local needs. She further highlights that what is more important in this context is not which institution become representative of the indigenous people, but how institutions become involved for representation.

2.5 Corruption

Decentralisation can serve as a vehicle for capturing and consolidating local elite power and influence, leading to the eventual seizure of the state. There is also the risk of expanding and further embedding clientelist networks and patterns of patronage politics. Indonesia offers a good example of the ambiguities of a major decentralisation reform. While the country experienced a revolutionary movement towards decentralisation after 1998, which has opened up new spaces for popular participation in political debate and for the watchdog groups in civil society, there has also been evidence of corruption associated with the process. This has increased inequalities between resource-rich and resource-poor regions. The central government has failed to successfully set and enforce minimum service standards in critical areas of national priority (Fritzen and Lim 2006).

Fiscal decentralisation is just one aspect of decentralisation where corruption is most likely to occur. In theory, decentralisation should assume the expansion of service delivery as users' needs become central to the attention of local authorities. However, this move is impeded as services may be overprovided to local elites to the detriment of non-elites in local governments. The extent of localisation and degree of fiscal autonomy of local governments may to some extent encourage this inequitable and inefficient cross-subsidisation (Bardhan and Mookherje 2006). What is more, because expenditures that are mandated from above could still appear in the budgets of local

governments and the task of measuring the effectiveness of certain forms of fiscal decentralisation is difficult, central government's corrupt officials might be resistant to fiscal decentralisation as it would attenuate their ability to extract bribes. Different spending programs may have different potentials for bribes, and this corruption might affect the composition of public spending. Agents may be more interested in allocating productive resources to bribery rather than production activities. In this respect, the level of both supply and demand determines the level of corruption. The higher the proportion of corrupt government officials, the stronger the incentive for an official to be corrupted and, in turn, the easier it is to find a corruptible official (Gatti, Paternostro and Rigolini 2003). In an economic world where individuals are increasingly seeking localisation and regionalisation of public decision-making to secure their interests, citizens are more likely to perceive a direct link between what they pay and the public services they receive. This may incentivise the exercising of control over public officials and hold them accountable for their actions (Shah 2005; Fisman and Gatti 2002a).

2.6 Land conflict

Encouraging a population to participate in the rule of law and the forging of democratic development also requires developing structures that can offer an effective means for the peaceful management of deep-rooted conflicts (Bächler 2004). As decentralisation typically involves greater local-level participation as a way of improving local management outcomes (Ribot 2003), it also entails agreements and disagreements amongst local people, state agencies, and other stakeholders. These may in turn awaken old conflictual situations or trigger new ones (Castro and Nielsen 2001). Brancati (2006) argues that ethnic conflict and secessionism are likely to be avoided when political decentralisation is in place and control over their own political, social and economic affairs has been surrendered to local groups. He maintains that political decentralisation is considered to attenuate and reduce ethnic conflict in democratic countries. This variable is greatly affected by the success of the decentralisation process in any given country. The task of reducing conflict may prove difficult in non-democratic countries, because their governments are more likely to jeopardise the jurisdiction of regional legislatures and mock the legislation they produce by installing regional politicians who do not challenge the government's authority. In this context, the process of decentralisation may, through the opportunities it offers, increase the strength

of regional parties and permit successful outcomes in regional legislatures that will in turn influence policies.

Quite apart from major ethnic conflicts, land agreements, ownership and equity (Palmer and Engel 2007) are often the root of disruption. Where land, forest and natural resources more often than not belong to the state (Yasmi et al. 2009), conflicts may arise regarding ownership and customary rights. Cousins and Claassen (2006) have illustrated the case of land ownership in South Africa, where the issue was clearly about distinguishing between 'western-style' forms of private property and 'customary' rights. They argued that the distinctive character of land rights regimes in the communal areas of South Africa arose from socially and politically embedded practices within historically specific contexts and conjunctures. Legal frameworks should vest land rights in the people who occupy and use the land, not in groups or institutions, while recognising that these rights are shared and relative within a variety of nested social units. The most appropriate approach to tenure reform is to socially recognise legitimate occupation and the users' rights as they are currently held and practised, whether or not described as customary. These can serve as points of departure for both their recognition in law and the design of institutional contexts for mediating competing claims and administering land. This is necessary to avoid the danger of abuse of power by 'customary authorities' or other structures, and to render administrative structures accountable to rights holders. These make them dynamic, evolving regimes within which a number of important continuities are observable. This view is compatible with Castro and Nielsen (2001a), who mention that conflict situations, regardless of their negative or positive character, can be used as constructive or destructive processes, but are nonetheless crucial not only for social change but also for the continuous construction of society.

2.7 Decentralisation can be successful

Decentralisation of natural resource co-management usually implies community-based management. Successful examples of this kind of devolution are hard to find, although some municipal or local governments may be no worse than central governments at managing natural resources (Larson 2002a). However, White et al. (2007) examine the role of key players - municipal, city and provincial governments in association with national government, NGOs, people's organisations, research institutions, bilateral and multilateral donor organisations - in the success of project implementation. To

emphasise this, they cite the issues of declining fisheries, mangrove and coral reef destruction and poverty among coastal communities in the Philippines and how they were tackled. A key lesson that emerged from the applied strategies for the implementation of the project was that even if programmes have sufficient support from national and donor organisations, implementation is not possible without acceptance, integration and participation of local dependent communities. Therefore, local support systems need to be both involved, and functional. For example, Pomeroy et al. (1998) reveal strong community-based management incentives from six case studies in Asia (Philippines, Thailand, Vietnam, Malaysia, Bangladesh, and Indonesia). They point out that although the planning and the implementation of co-management must be conducted at several levels, some conditions can only be met by the community's internal interaction while others require external assistance. The unique political, social, cultural, economic, biophysical and technological aspects of the different countries must be accounted for and viewed in the context of these complex interactions.

Heller et al. (2006) give further examples of successful local democratic developments building on the strength of civil society. In Brazil, a leftist party in an election was disregarded in favour of the Partido dos Trabalhadores (PT) or Workers' Party; the same happened in Kerala in favour of the Marxist Communist Party of India. Because these parties had favoured participatory reforms as part of an overall political strategy to strengthen the associational capacities of subordinate groups, the result was close collaboration with civil society and social movements. The strategy aimed to include social movements in the political process and encouraged the participation of local government. Conversely, although South Africa had a higher degree of state participation and a greater institutional, infrastructural and material capacity following the highly engineered forms of social and spatial control that Apartheid required, it nonetheless lacked Brazil's notoriety for penetration by political interests and municipalities. In contrast, the efficiency of local government remained highly problematic in both Kerala and Brazil, but the participatory institutions that had been built were sufficiently effective to address many of the obstacles to participation that are often ruled out in South Africa. Further, in Kerala and Brazil, institutional reform had a direct impact on building civil society capacities and providing subordinate groups with meaningful and consequential opportunities for shaping local development. Further work by Heller (2008) in Kerala demonstrates that a wave of far-reaching institutional reforms took place after an extensive critique of the inefficacy of insulated top-down

command, control bureaucracies and the array of both practical and normative problems, as well as the local participation deficit. Veron (2001) emphasises Kerala's failed community strategies - failure to include people's participation in addressing development priorities, to address future generations' needs, to settle conflicts between interest groups, to account for broader political, sociological and ecological dimensions. All the factors that were omitted in the old model were integrated in the new model. It then gained international attention as a good example of social development and environmental sustainability.

Balooni, Pulhin and Inoue (2008) have further demonstrated that governments can overcome the issues of land tenure and customary rights access. In the Philippines, the decentralised forestry sector and local forest management benefited from major government reforms. To achieve this, the Philippine government devolved some Department of Environment and Natural Resources (DENR) functions to local government units, encouraging their involvement in forest management. As part of this process, the National Integrated Protected Areas System Act of 1992 stimulated community participation by enforcing the delimitation of land boundaries and managing protected areas by local people. Further effort came from the Rules for Ancestral Land and Domain Claims in 1993, asserting the rights of indigenous people to their ancestral lands. In addition, the passing of the Indigenous People's Rights Act in 1997 provided for recognition of indigenous peoples' vested rights over their ancestral lands. South Africa's Makuleke community is another example of people's land restitution (Thornhill and Mellow 2007). The government's constitutional framework clearly required that the social, political economic and physical needs of all inhabitants be considered, and that any inequitable policies within a reasonable time frame should be met. The result was the *Restitution of Land Rights Act, 1994*, whereby in exchange for full ownership the Makuleke, who had been previously displaced, agreed to let the land remain part of the Kruger National Park, under the joint SANParks/Makuleke management control for 50 years. In the agreement, the Makuleke committed to maintain the land for conservation, and not use it for either residential or agricultural purposes.

2.8 External factors and decentralisation in Morocco

Decentralisation in Morocco has to be viewed within the wider context of the Maghreb region and its politics. The independent states of the Maghreb emerged at a time of decolonisation and the rise of a third-world movement as a factor in the Cold War between the Soviet Union and the West. In Algeria, Tunisia and Libya, strong tensions appeared following independence between the main anti-colonial political forces. Following these internal conflicts, North African leaders worried first about consolidating state control of society, and achieving economic take-off. In Morocco, a conflict over legitimacy between the independent Istiqlal party (founded in 1943) and the monarchy, both of which embodied the triumphant nationalist victory over colonialism, gave rise to the victory of King Hassan II. Thus was born the constitution that became the legitimization for monarchical power. In the 1960s, Morocco underwent a political strategy of voluntary development followed by the promotion of a national campaign in 1961 to lift the country out of its under-developed status. However, perhaps the strongest incentive to internal and external stability in the last twenty years has emanated from the rise of Islamism, a feature of the political evolution of all three countries of the Maghreb. The democratic transition of the central and eastern European countries during the 1990s following the fall of the Soviet Union provided a strong incentive for North African political openness coupled with increasing tension arising from radical Islam. Islamism and the Algerian political scene of the 1990s much influenced neighbouring countries. Threatened by the Islamic opposition and pressurised by the international community, the Maghreb region therefore sought a complex equilibrium that would bring internal and external security. The first years of the 21st century, the September 11 attacks in 2001, the invasion of Iraq by American forces in 2003 and the international community's perception that radical Islamism presented a threat, was all part of the creation of a new international context. Most North African governments tried, under international pressure, to reinforce their alliances with the US and the EU in return for political liberalisation (Elie 2008).

In 1990, the five southern European countries (Portugal, Spain, France, Italy and Greece) and five Arab Maghreb Union Members (Morocco, Tunisia, Algeria, Libya and Mauritania) met to launch a significant initiative to establish a security forum, with flexible structures for dialogue, consultation and cooperation. Regional, political, social and military issues were at the top of the agenda, as were increased cooperation for

political and economic interactions. For the first time ever, at the June 1992 Lisbon summit, major economic and finance issues were explicitly linked to matters addressing political liberalisation and human rights. Heads of state met again at Barcelona in 1995, when the EU and its Mediterranean partner countries engaged in an ambitious venture of increased economic, political and social cooperation, consisting of Euro-Mediterranean agreements and financial aid. Ambitions in terms of economic collaboration were especially high, aiming at a free trade area by 2010 (Kuiper 2006; Bernidaki 2006). The Free Trade Agreement would create an area of shared prosperity, fostering peace and stability on the EU's turbulent southern periphery. So far, Euro-Med agreements have been concluded with Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, the Palestinian Authority, Syria and Tunisia. In March 2004 the EU invited Libya to take an active part in the Barcelona process. Reciprocity is an important feature of the Euro-Med agreements.

US Free trade agreements have gained much political ground in the Middle East. Unlike Egypt, considered as a potential candidate for Free Trade Agreement only in 2003, Morocco has had a long history with the US. Both Morocco and Egypt have concluded an association agreement that will lead to free trade with the EU by 2012. For obvious geographical reasons, Morocco has preferred a close relationship with Europe rather than the US. Nevertheless, beside economic interest in the USFTA, Washington's primary objectives are also political. They perceive agreements as enhancers for the country's reform process, improvement of its institutions and governance, and stimulation of its economic growth. The threat of radical Islam has so far been limited in Morocco, compared to other countries in North Africa. It is believed that the improvement of social indicators is necessary for long-term economic development and to make Islamic militancy less attractive. Prosperity based on a market economy is seen as a political stabiliser, increasing the possibility of unfolding a fully-fledged democracy. This would in turn decrease the conditions favourable to the growth of terrorism, and help to convey an image of success, acting therefore as a catalyst for neighbouring countries (Galal and Lawrence 2007; Maasdam 2008).

The World Bank, UNDP and EU selection programmes for the allocation of funds require precise criteria to be met by the requesting country. Social development indicators in Morocco rank well below other countries at similar income levels. This became clear in a 1995 series of World Bank reports, which further blamed the education system, the administration, and the economic strategy of the kingdom.

Administrative structures were particularly targeted in these reports. Accusations included excessive expenditure for higher ministries, favouritism towards urban areas, and inadequate provision for education and health services in rural areas (Catusse et al. 2007). The World Bank has helped to raise the rate of economic growth, to reduce income inequality, and to extend social services to the poor through its assistance strategy since 1983. It has been the leading external partner, both in terms of financial support and in its economic and sectoral work, as well as through active policy dialogue on reform (World Bank Group 2001).

The conception and definition of governance formulated by international aid agencies differs from those of the World Bank. The World Bank stands primarily as a financial support organisation, which provides loans, guarantees, risk management products, and analytical and advisory services. The UNDP's remit on the other hand might be labelled 'democratic governance' and encompasses socio-economic and political dimensions of decentralisation. The UNDP has been developing a national programme on governance since 1996. Unlike the World Bank, whose main function is to lend money, the UNDP, present in countries that require assistance, aims to reinforce the instructional and institutional capacities of the requesting country. It assists in the design of policies addressing the issues that the country has identified (Charles et al. 2008). Therefore, to be eligible for funding, decentralisation has become high on the Moroccan political agenda and the UNDP has been assisting the higher institutions (Parliament, Supreme Court) of the country in developing a more comprehensive approach (UNDP 2008). Further, to reinforce the 'democratisation process', the UNDP has promoted the 'ART GOLD' programme, a strategy that explicitly targets the development of local governance and actors at all levels to further enhance the process of decentralisation.

The Moroccan government is clearly concerned with transparency. With its continuing reforms in the domains of financial auditing, the Moroccan constitution has provided for the creation of regional courts of auditors to be implemented as part of a UNDP programme. To stand as an example, the Moroccan Court of Audits is part of the INTOSAI⁵ Group, for which Morocco holds the presidency for the 2nd Committee on

⁵ INTOSAI. Part of the ISSAI group (The International Standards of Supreme Audit Institutions) whose aim is to state the basic prerequisites for the proper functioning and

‘Capacity Building’, that is as part of implementing the strategic plan of INTOSAI 2005-2010. It is at the Court of Audits level that the allocation of monies reaches the right administrations and regional accounts courts are responsible for control over certain budgetary actions. They may be called upon to give advice on the conditions of implementation of budgets of local communities and their groupings. The Court of Auditors is responsible for exercising greater control over the execution of financial actions. It ensures the regularity of revenue and expenditure of bodies subject to its control and monitors management standards. It validates any breaches of the rules that govern such operations.

Good governance, or rather ‘democratic governance’, has only become a major priority for the EU since 2000, whereas it has been a priority for the World Bank and the UNDP for over a decade (Fabre et al. 2008; Work 2002a). In the EU, a new development paradigm has recently emerged, a paradigm that symbolises a renewal of the ‘European consensus for governance’, the title given to the European Commission documents. The EU recognizes a more holistic approach and, for the first time, environmental protection and sustainable development have become key criteria for funding organisations (Charles et al. 2008a). In this, Morocco is a privileged partner of the EU. They both have a strong will to deepen their political, economic, social and cultural relations, as well as their security cooperation. The EU's external policy objectives are to promote better governance and effective promotion of democracy and human rights. Morocco fully shares this overall political vision, a vision that offers new political, economic, social and even cultural challenges. For Morocco, this rapprochement with the Union represents a fundamental foreign policy choice. As the country is pursuing the process of democratisation and consolidation of the rule of law, it is considered the most advanced in the region, and was among Mediterranean countries to sign the Neighbourhood Action Plan with the EU. Further, the legal framework for relations between the EU and Morocco came into force as the Association Agreement in March 2000. It calls for extended political, economic, social and scientific cooperation, as well as in cultural matters, together with the gradual creation of a free-trade area. More recently, the EU has been setting up a European

professional conduct of Supreme Audit Institutions and the fundamental principles in auditing of public entities (<http://www.issai.org/composite-188.htm>).

Neighbourhood Policy (ENP), which establishes a new framework for relations between the EU and its southern Mediterranean neighbours, for which the Agadir Free Trade Agreement was signed in Rabat on 25 February 2004, a model of economic integration in the region. In parallel with the Euro-Mediterranean cooperation process launched in Barcelona in 1995, the ENP treaty recognises the increasing interdependence between the EU and its neighbours in terms of stability, security and sustainable development. The ENP is designed to deepen the partnership based on common values, in order to implement the reforms necessary to create an area of prosperity and stability. The policy will allow the country to reinforce the strategic foundation of this choice, through the conclusion of reciprocal undertakings and the promotion of the regional and sub-regional dimensions, in particular in the context of the Euro-Mediterranean process (EU 2008; EU/Moroccan action plan 2008).

2.9 Early attempts at decentralisation under the Protectorate

Decentralisation is not a new policy in Morocco. The earliest attempts to decentralise go back to the time of the Protectorate. In the rural world, the authorities relied on the use of certain tribal structures. The traditional *jama'a*⁶ was recognised by Dahir (royal decree) on 21 November 1916 under the name 'administrative *jama'a*'. The number of members varied in relation to the size of the group. These were designated for three years by the chief of the region, subject to the agreement of the 'notable' of the tribe or fraction, in complete accord with the local regulating authority. *Caids* (official representatives of the Sultan) were in charge, providing information and opinions regarding the general interests of the group. These duties were performed in the name of the community or on a consultative basis.

The Protectorate aimed to preserve the traditional institutions that surrendered to the central power. However, these were modernised, leading the authorities to establish consultative assemblies in the first instance. Later, these structures were endowed with certain deliberative powers. To this effect, the Dahir of 8 April 1917 conferred a charter on each municipality. The management of each assembly was to be shared between the 'decentralised' authorities and the mixed municipal commission,

⁶ This is the traditional Berber tribal system that regulates and governs the internal administrative, legislative and executive functions over social and environmental matters.

composed of French and Moroccan notables, Muslims and Jews, designated by the Grand Vizier and put forward by the regional chieftain. Directed by the Pasha (lord), this mixed assembly was a purely consultative body. On the eve of independence, the French authorities, who hoped to balance the influence of the Moroccan and French anti-establishment groups, promulgated the Dahir of 6 July 1951, with the aim of enlarging the role of the administrative *jama'a*. These were therefore elected by the tax payers and were led by an elected president. However, because of the limited attributed powers of these groups, they were not permitted to move towards true decentralisation. The authorities indeed viewed these institutions as indispensable intermediaries, instrumental in pushing forward the acceptance of an economic, socio-political transformation justified through the necessity of discouraging rural populations from migrating to the cities to find work. Therefore, the concept of Protectoral decentralisation in Morocco was pursued as a preventive approach. The political contingencies required certain openness, but it was not in any way to be a transformation of local democracy truly based on authentic local interests (Chikhaoui 2000).

2.10 Post-independence decentralisation

Since the 1960s, Morocco has tried to respond to growing social pressures by devolving certain management and decision-making functions to the local level. It has favoured the development of local democracy for the last 15 years. This has been a response to the demands of Western partners, but also to the country's motivation to move away from a type of governance based on concentrated power at the national level. Further attempts to decentralise go back to the independence period and have been characterised by four stages. The first stage involved design of a new administrative architecture and introduced the elective principle at the level of the community councils, the adoption of the community charter (23 June 1960), followed by the creation of prefectural and provincial assemblies (Dahir of the 12th September 1963). In 1976, the reformation of community decentralisation endowed the communities with wider responsibilities to manage local matters. This decentralisation process restarted in 1990 with the creation of the 'region' and the division of administrative organisation into three levels: the region, the province, and the urban and rural communities (Dahir of the 2nd April 1997). Article 11, entitled 'Local Communities', of the revised constitution of the 13th September 1996, provides the basic text for decentralisation in Morocco. Although it

does not mention the word ‘decentralisation’, the Moroccan constitution allocates several roles to local communities, notably to underline their democratic dimension. The constitution specifies that groups contribute to ‘the organisation and the representation of citizens’ (article 38) and that they elect assemblies so that matters can be managed democratically’ (article 101). Paradoxically, three other texts occupy a central place: the Dahir of the 2nd April 1997 on regional organisation, the Dahir of the 3rd October 2002 that emphasises the organisation of prefectural and provincial communities and the Dahir of the 13th October 2002 regarding the community charter. From 2002, the process took a new dimension with the complete revision of the jurisdiction of local groups in order to reduce the role of the state. However, while sub-national authorities can exercise a number of legislative and administrative powers, the central government limits the resources allotted to sub-national units. In addition, the local entities have restricted autonomy in the allocation of their resources since they are under the authority of the Interior Ministry (Mami 2008; Work 2002b).

Decentralisation, therefore, remains so far a contained process. Governors, who are representatives of the state, execute decisions following the deliberations of the provincial, prefectural and regional assemblies. The provincial level placed under state control, has a central role as an intermediary. It is therefore difficult to engage in true decentralisation, even if elected bodies are supposed to affect it. Popular legitimacy of the provincial councils is practically nonexistent; their devolved powers remain overall symbolic. Furthermore, their financial autonomy, compared to that at the community level, is practically nil. The state has deliberately chosen to keep the provincial or prefectural level as an instrument of action for the central administration, a means to follow and control the exercise of community liberties, a centre of territorial power assuring the functions of political supervision and social framework. Therefore, despite its expressed will to bring into being an overall system, the state has failed to transform the province into an effective level of decentralisation. What is more, the region, the province and the commune perform the same functions that pertain to the territory, which the state delegates. At six years, the terms of the three assemblies are identical, but what varies is the way that they are selected. The members of the regional and provincial councils are designated by indirect universal vote, represented by local groups, professional chambers and employees. On the other hand, the community councils are elected by direct universal vote. It is at this level that the electoral and participative process is organised, which then serves as a platform for the functioning of

the other two types of local community. The communal level benefits mostly from political, juridical and financial reforms as opposed to the provincial level. It therefore carries the structural edifice. The communes have access to their own personnel, often diminished in their functions. The urban communes benefit from councils or districts and enjoy full autonomy to manage local matters (Zyani 2002).

2.11 Present day decentralisation

The Moroccan constitution explicitly addresses the role of local communities. The Moroccan government makes no distinction between the words ‘deconcentration’ and ‘decentralisation’. Nonetheless, the Arabic word *latarkiz* refers to the principle of decentralising but with the notion of coming back to the centre. However, it clearly emphasizes that deconcentration is not ‘delocalisation’ and that although the notions of deconcentration and decentralisation were opposed for a long time; they are at present not dissociated. Currently, deconcentration has become a corollary of decentralisation (El Yaccoubi and Harsi 2005).

For El Yaccoubi and Harsi (2005a), administrative decentralisation is a kind of local democracy. It aims to protect concrete rights: health, security, order, road systems, environment and social action. They acknowledge, however, that local communities do not control their resources and cannot implement their decisions; they must always refer to representatives of the state. However, by linking central power to the local decision-making process, the preliminary approval results in a true co-decision. The ‘new concept of authority’ that the Moroccan constitution refers to now logically implies the suppression, or at least a substantial and significant easing of the guardianship. It equally and especially asserts that local groups must benefit from better administrative and financial autonomy, and that it must be effective. Further, in this new concept, the state foresees a new conception based on the subsidiary principle whereby the construction of the state emerges from the bottom up to the summit. Although in future it will only interfere where local communities and civil society fail, it does not mean a total withdrawal of the state. On the contrary, the state calls upon local communities to privilege action. The state claims that the authority will consolidate decentralisation by fragmenting the decision-making power, strengthening local leaders’ capacity for taking initiatives. It further claims to develop the responsibilities of elected members, thereby contributing to the local economic initiatives prosperity and increasing action for civil society.

However, the government seems to agree that the thinking of 'civil servants' is in need of an overhaul and that procedural changes are required - necessary measures as officials tend to believe they have a monopoly on the public interest and are often inclined to consider themselves superior, forgetting their humble origin. This is particularly evident when public politics need to engage in a dialogue with disadvantaged, economically and socially marginalised sectors. Amongst its development strategies, the Moroccan government has implemented programmes to tackle the issues of poverty and exclusion. In the new communal charter, the government has taken care not to make too much of terms like poverty and precariousness. It seeks instead to develop a new consciousness that will embody the notions of solidarity, help and social re-integration, charitable and humanitarian action, help to people facing difficulty, illiteracy programmes, women's development and empowerment. The new 'decentralised' approach is seen as playing a vital positive role, complementing existing juridical instruments created by the state to tackle poverty.

2.12 Conclusion

Stimulated by incentives and initiatives from the EU, the US and by large investments from the Arab Gulf Emirates, Morocco, led by its enterprising new king, undoubtedly has a real desire for change. As the country has managed so far to stay afloat by meeting most of the criteria for the international donor organisations' political agendas, one of its biggest challenges remains the process of true decentralisation and its application, particularly where the lowest echelons of the population are concerned. Paradoxically, while viewed from above and through formal indicators, the country seems to be prospering and has managed to convey to the world an image of emerging democracy, the situation viewed from below (the village level) presents a different picture. The decentralisation process in Morocco is still largely an administrative exercise. As poverty is directly linked with the internal stability of any developing society, transforming political rhetoric, the good intentions of government and legislation in the area of decentralisation into effective development practice is a challenge that must be met if the historical institutions of the Moroccan state are to survive.

CHAPTER 3

The Geographic and Socio-political Context

3.1 Morocco: geographical situation

Morocco lies at the north-western corner of Africa (figure 3.1). Its territory covers roughly 446, 550 square kilometres, including the Western Sahara, and lies between 21° and 36° N latitude. The Western Sahara bounds the country to the southwest, Algeria to the southeast and east, the Mediterranean Sea to the northeast and the Atlantic Ocean to the west. It is the most mountainous country in North Africa. The Rif Mountains run parallel to the north coast reaching an elevation of 2,456 metres 'above sea-level' at Jbel Tidighine. The three Atlas mountain chains divide the country between the eastern plateaux and the pre-desert areas. The Middle Atlas, the most northern chain, extends from the northeast to the southwest and reaches 3,340 metres above sea level with Jbel Bou Nasser. The largest chain of mountains, which runs from the Atlantic coast to the east, is the High Atlas. The High Atlas has several peaks above 3,500 metres, including Jbel Ayachi at 3,737 m, Jbel Ighil Mgoun at 4, 071 meters, and the highest of North Africa, Jbel Toubkal reaching 4, 167 metres. Southwards, the Anti-Atlas Mountains extend from the High Atlas to the Atlantic Ocean. The pre-desert eastern plateaux and hamadas lie to the east and south of the Atlas Mountains, and rise to more than 1,000 metres above sea level. Marrakech is located in the middle of the country, just north of the Atlas Mountains, on the Haouz plain and south of the seasonal river Wadi Tensift. To the West lie the Atlantic plains of the Rhab, Chaouia, Doukkala and the Souss. The arid plains of Tadla and Haouz occupy the centre of the country. Because of its geographical situation, Morocco has a Mediterranean climate, with hot and arid temperatures during the summer season with low rainfall, and a mild rainy winter (Aulagnier et al. 2001).

Figure 3.1: Morocco and its political boundaries

Source : <http://www.moroccoemb.or.kr/morocco-map.jpg>



With a population of 34,343,220 million, growing at a rate of 1.6% per year, Arabs and Berbers combined represent 99.1% of the total. Islam is the main religion with Muslims representing 98.7% of the population, Christians 1.1% and Jews 0.2%. The country is divided into 15 administrative regions: Grand Casablanca, Chaouia-Ouardigha, Doukkala-Abda, Fes-Boulemane, Gharb-Chrarda-Beni Hssen, Guelmim-Es Smara, Laayoune-Boujdour-Sakia El Hamra, Marrakech-Tensift-Al Haouz, Meknes-Tafilalet, Oriental, Rabat-Sale-Zemmour-Zaer, Souss-Mass (figure 3.2). Arabic is the official language of the country. However, between 45-50% of the Moroccan population speak a dialect of Berber (Tarifit, Tamazight and Tachelhit), and are mainly concentrated in the Rif Mountains, the High Atlas and the Souss valley (El Aissati 1993). French is the language used for diplomatic relations, government and business.

infrastructural development. This prevents the country from fulfilling the preconditions for civil society. Clientelism and corruption advantage those who are socially, political and economically well appointed, and these factors jeopardise the chances of marginalised groups accessing better living conditions (Banque Mondiale 2007). A combination of Islamic law (Sharia) and French and Spanish civil law underpin the Moroccan legal system.

3.3 General economic conditions

Since the transfer of power from Hassan II to Mohamed VI in 1999, the Moroccan government has managed to bring macroeconomic stability to the country through the implementation of new economic policies. However, what it has not managed to do so far is to increase growth sufficiently to reduce unemployment, which amounts to nearly 20% in urban areas, despite ongoing efforts to diversify the economy. Morocco's GDP growth was 5.3% in 2008, after an economic recovery from a drought in 2007 that severely reduced agricultural output, and required wheat imports at rising world prices.

Poverty is still a major issue. Nineteen percent of the population live at the margin of the national poverty line, as set up by the World Bank at \$1.25 (Purchasing Power Parity terms, World Bank 2010), two thirds of these are in rural areas. Another 25% of the population live under the poverty line, in both urban and rural environments. Two and a half million rural children are illiterate, particularly girls, and 83% of the total population in rural environments are still illiterate. To overcome these major obstacles to development, 55 percent of the national budget is allocated to social programmes. To this end, the government launched the National Initiative for Human Development (INDH) in 2005, with a budget of \$100 million to address poverty, unemployment and the improvement of living conditions in the country's urban slums and most deprived areas. It is clear that basic infrastructures like water supply and electrification contribute greatly to human wellbeing even in populations having few other economic opportunities (Banque Mondiale 2007a). Further, the Moroccan government has opened the economy to international investors. Despite structural adjustment programmes supported by the IMF, the World Bank, and the Paris Club, the national currency (the Dirham) is only convertible for current account transactions. In 2000, Morocco entered an association agreement with the EU and a free trade agreement (FTA) with the US in 2006. The improvements of education and job

prospects for Morocco's youth remain long term challenges and the Moroccan government hopes to close the income gap between the rich and the poor by developing tourism, and by boosting competitiveness in the textile industry (CIA World Fact book 2008).

3.4 The High Atlas Mountains

Mountains, in Morocco as elsewhere, are a landscape providing major economic resources and ecosystem services. Mountain systems represent one-fifth of the world's land and are home to 570 million people. Mountain zones are also important suppliers of water, food, hydroelectricity, timber, other mineral resources and biological diversity. An estimated half of the world's population depends on mountain environments (Smethurst 2000).

Morocco possesses the largest mountain area in North Africa, broadly divisible into three parts with the following characteristics:

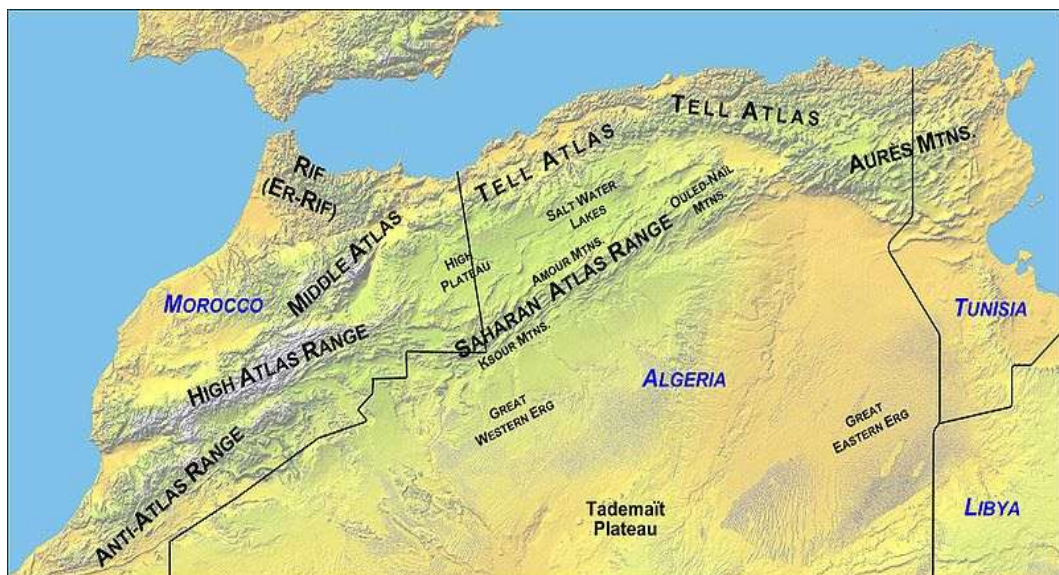
A: The Middle Atlas, which rises to 3,000 metres with an annual precipitation of 600-1000mm per year on the west side but decreasing to 300-500 mm a year in the east. These mountains form a major barrier between Mediterranean and Atlantic Morocco and the Sahara (figure 3.3), and are the location of some of the highest North African peaks, ranging from 700 metres above the permanent snowline at 3,300 metres. Season, altitude and rain precipitation largely determine the climate and can vary significantly in some valleys.

B: The Anti-Atlas, a plateau characterised by dissection, and situated south of the High Atlas, with an altitude ranging between 500 meters to 1,500 meters, and displaying a complex climate, with precipitation of 120-650 mm per year. The Anti-Atlas landscapes play a fundamental role in the Moroccan environmental system, protecting the country from dry, hot Saharan air, and collecting rain, which in turn feeds most of the streams, and main land water, which lowland and agriculture depend upon. Further, the Anti-Atlas provides much of the food grain, fibre and meat consumed in the country.

C: The High Atlas rises in the West towards the Atlantic Ocean and extends in an eastern direction as far as the Moroccan-Algerian border. An abrupt drop from the Atlantic to the southwest marks an impressive transition right up to the coast and the Anti-Atlas range. The Jbel Toubkal at 4,167 metres is the highest mountain included in this range and hosts the Toubkal National Park. The High Atlas is an

important barrier in the Moroccan weather system, preventing the pronounced Saharan conditions, particularly in the summer from influencing the Mediterranean climate to the north. This results in dramatic changes in temperature across the range. Snow falls regularly in the highest elevations of the range, which permits winter sports. Snow can last until late spring and is present mostly on the northern faces of the range. In this respect, the High Atlas represents the backbone of Morocco. An estimated 800, 000 ha of irrigated land are in the mountain regions, which can in turn support 30 percent of the population. In the High Atlas, traditional irrigated terraced agriculture can support up to 28 persons per square kilometres (Downs 2003; Barrow and Hicham 2000).

Figure 3.3: The range of the Atlas mountains in Morocco
Source: <http://en.academic.ru/dic.nsf/enwiki/762566>



From a human perspective, what makes the High Atlas so different from the Rif and Tell mountains in Morocco is the lower population: 4.5 million compared with 11 million in the Rif and Tell, and a low population density estimated at 20-60 persons per square kilometer (Maurer 1996:48). They represent a very important refuge for Berber communities. Although there is some migration to urban areas, population growth in the mountains is an important feature of human capital. The balance of natural resources has permitted these populations a degree of economic independence. However, living in the area has a number of disadvantages. These are related to topographic

compartmentalization, a very fragile environment and a lack of basic infrastructures. In this respect, the High Atlas demonstrates many of the 'poverty and livelihood' issues found among mountain communities generally (Crawford 2003). In particular, the communities are currently experiencing environmental degradation that is both a cause and a consequence of acute rural poverty (Rasmussen and Parvez 2002).

The study of mountain environments is not new but these have gained political prominence recently, particularly at the Rio Earth Summit conference in 1992. The United Nations Conference on Environment and Development (UNCED) provided a unique opportunity to bring mountains into global environmental consciousness with a specific chapter in Agenda 21 (Price 2004). Before this, the vast literature on the subject was mainly concerned with physical and ecological processes, and natural hazards, predominantly from a natural science perspective (Smethurst 2000a; Funnell and Price 2003). However, mountain environments also present unique political, economic and cultural features. Geographically, they often form 'natural' borders and frontiers between territories, and define political divisions between states and regions and between political units within a state. While geographical access and slow and precarious systems of transportation remain problematic, physical and political remoteness from central power and authority contribute to these communities' disproportionate political representation. Culturally, they stand apart from the lowlands, physical environment accentuating the boundaries between cultural groups. Mountain environments are difficult and complex areas to live in and often perceived as marginal by outsiders. These marginal social groups have limited options, which further encourage them to depend on local resources, leading to landscape degradation (Collins 2008). Marginality, therefore, both in a physical and socio-political sense, exacerbates poverty in these difficult zones and accentuates the importance of cohesion for collective self-help and reliance. What is more, limited accessibility and isolation increases the community's crucial dependence on natural resources (Jodha 2007).

The High Atlas serves not only as a border between Morocco and Algeria but also to separate traditional Berber communities from the rest of Moroccan society. However, the literature has barely discussed the broader social and political dimensions of mountain environments (Hewitt 1992). Smethurst (2000b) suggests a political ecology approach to these complex issues, while Schmidt (2005) emphasizes the need to scrutinize carefully the historical context in order to understand interaction between the local, regional, national and global levels of causation in these harsh environments.

Vayda and Walters (1999) are skeptical of the grand claims of political ecology. They stipulate that in order to explain the causes and effects leading to events and changes (in any ecological context), one has to work backwards in time and space to explain chains of events and changes rather than simply focus on changes of access at a wider political level. Thus, understanding the causes of poverty in such areas is not only a question of noting the lack of services that remoteness and outside-imposed resource constraints entail. It also requires recognition that it is sustained through multi-dimensional and culturally-articulated social networks which can only be explained by tracing chains of causation from the local outwards through a notion of 'progressive contextualisation'. Wellbeing, for example, does not simply depend on income but also on the feeling of integration and dignity (Rasmussen and Parvez 2002a), and this requires a local human perspective.

3.5 The Toubkal National Park: a biodiversity hot-spot

The Maghreb countries represent important biodiversity sites and important zones for the conservation of plant resources. In much of the developing world, it was the colonial powers who introduced the first parks to protect these resources and more recent post colonial administrations have copied the model. Both international conservation organizations and conservationist members of local elite groups have been responsible for institutionalising them. Portions of territory are allocated, and the state guarantees a legal status with a view to protecting the species, landscapes or resources contained within (Heritier 2010; Hayes 2006). There are now 162 sites with high biological diversity and identified for development as parks or reserves as part of a national conservation strategy. Created in 1942, the Toubkal National Park is the oldest and most protected park in Morocco. Two others were created at a later date, namely the Tazekka National Park in Taza province created in 1950 and Souss Massa in Agadir province created in 1991 (Lamnaouer 2002; Fennane 2004). Since then, the government has sought to create a further eleven parks. These vary between permanent hunting reserves, biological, botanical and private reserves. The Toubkal Park is set in 38,000 hectares of the central part of the High Atlas, between the N'Fiss valley to the West and the Ourika valley to the East (31°05'N-07°50'W). This portion of the High Atlas corresponds to what is known as Adrar n' Dern (Mountain of the Mountains). This particular zone displays the highest summits of North Africa. It is readily accessible, frequently explored and the most picturesque summit of the High Atlas. Seven valleys originate

from the Toubkal, with streams descending in altitude as they carry snowmelt water across various altitudinal zones and ecosystems, before reaching two major river basins, the Tensift and Souss. The Toubkal National Park possesses some special characteristics. Geomorphologically, the torn sub-horizontal crests, offering abrupt relief, are made of old eruptive acidic materials where andesites, rhyolites and slab are present. Its northern flank displays a zone of high permotriassic plateaux constituted of sandstone and clays. The principal summits of the park, situated on the line dividing the watersheds leave towards the east: the plateau of Tazarhart (3,995 m), Ouenkrim (4,089 m), Toubkal (4,167 m), Tichki (3,753 m), Azrou Tamadout (3,664 m), Aksoual (3,910 m), Bou Iguenouane (3,882m), and Ineghmar (3,892 m). Many permanent rivers have their origin in the park area, and ensure the irrigation of the valleys and the plains in the piedmont. On the northern flank, the main rivers are the N'fiss, Rherhaya, and Ourika, with the Souss on the southern flank.

Climatically, the geographical position of Toubkal confers special characteristics. The climate shows considerable diversity, with bioclimatic zones ranging from semi-dry temperate to fresh, as well as humidity of the fresh type. In this environment, snowfall plays a very important role. From a botanical perspective, all levels typically offer Mediterranean vegetation with the exception of the Infra Mediterranean. The latter is mostly present in the north piedmont of the chain. It contains one of the highest concentrations of endemic species in the Mediterranean basin. Therefore, successive vegetation layers are present as altitude increases. These include the Thermo Mediterranean typically characterised by populations of green oak (*Quercus faginea*, *Q. ilex*) and thuya (*Tetraclinis articulata*), and herbaceous plants such as hemicryptophytes⁷ of the Oromediterranean type at the highest zone, and other ecosystems with red juniper and Spanish juniper (*Juniperus thurifera*) to cushions of thorny xerophytes. Smaller vegetation groups valuable from a biological, biogeographical and ecological viewpoint are an addition to these types of ecosystems. The combination of colonising pozzines⁸, cliffs and rocks and riverbanks is responsible for the especially rich endemic Moroccan flora, typical mountain plants, presenting

⁷ Hemicryptophytes are plants whose perennating buds are at ground level, the aerial shoots dying down at the onset of unfavourable conditions (Allaby 1998).

⁸ A pozzine is a water hole. They are connected by natural canals dug by the flow of melted snow and are covered with large meadows.

elements belonging to the Euro-Siberian flora. In terms of fauna, the Toubkal is distinguished especially by the presence of the oldest population of wild mouflon or Barbary sheep (*Ammotragus lervia*) in the Takhehort reserve. Avifauna is very diverse, with almost 100 species, including three eagles: the royal eagle, Bonelli's eagle, and the white eagle. The herpeto fauna also displays a rate of high endemism with some very rare species, such as *Psammodrome microdactyle* and the Schokar grass snake (*Psammophis schokari*) (HCEFLCD; CHM 2008).

3.6 Historical context

The *Berber* people are the precursors of the Arabs in much of North Africa. Their origin goes back to antiquity and they have been identified speakers of the Lybic language from which ancient *tifinaghs* (Tamazight script) was derived. They are widely found in regions that are totally Arabised today (Camps 1980:24). From the 12th century BC, Berber areas were subject to a series of foreign settlements and invasions. The Phoenicians established trading posts along the Moroccan Mediterranean coast. After the fall of Carthage in 146 BC, the area was allied to Rome and incorporated into the empire as the province of Mauritania. In the 7th century AD Arab armies spread Islam across North Africa and southern Spain. However, Arab power was fragmented and an independent dynasty governed Morocco and Muslim Spain. The Arabic and Berber populations of North Africa, united by empire and religion, began to mix, and the blurred distinction between the two ethnic groups continues to the present day. Both Berber and Arab dynasties ruled the Moroccan empire until 1649 when the Alaouites, an Arab dynasty, established itself as the ruling family (Downs 2003a).

The subjugation of Berber populations was not an easy task. As a punishment for resisting the invaders, they were enslaved. At the time, they were considered pagans. Barbarian, the term that the Romans applied to this miscellaneous gathering of tribes who spoke this incomprehensible dialect, became later 'Barbar', an Arabic cognate of the Greek 'Barbar' meaning not anyone educated enough to speak Greek. The Romans used the term to cover anyone they considered uncivilised. However, once fought and conquered, Berbers had to submit to the Arabs and were obliged to accept Islam. They became increasingly Muslim without speaking Arabic, and the Madhi of the Almohads preached in the Berber language. The Arabs then elevated the Berbers to the status of a 'great nation' and for the first time, they were identified as a people and a race. Arabisation, not to be confused with Islamisation became widespread throughout North

Africa but quite independent from the faith. While the popularity of Islam ultimately reached the lower classes of society, the further away into the south and west of the country, and the further into Berber territory, the more the literate spoke Arabic (Brett and Fentress 1996:124).

3.7 The French Protectorate

The Berber people have a long history of attempts to occupy their land. In the period between 1912 and 1956, General Louis Hubert Gonzalve Lyautey had the task of pacifying Morocco. Lyautey was known and chosen for his strategy of defeating tribes with little cost in human lives. In real terms, this meant not disturbing the local populations, leaving them with their civil rights and their rulers, whether kings or governors. As we have seen, Berbers at an earlier stage in their history had been the victims of Arab invasions, which had attempted to impose Muslim law through the *Makhzen*. For Lyautey: ‘The secret of my conquest has been to protect the Berber in his private life against external intrusion, in his traditions and customs of the clan’ (Bidwell 1973; Vinogradov 1974). In 1930, as part of a strategy to divide the country in order to better rule it, the French⁹ introduced the Berber Dahir (Royal decree), which drew a clear demarcation between Arabs, the Islamic urban Atlantic plains and the tribal Berber in the High Atlas. This was achieved in two ways: on one hand through recognition of *Imazighen* (free men) based on local customary laws, and on the other hand, through the Arabised institution of ‘Sharia’ law (El Aissati 2001). This encouraged the retention of a strong Berber identity, and keeping Berbers separate from Arabs.

Although Lyautey’s prime concern was to protect the tribes from European influences, to which end he restricted access to whole areas such as Souss, he did not manage to stop the turmoil that brought unrest as the *Makhzen* attempted to modernise the country between 1900 and 1912. The tribes perceived this as a threat to their

⁹ Although Lyautey was to remain faithful to his role of pacifier in Morocco and respected the conventions between the Sultan and the French government, he was not ready to hand over Berber populations to the central government, the *Makhzen*. By stipulating that it was France and not the *Makhzen* that had conquered the country, Lyautey’s intention to create Berber politics based on the traditional laws, language, and social organisation was quite clear (Bidwell 1973:38).

freedom, particularly with the increased tax demand that the authorities tried to enforce (Burke 1973). At a time when the *Makhzen* only had a rudimentary administration at the beginning of the 20th century, the French installed a bureaucracy which privileged a hierarchy of interested parties, close to the ministries in the metropolis, including viziers, directors, sub-directors, principal private secretary, and section chiefs. In this, institutional and colonial interests, as well as actors from the colonial system dominated the exercise of central power (Hibou 2006). The power of the state in rural areas increased as the central government collaborated with rural nobility during the colonial era. The Department of Water and Forestry proceeded to the acquire land and handed it down to the local caids and sheiks (Davis 2005). These rural nobles therefore acquired large areas of land to the detriment of peasants. They became collaborators with state authorities and members of the district council. In some cases, as in the Middle Atlas with the Ait Abdi tribes, the local Berber work force (the *tuiza*) was used as forced agricultural labour (Venema and Mguild 2002:106). These nobles still participate today in the patronage network that permeates the state (Hammoudi 1997). As the colonial government involved the local authorities in policy implementation, the Department of Water and Forestry brought all non-private lands and resources including former *bled al Siba* areas under state control (Venema 2006). The 1973 agrarian reform that promised to return the land to the rural peasantry failed to materialise (Hammoudi 1997a). Berber tribes always maintained their own form of socio-political organisation with no interference from the state, so long as they paid their taxes and could provide troops whenever required by the Sultan or central government. They have long existed in a perpetual state of ‘institutional dissidence’ (Gellner and Micaud 1972).

3.8 Caid

Caid is a term applied to various officials, whose function was to represent the Sultan. The Sultan appointed a person either as a caid from the *Makhzen* in which case, his main functions was as a military commander of the tribe or as a civil governor responsible for the security of his territory, a judge for criminal matters and a tax collector. Caid in the Bled *Sida* (lands of chaos and rebellion, as opposed to those held by the *Makhzen* (Montagne 1931), were of two kinds: passive characters appointed by the Sultan and installed by a *chorfa* (sheriff), who usually went about his business, keeping a low profile. The second type was an effective ruler of the tribe positioned either through heredity or self-appointed (Bidwell 1973a). Under the French

protectorate, a handful of these nominated 'grand caids' were recognised and ruled over the High Atlas south of Marrakech, between the Haouz plain and the Souss valley, without any interference from the colonial authorities. Some of these grand 'caids' (feudal lords) such as the Glaoui brothers (Glaoui Pasha) expanded their territory by force and managed to subjugate neighbouring tribes. By 1934, all the tribes were under the control of the Makhzen and the caids had played a major role in achieving this (Wanaim 2005).

For a long time, the sedentary tribes in the Agoundis were very informally constituted without any stable socio-political or economic structure (Benaboubou 2004). According to Benaboubou, the tribes appeared in the 19th century formed through an alliance of *taqbilts*¹⁰ characterised by the *leff* (a moiety system typical of Berber tribes). However, there has never been a generic name to describe the tribes in these mountainous zones. The inhabitants of the Agoundis valley became the Goundafa tribe. This name was attributed in the middle of the 19th century (Montagne 1930) under the reign of the caid Si Ahmed Ait Lhacen of Tagoundaft. He ruled over the Agoundis with tyranny and instituted the political status of Gondafi. After his death, the caid's sons Mohamed and Tayeb inherited the title and took over power. Crawford (2001) says that no one in the valley would consider himself/herself Gondafi and that the Agoundis people were primarily political subjects. The inhabitants of the Agoundis were therefore described using the name *Gondafa* on French tribal maps, even though there was nothing authentically tribal about this denomination, at least not in terms of lineage. In the light of this history, the local people of the Agoundis recognise three political eras during modern times: the period of the Gondafi caids, the period of the French caids and the period of the present day caids assigned from either Rabat or Casablanca. Although each period has seemed to be an improvement over the preceding one, all were typified by authoritarianism. Since independence, the region has submitted to the authority of

¹⁰ The *taqbilt* is a political unit (tribe, fraction or district) based on a number of villages (*douar*). A *douar* is a spatial and socio-economic unit that contains a rural population. In most cases, families within a *douar* have tribal connections. It allows the population to provide for their basic needs. According to Montagne (1930), the *taqbilt* is a gathering of *douar* on a common territory. The Arabic *qaba'il* (sing. *qabila*) for tribes is equivalent to Berber *tiqibin* (sing. *taqbilt*) (Hart 2000).

caids from military backgrounds (and kept in reserve in case of conflict), supported by *cheikhs*¹¹ and *moqqadems* (informers), the latter usually of local origin (Faouzi 2005). More than a century later, villagers of the whole valley still react with apprehension when faced with this authority structure. They have to pay fines if caught collecting natural resources without authorisation by the Guardian of the Water and Forestry Department. Besides, the *moqqadem*, being a local person, patrols the villages in his second role as postman and in this way gathers intelligence that he reports back to the local *caid*. Under these conditions, people are constantly held in check and any independent initiatives or movements are well scrutinised from a distance. Whenever local people want to take any personal or communal initiative, they first require permission. The local authorities claim that what motivates this is the security of the region, but such a regime of social control creates a situation whereby the inhabitants of the valley dare not take initiatives, knowing that these will most likely be blocked by officials. This in turn feeds the fear of reprisal.

3.9 The suppression of Berber culture and identity

As we have seen, the literature on North Africa indicates that the indigenous people of the Maghreb are the Berbers or *Imazighen*. Chaker (1987) points out that Berber identity emerged long before the contemporary area. It is neither the creation of Arabo-Muslim nationalism, nor the creation of colonization even though France did play a major role in its institutionalization. The royal decree of 1930 (Dahir Berbère) was signed by Mohamed V, stipulating that Berber rural areas could be governed through their customary tribal law system (El Aissati 2002). Thus, the French institutionalized the distinction between Berbers and Arabs as a tool of colonial rule (Maddy-Weitzman 2001). The biggest change came at the end of the 19th century, particularly in Kabyle (Algeria), with the emergence of a Berber discourse and self-image. Previously to this, Berber community consciousness mirrored a system of traditional references to tribal relationship networks, a literate tradition, notably with poems particularly in Kabyle; and also through local saints and tribal confederations. In the course of the 20th century,

¹¹ Historically *cheikh* or *amghar* and *caid* were part of the Berber tribal structure. Today they hold government positions; the *amghar* remains a local figure, and the *caid* an outside bureaucrat.

the essential reference for Berber identity became the language and awakened a Berber global consciousness. Through historical, ethnological and other research work, the Université Française in Rabat spread the knowledge of Berber culture (Ouerdane 1987).

Currently, language and culture contribute to the revival of the *Amazigh* movement. Language, being crucial to group identification (El Aissati 2001a), the ethno-linguistic vitality of an ethnic group is central to the survival and continuation of the group (Giles and Johnson 1987). Today 40 to 50% of the total population of Morocco speaks one of the three dialects of Tamazight (Tarifit in the North, Tamazight in the Centre and Tachlehit in the Souss). The concept of Tamazgha (the land of the Amazigh) is central to the discourse of Amazigh activists. International websites, newsletters and forums readily available on the Internet have further amplified this movement. These address debates regarding the place that Berbers occupy today in the Maghreb's history and society, raising further Berber consciousness (Crawford and Hoffman 2000). In order to restore *Amazigh* culture as part of the national heritage, the Moroccan government created the Royal Institute of the Amazigh Culture, Institut Royal de la Culture Amazigh (IRCAM) in 2001. This royal decree indicated a dramatic u-turn in its attitude towards Berbers. It advocates the integration of Tamazight (Berber) language into the education system. However, as Crawford (2008) points out, it should also examine important debates such as the deep historical roots of Berber politics in Morocco, Amazigh regional diversity and how the notion of 'Berber-ness' is included in the politico-economic conditions that unfold with the application of the Dahir. The effort of maintaining the language in Morocco is strongly linked with an ethnic revitalization. It should remove the stigma of speaking Tamazight and encourage its recognition, as well as the Berber heritage and culture more generally (Hoffman 2000; 2006).

Moroccan standard Arabic (MSA) and French remain, however, the official languages (Sadiqi 2008). Generally perceived as the 'elitist' civilised language because of its affinity to religion, MSA is the spoken language of government and administration. Despite the promise to introduce Tamazight into public arenas as well as in education, it together with Moroccan Arabic (MA) are perceived as 'backward', 'low' and 'indigenous' languages. And, of course, language is not only a mean to communicate but also embodies the essence of the culture of a people symbolizing identity and continuity. It therefore becomes a tool to exert control and political power (Miller 2003).

3.10 Social organisation

Gellner (1987) has claimed that Berber social organization is based on the notion of segmentarity, a statement contested by Crawford¹² (2005). Benaboubou (2004a), however, points out that ‘beyond a common biological identity and a sense of brotherhood’ connected to a common descent, the lineage often politically represents the community, governing collective rights of access and use, for example water, particularly in conditions of scarcity.

The households, known in Tachelhit as *takat* (literally ‘hearth’) is the most basic social unit, sometimes composed of several nuclear families. It is split symbolically into parts, which bear the names of organs such as *amazough* (ear), *igomma* (mouth), *n’fous* (soul), terms applied to individuals within the *takat*. Takat are grouped together into patrilineages, and lineages into clans which in turn are grouped to form tribes and confederations of tribes. The tribal configuration is based on the notion of *ighs* or *iks* (plural *tikhsept*) meaning ‘bones’, and implying a common patrilineal ancestor. In general, every lineage living in a *mouda* (three to four hamlets) of the *taqbilt* is represented by the council and recognised by others as socially autonomous units (Mahdi 1999). *Ait* or *Id* usually precedes the name of a same lineage, a denomination that identifies the villagers’ origin.

Among the tribes in the High Atlas, a hamlet (*tadchert*) is generally composed of three lineages comprising five to fifteen households. A fraction, district, or small tribe (*taqbilt*) includes four to five *mouda* on the northern slope and two to three *mouda* on the southern slope. A tribe not qualified with any specific name is designated by its proper name and may consist of between three and twelve *taqbilt*.

The institution of *leff* is another feature of political organisation important in the region. As a rule, the *taqbilt* is divided in two *leff*, which provide, needed a strong leverage for social cohesion. Originally, the *leff* were utilised in times of conflict and war, a *taqbilt* calling upon its neighbours for solidarity in opposition to *taqbilt* of the

¹² Crawford (2005) argued against this, noting that on the basis of the allocated *caids* of the 19th Century, there is nothing politically segmentary in the Agoundis valley. He further emphasised that the only segmentarity that may be applicable amongst the Berber in the Agoundis was to create a sense of fairness because there existed inequalities in the structure of the groups themselves.

opposite *leff*. However, these types of conflict, rarely involved more than four or five districts. In peacetime, collective festive demonstrations such as of the *tinoubga*, the sacrifice of a cow where meat is divided and consumed in a communal meal symbolising membership of one *leff* or the other.

According to Benaboubou (2004b), lineages in the Agoundis are usually associated with a single hamlet, are rarely present in several, and never in several *mouda*. This situation is unlike that found in Arab settled lineages or among migratory Berber pastoralists of the Middle Atlas. Table 3.1 indicates the diversity of lineages comprising the *douar*. The same lineage, Id Bougrri and Aït Ouakrim for instance, can be found in Angzdm and Agadyr n'Inemzal, Aït Well ouchen in Taghorghist and Tazoughart and Ihoulyn in Tarbat and Dar Laskar.

In the Agoundis valley, several lineages are spread over a number of villages. At the level of an elementary irrigated hamlet (*tadchert*) garden terraces of families belong to the same lineage. These are dispersed over one or more irrigation neighbourhoods, because of successions and fiscal obligations. The fiscal situation is minor because of the small size of the land exploited. The average size of a plot of land is 0.07 ha, 80% of the land owned on the *melk* (private) status. The mode of property transfer is direct and concerns 90 % of the population.

Table 3.1: Lineages found in the Agoundis valley
Source: Benaboubou 2004

Douar	Lineage name	Number of lineages
Angzdm	Id Bougrri ; Aït Ouakrim	2
Agadir n'Imenzal	Id Ba'rour; Id Bougrri; A`t Ouakrim	3
Toundafine	Aït Lhaj; Aït Telouat; Aït Ablla; Aït Bouqdyr; A`t Jouttan; Ait Mohamed	6
Aït Youb	Aït Talmouddnt; Aït Lqadi; Ijourar; Aït Mrghdin; A`t Talb Ali	5
Addqqi	Aït U Hsaïn; Id Ablla	2
Agrada	Aït Ouakrim; Nnaouda; Igouzouln; Bouissramn; Aït Chibha; Ihahan	5
Aït Moussa	Id Berdouz; Ibnnanïn; Aït Youss; Aït Lhaj	4
Amsslan	Aït Abslam; Aït Hmad; Aït Abderrhman	3
Anammr	Id Uhmd; Irjdaïn; Idghoughn	3
Taghorghist	Irbbouzn; Id Baj; aït Ben Ouchchen; aït Lkstaf; Id Zddou	5
Ighir	Id Bazzi; Id Ben Ali; Id Omar	3
Tazoughart	Id Ouissadn; Ilgjan; Id Moulay; Aït Ben Ouchchen	4
Tijrichte	Igouzouln; Id Mansour; Id Lmouddn; Idkarn; Ikhrrazn; Imziln; Id Boutiddi	7
El Maghzen	Id Abdelkrim; Ait Lyazid; aït Saïd U Mansour; Amrdou; Id Boussalm	5
Tarbart	Aït Daoud; Id Ouakrim; Id Fars; Id Lmouddn; Ihoulyn	5
Dar Laskr	Ihoulyn	1
Tagdite n'Oufla	Id Hida; Ibnaïn; Idrassn; Id Ben Hsaïne; Aït Ablla U Lahcen; Bounlli; Bouftou; Aït Ilarzg	8
Tagdite n'Izdern	Boudgwig; aït abllah U Braïm	2
Mejjou	Id Boubkr; Ibhryn	2

Identifying the composition of lineages within a *douar* (village) is important as it distinguishes those households belonging to a lineage identified as *Assl*, from more recently settled households. It also permits observation of the method of distribution of the same households spread over different *douar* and the solidarity networks that this permits. Lastly, it allows us to understand the lineage composition of the *douar* by class according to their status *igourramn* (saints), *chorfa* (sheriff) or commoners. Economic capital and social position determine the ability of an individual to occupy a role in decision-making processes and the influence that individual may exert. Those who have an influential position through individual achievement are called *ikhfaoun n'lajmaa't*, literally the brain of *lajmaa't* (Madhi 1999a) and may take decisions on behalf of the community. As Benaboubou (2004c) notes, knowledge of composition is essential in the context of development planning and in understanding development impact.

3.11 Jama'a

The ancient system was composed of the cantonal *jama'a* of the elders in the *mouda* (group of hamlets), formed by representatives, usually the heads of households (Montagne 1930a). The *jama'a* is based on oligarchies or small political and administrative entities on a given limited territory, composed of *amghar* and *taqbilt*. Following a succession of minor revolutions, most of the tribes in the high mountains rejected the oligarchic system. They opted instead for the more active and flexible government of the autocrats, the *amghar*. The village *jama'a*, in fact, comprises two councils, one consisting of a small group of elders representing each lineage in the village, and another, a larger body where a male member represents the household.

Madhi (1999b) has described the *jama'a* (*lajmaa't*) as a territorial unit comprising one or more *douar* (villages) spreading its control and jurisdiction over its territory. The *jama'a* is composed of between three and ten or more lineages. Madhi further emphasises that the *jama'a* is formed by those who recognise, and indeed are recognised by the community as acting for the common interest of all, on both a material and spiritual level. It is a vital body regulating administrative, legislative and executive functions over social and environmental matters. Montagne (1930b) identified it as the 'Berber Senate'. In the past, as today, people refer to it and follow the directives regarding land access, whether land is used as collective pasture or not (Venema and Mguild 2002a:109). The meeting point in each village is the mosque (*timzguida*) and male representatives of the households discuss matters informally usually after prayer

on Fridays. This governing body played a vital role in resolving disputes and mobilising and ensuring the regulation of collective work. It is also a vital element in keeping together different lineages, households and other village members for work in situations where survival entails cooperation in a particularly harsh environment. Conflicts are resolved within this structure. In the past, people would resort to the local *caid* only if matters could not be solved at the village level. What is more, the *jama'a* is a crucial element in the distribution of water and pasture rights. It regulates the *agdal system* (Dominguez et al. 2011), in which water reservoirs are allocated to lineages. These provide water for the land belonging to *takatine* (plural of *takat*, the family unit). Sluices control the flow of water and, if necessary, people can call upon the *tuiza* (a collective work group particularly for agriculture) for help. Nowadays, the *jama'a* has been adapted to serve as an official association in some villages, similar to a community-level, non-governmental, organisation. The transfer requires a series of bureaucratic formalities entitling the old *jama'a* to acquire the new official status of *jemai'a*. The authorities encouraged this change to facilitate cooperation with other outside organisations such as development agencies (Downs 2003a). The *jemai'a* in the rural commune of Ijoukak therefore comprises all the villages within the Agoundis valley.

3.12 The Agoundis valley: geographical characteristics

Owing to its topographic and geographic position, Agoundis is one of the narrowest and enclaved valleys of the High Atlas (figure 3.4), enclosed between abrupt forested slopes, and offering very little cultivable space. The duality of this spatial structure produces noticeable differences in the landscape and in the availability of resources. However, these harsh and fragile environments are more often than not heavily settled. The strong declivity of the slopes favours the streaming and erosion of the ground, thus necessitating the construction of terraces. Because of the altitude ranges, local families have traditionally diversified livelihood strategies according to the seasons. With the integration of terrace agriculture in the landscape, local populations have managed to subsist on diversified rotation agricultures (Barrow and Hicham 2000a). Millennia of human modification have shaped the typicality and diversity of these landscapes to control erosion and to promote agriculture. The Agoundis valley has, therefore, access to a remarkable anthropic landscape (Gerbati 2004). Farming takes place in terraced fields cut into the steep valley sides. For centuries, the villagers of the High Atlas have

practised a mixture of subsistence cultivation and pastoralism. Nomadic seasonal transhumance was very common up to the 1950s between natural low and highland pastures. Herding is now mainly sedentary, involving small flock of grazing goats or sheep. It takes place during particular periods, especially in the higher pastures of the valley, and is often supplemented by the addition of fodder harvested from the garden or the mountains, or even with hay when villagers can afford it (Bourbouze 1999).

Figure 3.4: The Agoundis valley.

Source: Centre d'Etudes Spatiales de la Biosphère, IRD 2009



According to the 2004 census, the population of the rural commune of Ijoukak was 6,641 inhabitants representing 37 *douar* or villages along the whole valley (HCP 2004). This is divided into three fractions (tribes); the fraction of El Oued accounting for an estimated 2,668 inhabitants and 421 households, the fraction of Tamaste accounting for 234 inhabitants and 50 households, and the fraction of Agoundis which is that most relevant to here and which has 3,403 inhabitants and 522 households. For the purpose of the study, however, eight villages are referred to: Ighir-Tazoughart, Tagdite n'oufella and n'izdern (high and low) and Mejjou, Tenfit, Tijrichte, Ijoukak and

Tarbat and the central village of El Maghzen, where the project was based. There is evidence that the population is declining in the upstream direction compared to the downhill direction. This seems to reflect the location of more important resources (e.g. assif Aït Ahmed forest), better communication (e.g. high altitude trucks) and better access to water, particularly snowmelt in the downstream areas. All these conditions make the Agoundis valley a suitable site for traditional cattle rearing and further enhance the implementation of high mountain production systems such as pasture, transhumance, agricultural and arboreal activities in the lower valley.

3.13 The Agoundis valley: socio-economic characteristics

The High Atlas communities demonstrate many of the ‘poverty and livelihood’ characteristics found among mountain communities. Households living under the poverty line represent 31.6% of the total and the number of households considered vulnerable represents 25.4% of all inhabitants. In these terms, the Agoundis valley is one of the poorest segments of the Moroccan population and this is reflected in literacy levels, infant mortality, availability of potable water and other development indicators (Russell 2004). With its relative inaccessibility, small population, and a subsistence economy based on mixed farming and local natural resources, villagers manage to sustain themselves, focussing on barley, almonds and walnuts in terraces of carefully irrigated fields. Forests provide wood for cooking, construction, and heating, as well as forage for animals. Water management and irrigation is both very fragile and complex (Crawford 2003; Saxena et al. 2001). During the summer season, when temperatures can reach over 45 C and the river is dry, water is scarce, especially if rainfall has been low during the winter months. In this case, water has to be collected from the river in containers. To provide for cattle, women have to spend many hours daily collecting fodder. The winter season can be difficult as there is no food for the animals. Women will resort to gathering fallen walnut leaves. For baking bread (*tanourt, arum*), wood collection is essential and requires long hours spent high up in the mountains, not without any risk of accident, as people sometimes have to climb up mountainsides to cut the wood. Women predominate in agriculture and in collecting vital resources such as wood and fodder.

Household cash income is low, partly provided by outside members of the family who are in employment and live in the cities or further away. Resources such as almonds, walnuts, carob pods and aromatic plants are traded to generate income. Individual households and their family connections will often break almonds and walnuts together so that the head of the household can take the merchandise to sell at the local *souk* (market). The aromatic plants are gathered in the mountains in the summer period. Intermediaries with trucks usually collect in the most remote villages to sell to other intermediaries at the local *souk* and then transport the product to bigger towns such as Marrakech or Casablanca, especially for distillation (Montanari 2004).

Given that 50.63% of men and 14.19% of women are active in the labour market, the rate of unemployment at 6% is low. The population is mainly young and very active. The average age for marriage in Ijoukak commune is low compared to the national average, ranging from 31 for men and 27 for women, though is 15-25 and 18-21 in the valley villages. Twenty three percent of the population has received schooling. This rate is lower for women; with only 6% having access to education compared to 44% for men (Benaboubou 2004d). Although there are adult literacy programmes, administered by a woman from the village, illiteracy is high: 84.39% amongst women and 50.67% amongst men (HCP 2007). Because the local mother-tongue, Tachelhit, is not officially recognized, the lessons mainly focus on the Koran and basic arithmetic and Arabic. In the whole valley, most inhabitants speak Tachelhit and a small part of the population speaks dialectal Arabic.

While the central government has planned for the remote parts of the country to have electricity and running water by 2012, only 24% and 37% of respectively households benefit from these commodities in the Al Haouz region. In the Agoundis valley, the main sources of light remain candles (36.5%), gas (80.8%) and solar panels (18.3%). Spring water is the main source of water supply for 80.3% of the population and village fountains for 23.8 % (HCP 2004; 2007). The Agoundis valley and its villages do not have medical facilities. From El Maghzen the nearest such facilities are eight kilometres away in Ijoukak and thirteen kilometres in Talat n' Yacoub. Accidents do occur, such as insect and snakebites, grazes, open wounds or falls from the mountainside. In such an event, one would have to rely on a truck or a mule to reach the dispensaries. Time is crucial in such a situation, and depending on the gravity of the accident, it may be possible to minimise risks if one can reach the closest dispensary on time.

Nowadays, families have no more than three to four children, but in the past, it was common for women to have up to ten or twelve. Some women would sometimes lose as many as five. Women still give birth at home and child mortality remains high, at 7.5% (HCP 2004). Children are central to production in this rural environment and parents view their children as a source of wealth and power. Moreover, children cost less in the rural areas than in towns. Children may go to the local school to learn Moroccan Arabic, mathematics, and to read and write. The local commune encourages parents to send their children to school. However, very few children can make it to college for further education. From an early age, children work in agriculture, wood and water collection. The parents do not have the money to send their children to further education. Children are regarded as being more useful for their contribution to the household. Girls take care of their younger siblings, thereby relieving a mother pregnant with another child; or they may work in the fields. Boys tend to labour in the gardens or at the river. Members of Berber families work together but also divide the rewards together and the elderly rely on their adult offspring for care.

To understand the communities of the Agoundis valley, it is essential to understand the notion of hazard (Garrigues-Cresswell and Lecestre-Rollier 2002). Hazard in this environment is a constant, whether climatic, physical, biological or socio-political and it is usually the most vulnerable groups with the least power who inhabit the most hazardous environments (Collins 2008a). Hazard does not necessarily refer to accidents or unpredicted events, but the likelihood of delays and inconveniences for which the whole society seems to be organised to anticipate. Community social organisation through the family or between villages or inter-tribal sections, serve to redistribute surpluses in times of plenty but also to buffer against shortages. It requires a high level of adaptability and flexibility to react swiftly to these hazards and events.

3.14 Migration

According to Mghari (2007), of all returning migrants to Morocco, 76% are rural born, against 24% born in urban areas. Most emigrants usually come from poor rural areas, generally mountain regions, with a high population pressure, as is the case in the Souss-Massa-Draa. Rural migration, regardless of its frequency, over time has become increasingly significant socio-economically in the region. The figures for the study area in the Agoundis valley are shown in table 3.2.

Table 3.2: Out-migration in the Agoundis valley**Source:** Benaboubou 2004 (Observatoire national des migrations MOR/99/01)

Douar	Seasonal migrants	Permanent migrants	Average number of seasonal migrants per household	Average number of permanent migrants per household
Angzdm	6	1	0.54	0.09
Agadir	18	0	1.63	0
n'Imenzal				
Toundafine	31	18	0.86	0.5
Aït Youb	36	5	0.59	0.08
Addqqi	3	3	0.21	0.21
Agrada	12	6	0.31	0.15
Aït Moussa	5	7	0.22	0.31
Amsslan	10	8	0.71	0.57
Anammr	4	16	0.26	1.06
Taghorghist	3	9	0.09	0.29
Ighir	12	7	0.44	0.25
Tazoughart	3	0	0.27	0
Tijrichte	10	25	0.27	0.67
El Maghzen	27	5	1.03	0.19
Tagdite	0	63	0	1.26
N'Ouffla				
Tagdite	9	13	0.32	0.46
N'Izdem				
Mejjou	12	68	0.24	1.36
Total	201	254	7.99	7,451

In recent years, seasonal migration has become common in most villages. It is connected with desertification that began to have an impact towards the end of the 1980s. Younger men already married leave the valley to seek temporary employment in the towns and in the farms of the Souss. However, most migrants return during the celebration of Aïd Adha. Permanent migration is significant in the most populated *douar* of the Agoundis. Migration has benefited certain lineages descended from the local Gondafi elites while others have held responsible posts at the local mine. Migration out of the area remains a concern for the Moroccan authorities and being remote from towns and transport routes, the Agoundis valley villages reflect well the neglect by the state of isolated regions. Younger people increasingly seek to escape the constraints imposed by life in the valley (table 3.3).

Table 3.3: International emigration from the Agoundis valley
Source: Benaboubou 2004 (Observatoire national des migrations MOR/99/01)

Douar	Number of migrants	Destination countries
Agarda	2	Holland, Italy
Aït Moussa	1	Italy
Ighir	5	France, Holland
Tazoughart	1	Libya
Tijrichte	2	France, Italy
El Maghzen	1	France
Mejjou	3	France

3.15 The production systems of the Agoundis valley

The production systems operating in the study area are farming (at the bottom of the valley), pastoral transhumance and arboriculture. The villages involved in these systems are grouped into three vertical zones. Altitude, the presence of forest, seasonality, snowmelts and hydraulic potential all influence how these systems are combined.

Table 3.4: Location of *douar* in the three different altitudinal zones of the Agoundis valley. **Source:** Benaboubou (2004:44).

Zone	Altitude	Douar
Upper Zone	2100 to 2400 m	Angzdm Agadyr N'Inmzal Aït Youb Tigountafine Zaouite Tagdite n'oufla Tagdite n'izdern
Intermediate Zone	1600 to 1800 m	Addqui Aguerda Aït Moussa Taghorghist Mejjou
Low Zone	1300 m to 1400 m	Ighir Tazoughart Tijrichte El Maghzen

Barley, maize and potatoes have long been the only irrigated crops on the upper part of the valley. More recently, alfalfa (*Medicago sativa*) has become important as a fodder crop, reflecting the increased significance of livestock in the farmland. Barley is permanently cultivated on new terraces and the land is never rested. Yields of all crops are low. The reasons for low yields are mainly drought, and also problems in irrigation organization, a shortage of manure and the inability to treat the various diseases that affect both field crops and fruit trees¹³. The economy of these villages completely

¹³ *Ajddar* is the name given to diseases affecting fruit trees. These include *Nectria gallinaga* infection or European Chancer and *Coreynum (Corynum beijerinckii)*. Both

depends on the raising of herds and on arboriculture, which complements cash income. In this upstream part of the valley, villagers possess up to 2,784 head of sheep and an average of 3,200 goats, with an average flock size of between 25 and 30 head, with one to two head of cattle. Characteristic of this zone is the heavy dependence on transhumance. In drought years, the cattle are taken as early as April to the *azib* (shelter) because forage is insufficient to keep them close to the house. The distribution of livestock can be seen in table 3.5. The total flock of sheep and goats is 6,177 head in this part of the valley.

Table 3.5: Herds by *douar* in the Agoundis valley

Source : Benaboubou 2004 (Recensement général de l’agriculture 1995).

Douar	Number of households	Number of cattle	Number of sheep	Number of goats
Angzdm	11	8	28	38
Agadyr n'inmzal	11	12	100	140
Aït Youb	61	90	683	1060
Tigountafine	36	32	410	325
Zaouite	19	19	215	325
Tagdite N'oufla	50	107	860	1120
El Maghzen	12	40	77	84
Tijrichte	37	36	38	494
Ighir	27	32	22	244
Tazoughart	11	13	4	83

of these are ascomycete fungi and known to provoke a gall on fruit trees and vegetable crops (Personal communication, Reguieg 2011). In the Agoundis valley, *arraquia* or anthracnosis affects onion bulbs.

The second most important resource for these populations is trees. Walnut is particularly well adapted here and more lucrative than the almond. As part of an initiative organized through the Toubkal National Park, apple trees are being supplied to private growers, and the small *douar* of Agadyr n’Inmzal and Angzdam have received a supply of 200 young trees. The experiment has yet to yield results.

Table 3.6: Cultivated trees in the Agoundis valley

Source: Benaboubou 2004

Upper zone					
Douar	Number of almond trees	Number of walnut trees	Number of apple trees	Number of cherry trees	Number of olive trees
Angzdm	0	329	620	40	X
Agadyr N’inmzal	67	190	753	28	X
Aït Youb	981	651	0	0	X
Tigountafine	88	107	0	0	X
Zaouite	0	281	0	0	X
Anammr	0	176	85	41	X
Tagdite N’oufla	736	113	0	0	X
Intermediate zone					
Taghorghist	528	62	245	62	88
Adqqui	340	191	160	0	0
Aguerda	888	266	266	170	0
Aït Moussa	395	190	390	105	0
Mejjou	453	66	0	0	33
Lower zone					
El Maghzen	302	156	436	0	475
Tijrichte	1000	157	10	0	353
Ighir	402	111	0	14	58
Tazoughart	145	22	20	0	33

Key: X= no data.

Land availability for agriculture distinguishes the intermediate zone. However, these *douar* are quite different from Ait Moussan and Aguerda. There, land availability does not exceed more than one *abra*¹⁴ per household compared to two to four *abra* per household in Taghorghist. The production system in this zone is characterised by irrigated farming where barley and maize are predominant crops, alfalfa and potatoes occupying a small place. Because of the shortage of agricultural land, arboriculture is an important supplement. Almond trees are predominant, 46% of the fruit trees in the zone. Fruit trees recently introduced develop slowly, and represent 39% of the arboreal heritage. Walnut trees occupy only 15% of the territory. As in other villages, arboriculture has to cope with similar diseases in the absence of phyto-sanitary treatment and pesticides, regular pruning and harvesting as well as problems associated with irrigation.

The villages of the lower part of the Agoundis valley are situated along the Assif Agoundis and Ait Ahmed. This is a zone marked by the presence of phosphate mines. In these villages, land is comparatively abundant and superior to that of the intermediate zone of the valley. Households cultivate between 2.25 and 2.5 *abra*. Barley and maize are the main crops with little land allocated to potatoes, onions, vegetables and alfalfa. The pattern of arboriculture in the lower part of the Agoundis is similar to that found in the intermediate zone, but with the introduction of other fruit trees. The presence of carob trees, even though the number does not exceed four to five trees per household, represents a valuable asset fetching between 3.50 to 5 dirham according to the size of the pods.

Livestock farming in the lower part of the Agoundis valley shows a regression compared to the higher and intermediate zones. The average size of herds per household is smaller, varying from five to 20 head, whereas the average herd comprises 11-15 head. Young boys generally manage the flocks. Forest fodder constitutes most of the feed although women cut fodder in the gardens to supplement this. Most farms possess one or two cows, maintained mainly by women. Barley seldom supplements animal

¹⁴ *Abra* is a unit for measuring land, and determines the amount of grain that can be harvested. For instance, for barley, it amounts to 14 kilogram and 16 to 17 kilogram for wheat (Personal communication, Boujrourf 2011).

feed but hay is used as long as it is available. A characteristic of this zone is its proximity to the forest.

3.16 The social management of irrigation and transhumance

There are different types of collective water resources. These consist primarily of the Agoundis and Ait Ahmed *oued* (streams). A hydraulic unit for collective management is defined by a central *targa* (irrigation canal), fed by a water pump coming from an artificial pool or from a water catchment associated with a more recently-built cement dam. These initiatives have been funded by the Fonds International de développement de l'Agriculture (FIDA) and the Agence de développement solidaire (ADS) and replace the old traditional system. There are two types of water distribution system. The first is called *tawala* and supplies water on request when it is abundant, particularly during the springtime. The second is called *nouba* in which distribution is based on water rights and timed allocation according to lineage. It is the most common system. The allocated time varies from half to a whole day, depending on the accounting unit from the artificial pool.

In part of the High Atlas where transhumance still occurs, another type of resource management institution known as the *agdal* system functions at a larger territorial level than that of the fraction and tribe (Dominguez et al. 2011a). In the High Atlas, the *agdal* designates a method of appropriation and management of the land, a status resulting from customary rights. This method of managing common resources is implemented by the *jama'a* which regulates access to a lineage territory and its resources. It is a geographical and agro-ecological space characterised by the physical environment and specific biotic resources (trees, pasture, and agriculture). Rigid opening and closing dates for usage of specific- collective pastures regulates and sustains these grazing practices. *Agdal* are typically found in high mountain pastures and are the most widespread and formalised system of transhumance where good pastureland and water can be found after the winter snow and during the dry summer months. This system is important because traditionally Berber pastoralists followed a pattern of seasonal migration, grazing herds at low altitudes during the winter and at higher altitudes in summer, allowing for the regeneration of pastureland during the months when the *agdal* were closed (Mahdi 1999c; Auclair 1996).

In the Agoundis valley, Wanoukrim and Wijdane on either side of the high mountain peaks, the local population access *agdal* areas at various altitudes. Two kind of transhumance can be distinguished. Each family will send at least one person. However, the situation can vary depending on the annual rainfall and grass availability. Shepherds will lead their herds in two main directions on either side of the Assif Agoundis. On one side of the valley, mount Wanoukrim covers the villages upstream of the valley along the Assif Agoundis. In Wantkhfar, cultivated fields belong to the villages Angzdm and Agadyr n'inmzal. Each household possesses a few plots of land and a *tagdalt* (flooded field where grass is grown for hay). Mount Tifira of the other side serves the transhumance purposes for the villages of Tifiras, Tayndar, Tamjjot, Tagdite, Anamer, Zaouite Oumsslane. Local women and girls go on this journey and spend the day collecting thorny xerophytes, especially *taoura* to feed the cows. The cow is central to the household because it produces milk, manure and is means of mobilising capital in case of financial need. These customary institutions provide flexibility allowing migrating flocks to adapt to environmental changes. On all socio territorial levels, such local practices unfold regulations for the access and use of these common resources. The community allocates guardians to watch over the resource, and applies sanctions if needed (Romagny et al. 2004).

The opening and closing dates of the *agdal* areas varies according to clan affiliation. The *jama'a* decides who has access and who is excluded. The *jama'a* and the fractions can petition for access rights or make complaints on behalf of individuals or families, while judicial and executive authority rests with *amghar* and *caids*. Breaking the rules may result in fines, loss of access rights, and ultimately exclusion from the clan or tribe. The result is a relatively sustainable rangeland management system, ensuring that little pressure is exerted on pasturelands through limited user access, as well as the closing of pasture areas to allow adequate recovery time.

3.17 Conclusion

In this chapter, I have described the geographical context of the study area, and the Moroccan political system in relation to the general economic conditions that impinge upon it. I have provided an overview of the High Atlas Mountains, and indicated the importance of the National Toubkal Park in this particular environment. I have reviewed the general historical background of the contemporary populations of High Atlas Mountains, and explained how historical events, especially during the colonial period

led to the suppression of Berber identity and how this influences the present day political configuration. I have described traditional and modern social organisation in the Agoundis valley and explained how regional socio-economic factors contribute to the maintenance of Berber autonomy.

Although the Berber populations of the Agoundis have a complex history and are accustomed to change, their subsistence strategies are essentially conservative and risk-averse in a time of uncertainty. There is a high level of self-sufficiency and autonomy. Natural resources (despite some degradation) are adequate, while social relations through which they are managed and the internal form of environmental regulation derive from customary law. It is a system that Lyautey would have understood, and approved of. On the other hand, state political control is still interventionist embedded in a ruling culture of domination and submission. This is exemplified for instance, in any visit to when a local government's building such as the *caïdat*, with its strong military presence. The government continues to exercise close control over the local population and resent external interventions, including foreigners entering the valley without prior consent.

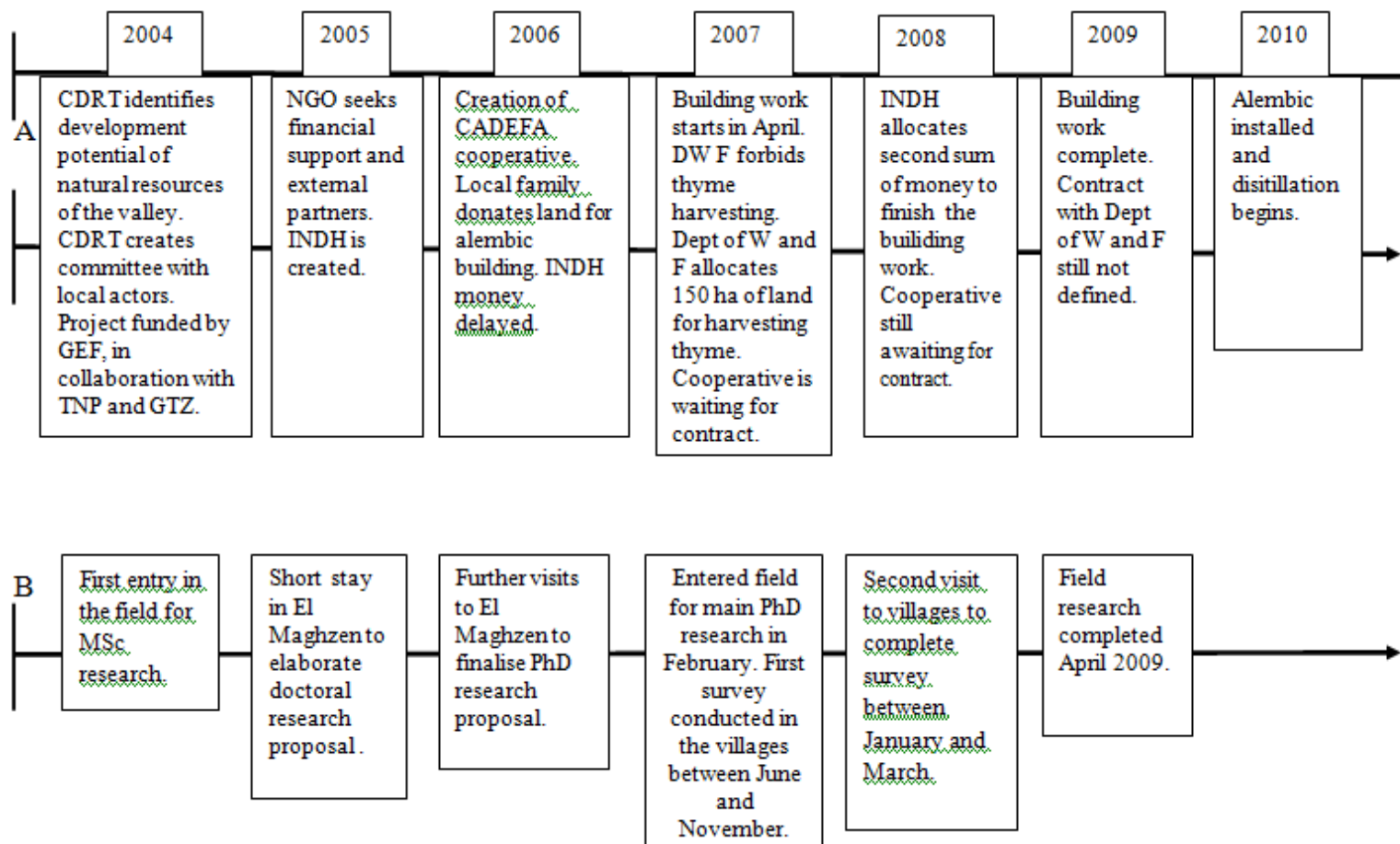
CHAPTER 4

Fieldwork in the Agoundis Valley

4.1 Introduction

I first visited El Maghzen in 2004 while conducting research for the completion of my MSc in Ethnobotany. At that time, my objective was to trace the commodity chains and to identify the trade intermediaries involving local aromatic plants. This was my first encounter with an isolated community and as a first time researcher. I gradually gained social entrance with the local people and developed personal relationships with the villagers as well as establishing some rapport. My visit occurred at a critical time, and people questioned my presence. Wary of the local authorities, particularly the Department of Water and Forestry, villagers initially had in mind that I was making investigations on behalf of the Department. My research assistant at the time facilitated this initial access and managed to persuade villagers that I was working quite independently. I completed the research in July 2004 and in my dissertation (amongst other things), I recommended that essential oil distillation might prove to be a viable option for the village. My repeated visits to El Maghzen during 2005 and early 2006 to draw up a PhD proposal led to further integration into the village life. My host family made their home my home and we built a strong relationship based on trust and a common sense of purpose. We shared many unhappy as well as many happy moments. The relationship between these various visits and the way the distillation project has unfolded is shown in figure 4.1.

Figure 4.1: Time line showing (a) key events in the planning and operationalisation of the Agoundis valley distillation project, in relation to (b) phases of field research conducted by the author.



4.2 The observing participant in applied anthropology

By the time I re-entered the Agoundis Valley in early 2007 to conduct a two-year field research project, the villagers knew me well and trusted me, and expected me to provide leadership implementing the distillation project. I often had to remind them that this was not my role, and that I was not there to ‘make it happen’ but to try to understand how the project would unfold. Although I had gained people’s trust, I always kept in mind that hospitality and openness was never something to be taken for granted. I had learned this through informal meetings with both women and men on different occasions. The lesson had taught me that when I thought that we had taken a step forward and made progress, it was only to discover that we had regressed two steps the next day. Kindness, warmth, and hospitality abound in this community but it is also a hard life and people are very independent-minded, resourceful, self-sufficient and seldom requesting outside intervention nor expecting it. I decided that one way I might reinforce trust would be to give basic French lessons for which almost everyone in the village turned up. During my stay in the Agoundis, I grasped some basic knowledge of Tachelhit from one of the daughters of the household where I was staying, and with whom I developed a strong friendship. She was very happy to give me Tachelhit tuition in exchange for French basic vocabulary and grammar.

The plans for the essential oil distillation project were in their early stages when I first arrived. My host family and other people regularly updated me on events that had occurred during my absence on returning to the village. I had been told in Marrakech that money had been allocated and the building construction work was about to start. However, when I arrived in the village, I was informed that money had indeed been released, but that it was held up somewhere in some complex bureaucratic process. This was the beginning of a series of obstacles associated with the project. As timing is everything, I had to start interviewing people as I wanted to capture people’s perceptions of the project in its initial stages while it was still fresh in people’s minds. However, my research permit authorisation was delayed at the Ministry of Interior in Rabat. The local authorities knew of my presence even though they never came to the village. The local reporter had informed them unofficially, so they knew of all my movements and this caused concern. My host family, being aware of this, reported to them that I was just making a courtesy visit, prospecting while waiting for my official research permit. When events became political at various stages of the research, the father of my host family would always advise me with the comforting words: ‘*Imikk*,

simikk (meaning 'slowly, slowly, do one thing at a time'). It also had the connotation of 'be careful where you tread'.

More often than not, contemporary research fits uneasily with a sustained appreciation for the 'other'. Cloke (2002) warns that effective participatory research may be impeded when it is connected to sponsorship. Ethnography becomes non-committal and has very little to do with the people and issues that are being studied. Bearing in mind that it is numbers that tend to most influence policy makers in government and industry, decisions that affect populations within their natural environments are often based on these findings, regardless of the community setting. May (1980) further questions to what degree research projects and the selection of informants are distorted in favour of producing a social pay-off of interest to sponsoring agencies. Cloke (2002a) points out that the fieldworker needs to be self-critical so that the welfare and improvement of the subjects studied becomes a priority rather than merely self-interest. Fieldwork is much more than just a process of discovery; fieldworkers are not simply participating in the cultural settings where their major investigations take place, they are also engaged in a larger public discourse that may be little connected with the conduct and purposes of fieldwork. The way we do our work as researchers, the institutions or governments for whom we work, and the goals of our research, cannot be separated from the kinds of people we are (Chambers 1980). As I was conducting the interviews in El Maghzen and in other villages in the project area, I found that the people were weary of inaction, angry, frustrated and disillusioned. They were resigned to unfulfilled promises. They were very happy to talk to me and share information that they had hitherto withheld, but it was as if there was a 'them and us' attitude towards the local authorities and the invisible bureaucrats, conveying false hopes on the one hand and the 'forgotten Berber people of the mountains' on the other.

Arce (2003) claims that the emphasis on prioritising people's knowledge and experience has slightly shifted in social development work over the last two decades. Participatory approaches and empowerment strategies have claimed to incorporate local actors' capacity to challenge existing social, cultural, and political boundaries in their everyday life. For results to be meaningful and useful, it is argued that research participants need to be involved in the research process, and to exercise a degree of control or ownership over the research process from the beginning to the end (Elias and O'Neil 2006). Research is, however, seldom convincing or comprehensive enough to exercise a decisive impact on policy-making even when it is 'participatory'. While I

considered my own research to be highly significant in bringing positive outcomes for the distillation project that concerns us here, the problem lies in the inability of policy makers and political decision-makers to make the best use of relevant research. Civil servants and politicians are too often concerned with short-term pragmatic bureaucratic objectives, crisis-management and balancing conflicting group demands. They are inclined to prevaricate when it comes to recommendations that disturb or alter existing patterns or when faced with reactive policies for problems that have already emerged and been sorted out through routine administrative and political practices. Research reports are consequently repeatedly sidelined in the policy-making process as the real problems (of implementation) are embedded in political power relations themselves (Stone et al. 2001). I witnessed this in an encounter with a couple of officials who came to El Maghzen to 'conduct' a participatory evaluation of a women's welfare programme. This institution (IFAD) had contributed financially to the installation of rubber piping to bring running water into homes. The men's association was in charge of the installation and it was the president of this association who responded to the questions, hardly the best 'participatory' representative of women's views and opinions on the matter. After introducing myself, I asked why they did not consult the women directly since the installation of running water was perceived as being for the improvement of women's lives. I offered to find them women who would willingly participate in the evaluation. The answer I received was that the president was a good representative of the women, who would (anyway) be consulted later. I then asked why there was no comparable water project for the higher villages such as Tagdite. In answer, I was told that because there is money up there, they do not need it, a view I insisted on contesting.

Most researchers enter the field committed to a code of ethics and to informant consent, having secured research permits, timetables, and affiliations with suitable local institutions, before leaving for fieldwork (Hertel et al. 2009; Monamy and Gott 2001). However, they seldom anticipate or are prepared to tackle political implications of fieldwork. In relation to the area of environmental policy in particular, a number of authors (Walker 2007; Paulson et al. 2003) have discussed the challenge that political entanglement present. Castree (2000) reminds us that researchers need to think further about the process of fieldwork so that it can be conveyed outside the academic settings in order to liberate and transform their research subjects and the process of fieldwork. I was well aware that local villagers had put great hope in the distillation project, though on a couple of occasions I was told that: 'Some people don't want the project; they will

do everything to stop it'. I was seriously starting to doubt whether it would deliver people's aspirations and expectations. As the research unfolded and I found myself digging deeper into local and higher-level political agendas, I increasingly felt that my research was intrusive. People warned me several times that I should not eat alone and should accept food only if everyone was eating from the same dish. My increasing engagement with the local population and my inevitable political involvement started to affect me psychologically. In November 2007, I therefore decided to withdraw for a while, stay away from the village and let people forget about me. One of my main concerns was the protection and welfare of the people whom I was studying. As Bannister (2007:16) has put it, 'the promotion of the relevance of biological and cultural diversity without jeopardising the people that one seeks to protect is obviously a dilemma'. For instance, at one point, I found myself caught-up in a conflict between the institutional partners - CDRT, the Toubkal National Park, the Department of Water and Forestry and GTZ- as to the ownership of the project. This forced me to handle some data collection more discreetly. On one side, institutions requested me not to disclose any information that I had been collecting, to which I responded that the data were confidential and that it was therefore unethical to release information anyway. I was further required to disclose some of my research results by another partner, to whom I responded that the results would be available only after the completion of the thesis. If some government agencies had access to sensitive information regarding individuals, there was a danger of harming research subjects and jeopardising confidentiality agreements (Trend 1980; Chambers 1980a). Because confidentiality is paramount and data are sensitive, the names of informants are anonymised throughout this thesis and in my various reports. Also and throughout the thesis, all observations relating to the Agoundis which are not supported by references are the result of my own fieldwork.

4.3 The project and its methodology

The project for essential oil distillation in El Maghzen (Appui à la mise en place d'une stratégie participative de gestion des ressources naturelles dans la zone de El Haouz et du Parc National du Toubkal, CDRT 2005) was part of a bigger project related to the conservation of natural resources in the Toubkal National Park. In addition to Toubkal National Park, it included the following six consortium partners: the Global Environmental Fund (GEF); the United Nations Development Programme (UNDP);

GTZ (German Technical Cooperation); Direction Provinciale de l'Agriculture de Marrakech; Direction Régionale des Eaux et Forêts; and Initiative Nationale de développement Humain (INDH) in the province of Al Haouz. Four different components were identified as part of the Ijoukak project (as some people referred to it at the time): wood and energy, agro-biodiversity, medicinal and aromatic plants (MAP), and ecotourism and the organisation of local committees for natural resource management. These main components were further subdivided to address specific practical issues: reduction of wood consumption, promotion of renewable energy for heating, water sanitation, cooking food, participatory re-forestation, adding value to aromatic and medicinal plants, agro-diversity conservation, awareness training related to the conservation of biodiversity and MAP, and workshops on harvesting methods and tree plantation. The assumption was that awareness would follow economic incentives, and encourage people to manage their resources more efficiently.

The proposal for the cooperative to support the essential oil distillation project was aimed largely at the men of the village of El Maghzen along with the other eight villages. As the first stages of the project were taking place in El Maghzen, women became involved making homemade biscuits and couscous in their association (Association pour le développement des femmes de la vallée d'Agoundis). Although not directly connected to the project, these activities were reflected in my interview data. There was a further plan at a later date, to develop a women's cooperative, involving activities such as fruit drying and carpet weaving. However, the primary focus of this thesis is the extraction of aromatic plants and the organisation of local communities of the valley (particularly men) to add value to this activity through the distillation project.

The first strand of my methodology was designed to scrutinise perceptions of the project among the various stakeholders, the villagers, the NGO and the other institutional partners. I wanted to identify and understand the mechanisms by which the project could be implemented, and to map out the configuration of actors instrumental in this process. I wanted to analyse critically the mechanisms for implementing the project, identify the main factors in its execution and locate the blockages that might prevent its realisation. The second strand of my methodology was designed to address the botanical knowledge of the villagers and to assess how this knowledge might be harnessed for community enterprise. As part of this second strand, it was necessary to take a closer look at processes for the transmission of knowledge, evidence for its erosion and how the project might influence this.

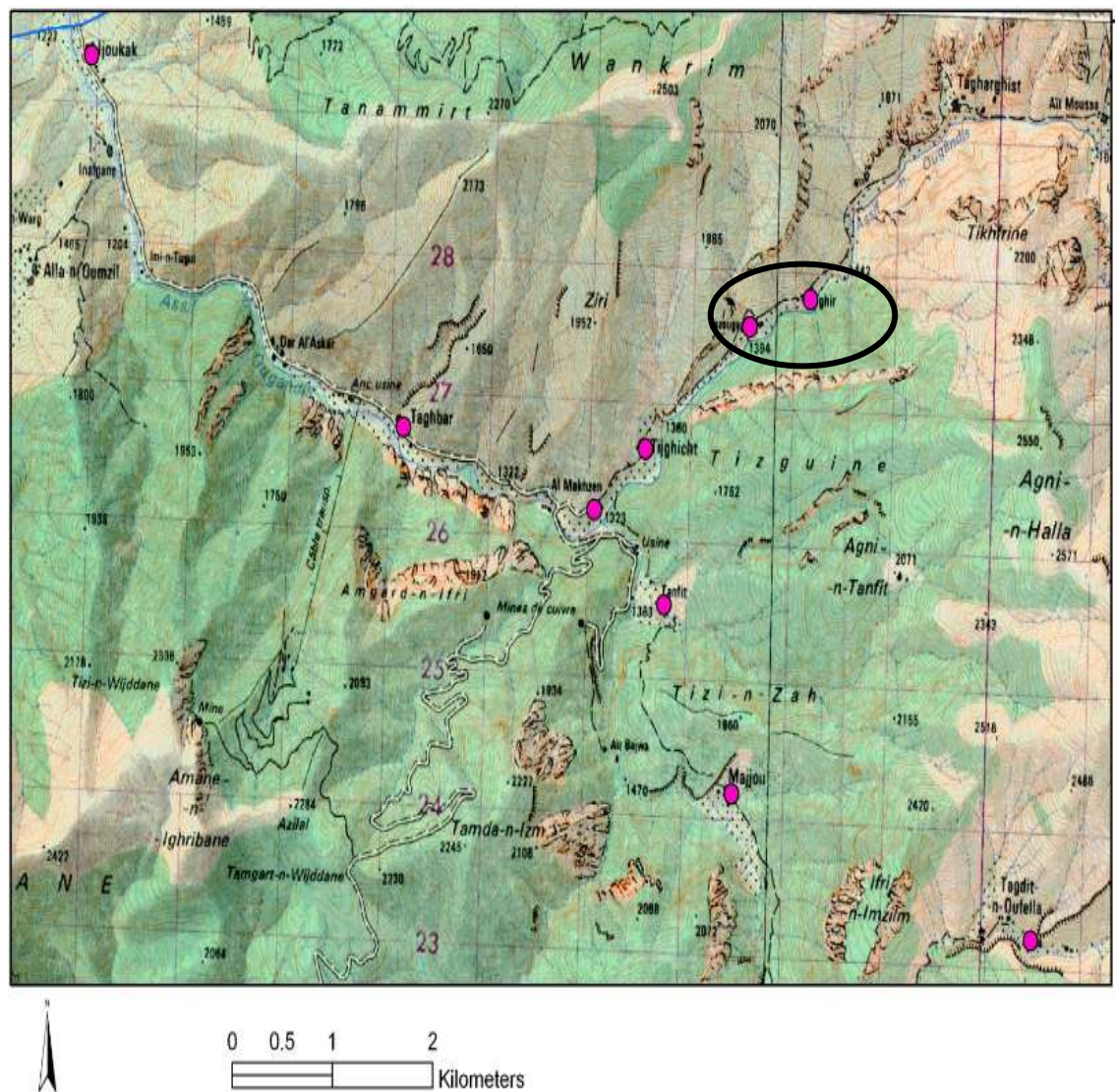
Odell Butler (2005) has pointed out that often researchers have to alter or at least adapt their methodology according to the field situation. The best approach for the researcher is the one that works, is well conceived and which facilitates decision-making and action in the field (Patton 2002:39). Haldorn et al. (2006) uses the term ‘trans-disciplinary research’ to refer to research that shifts flexibility between different intellectual tools and models to find effective solutions to a given problem. Although I did not enter the fieldwork with the intention of deliberately facilitating the project, researching the implementation of the project while at the same time encouraging might be thought to qualify as a kind of ‘action research’. I therefore developed a ‘grounded’ and flexible methodology in the field as the first events connected with the distillation project slowly unfolded. I planned to work outwards in geographically concentric circles, starting from the core, and moving to the periphery. The first phase would begin with the survey interviews throughout the valley and the first research subjects would be local villagers, because they were the most closely involved and affected by the directives of the project. With this in mind, I sought to map social networks in order to discover the means by which information was disseminated to identify the most influential and involved actors at the valley level, to discover what mattered most to the people about the project and their willingness to be involved. The institutional partners constituted the second phase. By analysing local perceptions and the implementation directives, I sought to identify those factors that facilitated realisation of the project as well as those that blocked it. The informal ethnographic data gathered through participant observation and personal interactions with the actors, outside the systemic survey interviews, was to fill the gaps.

4.3.1 The villages

El Maghzen is the centre of essential oil distillation (figure 4.2) in the Agoundis valley. It is situated eight kilometres from Ijoukak, at an altitude of 1,300 metres and is accessible by foot and now by a regular truck on a more or less daily basis. This is a considerable improvement compared to the situation in 2004. At El Maghzen the valley splits into two, one part ascending to the southeast with settlement along the Assif Ait Hmed, and another part ascending to the northeast with settlement along the Assif Agoundis. Men from the village association have provided every household with water from a source emerging from the mountainside and each household is now equipped with a water metre. There is no mains electricity at the time of the fieldwork but

villagers possessed a few solar panels. Electrification, as part of the National Electrification Programme (PERG) was due to take place in 2008, and finally materialised in 2011. There is a school in El Maghzen that the children of Tijrichte and Tenfit also attend. The village comprises 26 households. It was in El Maghzen that we conducted the first interviews with 53 women and 34 men regarding their perceptions of the project, and with 32 women and 24 regarding thyme harvesting.

Figure 4.2: The eight villages of the Agoundis valley involved in the distillation project
Source: Ministère de l’Agriculture et de la réforme agraire 1997.



Key: The eight villages involved in the project are represented in pink. Because of the small numbers of informants in Ighir and Tazoughart, the interviews for these two villages have been grouped together and are circled in black on the map.

Eighteen kilometres to the southeast of El Maghzen along the Assif Ait Hmed, is the *douar* of Tagdite. Tagdite is composed of three parts, N'oufella (high), N'izdern (low), and Douroulid. These three hamlets situated at 2,400 metres are close together, Tagdite N'izdern two to three kilometres below. These villages are particularly difficult to access. A truck goes up and down once or twice a week along a very dangerous rugged mountain cliff road. Sometimes, despite the heat, I would travel on foot in the interests of safety. There is a school in Tagdite N'oufella but not in Tagdite N'izdern. These villages do not have electricity or running water. Water must be collected at the village fountain when available but mostly it is drawn down at the river. The inhabitants rarely see any 'arumi' (plural *irumiyn*), or white Europeans. Social entrance was difficult as people shy away from foreigners. Even my young research assistant who came from El Maghzen was perceived as a stranger. Use of distant family acquaintances made access easier. The living conditions are basic and precarious with heavy snowfall in the winter months and high temperatures in the summer. I conducted interviews between May and October 2007 to avoid the hard winter season. Benaboubou (2004) has estimated that there are 50 households in Tagdite and 63 permanent migrants. After consuming large quantities of tea, almonds, walnuts and tajine, we conducted 34 interviews with women and 23 with men on project perceptions, also finding time to attend a communal male circumcision ceremony. During the week that we stayed in Tagdite, we gathered another 32 interviews with female thyme harvesters and 20 with male harvesters. We also obtained further data informally from other individuals, including members of the local association or cooperative.

Mejjou is a village half way between Tagdite and El Maghzen, at an altitude of 1,860 metres. Being lower down in the valley, it is a more exposed to the 'outside' world, with some members of the community living and working in Marrakech. There are 45 households in Mejjou and 68 permanent migrants. Twenty-two interviews were collected with women and 16 with men on project perceptions and 22 with female thyme harvesters and 16 with male harvesters during the month of November 2007.

Below Mejjou and closer to El Maghzen, is the small village of Tenfit. Tenfit is estimated to have 15 households. Copper and mineral mines that were operating in the valley until 1986 are associated with this village. The mines gave employment to about 50 people in the whole valley, at a time when the villages had some kind of prosperity. The metal shell of the mine still stands and the site is supervised by a guard. We

conducted 12 interviews on project perceptions with women and six with men, and eight interviews with female thyme harvesters and seven with men.

Ighir and the neighbouring small village of Tazoughart stand at an altitude of between 1,394 and 1,442 metres along the Assif Agoundis. It is about five kilometres from El Maghzen. There are 30 households in the two villages and seven permanent migrants. We conducted 23 interviews with women on project perceptions, and 21 with men and a further 23 interviews with female thyme harvesters and 13 with men.

Half way between Ighir-Tazoughart and El Maghzen is the village of Tijrichte at an altitude of 1,360 metres. Thirty-seven households live in Tijrichte with 25 permanent migrants. We conducted 16 interviews on project perceptions with women and 20 with men, and 10 interviews with female thyme harvesters and 19 with men.

Having started in El Maghzen, we finally worked our way down to Ijoukak. Before reaching Ijoukak, half way down the valley between El Maghzen and Ijoukak is the small village of Tarbat comprising 23 households. Here we interviewed 11 women and 10 men on their perceptions of the project, together with another 11 women and 10 men regarding the harvesting of thyme. Ijoukak, comprising 60 households, was the last village in which we interviewed, lying at the bottom. Here we conducted 36 interviews on project perceptions with women and 25 with men, and only two interviews on thyme harvesting with women and five with men, as very few people harvest thyme in this village. In addition, we conducted a few interviews on the other side of the river in the small village of Inzghan, a village that is not included in the project because geographically it belongs to the district of Talat n'Yakoub and not Ijoukak.

At the present time, little is known of the ethnography of the Agoundis Valley. Crawford who worked in Taghorghist (1998-1999) has undertaken most work here, and Russell (2004), a Peace Corps volunteer, has worked around the Toubkal. Two Moroccan researchers (Benaboubou 2004a; Kadouiri 2007) have studied the natural resources of the valley and provided an ecological assessment. My own work has been characterised by the extensive use of participant observation methods, and a critical reflexive approach that focused on everyday activities. I gathered ethnographic data while visiting *igran* (gardens) in Tagdite, Mejjou, Tenfit, Tijrichte with the women. I was involved mostly in the daily life of El Maghzen. I helped to prepare meals, participated in almond and walnut nut-cracking sessions, in henna tattooing sessions, worked in the gardens with the women while collecting and identifying plants, attended meetings with men and women and at literacy classes with women. I found this

essential to understanding people's everyday living conditions, their hopes, aspirations, religious beliefs, ceremonies, joy, pain and hardship. I took over 2500 photographs not only as technical support for research but to provide a visual reminder of the poverty and socio-cultural distinctiveness of the community.

4.3.2 The use of questionnaires

As I have already indicated, as part of the first phase of my methodology, I designed a questionnaire-based survey to acquire data on the perceptions of the distillation project in each village. I hired a female research assistant from the village of El Maghzen who was a fluent French speaker to conduct the interviews. I took this decision on the basis that it would be easier for her than me to gain social entrance especially in the higher more isolated villages, partly because of her family acquaintances. I also wanted to employ someone local rather than an outsider from Marrakech. It was, anyway, difficult to find a committed non-local translator for a long period, as outsiders find it difficult to live in these locations. Following some introductory briefing, it turned out that my young companion was very efficient in addressing the questions and enjoyed the task. In El Maghzen, the centre of the essential oil distillation and in the other eight villages, men and women judged likely to participate in the project were interviewed as part of a community survey. This not only permitted collection of data on perceptions of the project and group development priorities; but further offered the advantage of covering all sections of the population, increasing representativeness while reducing bias (Perkins et al. 1995; Iosifides 2003). Such an interview-based survey was appropriate because time did not allow for in-depth ethnographic interviews over such a wide area, and the survey allowed me to cover a large geographical area quickly and reliably. The interviews were conducted in Tachelhit, translated back to me in French. The villages of Mejjou, Tagdite (N'oufella and N'izdern, Douroulid), and Ighir-Tazoughart are spread out, situated in locations with difficult access, and with what might otherwise be described as 'hidden populations'. To ensure that the survey reached people in these villages, I opted for a snowball technique, involving being introduced to new informants, by previous interviewees (Van Meter 1990; Atkinson and Flint 2001). This method has the advantage of enabling a large number of interviews to be conducted with minimal preparation, where resources and time prevent a more formal sampling method and questionnaire approach. Because of the high rate of illiteracy, I aimed to target essential information and vital issues. I sought to access people's perceptions of the

project, their expectations, wishes and hopes; and to encourage them to reflect on the success of projects previously attempted in the region, and on the socio-economic conditions underpinning their subsistence and development priorities. The interviews further addressed questions such as the role of local authorities or any other local persons in leadership positions connected to the implementation of the project; and what people knew about aromatic plant oil extraction and the project. When possible, thyme harvester interviews were conducted in parallel to interviews on perceptions of the project. These sought to estimate the socio-economic importance of the harvest for the household, the harvesting techniques used (cutting or pulling), quantities of thyme harvested per household, remuneration and expenditure, the involvement of middlemen, and the destination of the plant after harvesting.

4.4 Special groups of research subjects

4.4.1 The middlemen

I conducted semi-structured interviews with four middlemen who collect and trade in aromatic plants along the valley. I tried to elicit more data from them, but that proved difficult as the local *caid* forbade any illegal transactions and the middlemen were concerned that their involvement might become known. The interviews took place mainly at the local *souk*. The questions addressed their perceptions and expectations regarding the project, the economic incentives to work with the project, the allocation of earned money, the quantities of plants collected and sold and their destination. A fifth middleman who has since died categorically refused to talk to me. I was told that he believed that I was to blame for the project and hence fully responsible for the *caid*'s decision to punish independent trading activity in aromatic plants. This had jeopardised his business activities.

4.4.2 The local authorities

The President of the commune of Ijoukak is elected locally. In theory, he represents the executive organ of the local community and acts as an agent of the state at the commune level. The New Municipal Charter of 2002 replacing that of 1976 enlarged the councils' responsibilities, thereby giving a new status to councillors and assigning a new role to the rural regions. For the first time in this new Charter, there are provisions for reducing poverty and social exclusion (El Yaacoubi and Harsi 2005:186). However, the Ministry of Interior appoints the *caid* who has reserve powers and much influence over the

council's affairs, especially in relation to the application of the new concept of authority and local development priorities. He is further influential in the local planning process and maintains relations with other government bodies and administrations (Bergh 2009). The *khalifa* is another local authority figure who works in close collaboration with the commune president and the *caidat*. All three like to know the ins and outs of what goes on in the community, and want to be informed about who is going up and down the valley. Their prior informed consent is needed, and they are concerned above all else with security. It is these officials who are likely to apply pressure if one does not possess the correct research permits. A semi-structured interview was conducted with the President of Ijoukak commune in a local house at the time I was conducting interviews in the village. He did not seem to mind me too much recording the interview. The interview with the *khalifa* was conducted at the commune office and recorded, and although he gave me his permission, he was not comfortable. The interview with the *caid* took place at the *caidat* in Talat n'Yakoub and he refused to be recorded. The interviews addressed perceptions of the distillation project, the role and responsibilities of the commune and of local authorities, the facilities offered by the *caidat* and other institutions, finance, what people expected from the local authorities, opinion regarding the population's ability to comprehend the project, and short-term and medium views of project development. I also conducted a brief informal interview with a civil servant working for the Ijoukak commune.

4.4.3 Centre de développement de la région du Tensift (CDRT)

The CDRT is a small non-governmental organisation created in 1998 and based in Marrakech, whose objective is to contribute to the promotion of the region. Its aim is to provide an institutional framework to help design and implement regional development policies. Semi-structured interviews were conducted with the President and the Coordinator of the project on several occasions. These interviews took place officially at the University Cadi Ayyad and at the CDRT head office in Marrakech. The questions concerned their perceptions of ,and medium-term vision- for- the project, facilities offered by the NGO and its responsibilities towards the project, facilities offered by other institutions, financial contributions, and the organisation's expectations of the local population, and their opinions regarding the population's ability to manage the project.

4.4.4 Toubkal National Park and Department of Water and Forestry

The Director of the Toubkal National Park works in close collaboration and under the same roof as the Department of Water and Forestry in Marrakech. He is responsible for the management and coordination of development initiatives in the National Park. I conducted an interview with the Director, though following the conflict that occurred between the CDRT, Toubkal National Park, the Department of Water and Forestry and GTZ regarding the ownership of the project (mentioned above in section 4.2), he was dismissed and replaced by a woman who I also interviewed. We had two subsequent meetings, at the second of which, she invited me to the provincial workshop in Tahannaoute at which the results of the ecological transects and the pilot essential oil distillation study undertaken by INRA and GTZ engineers were discussed (see 4.4.5).

I also conducted an interview with the Head of the Department of Water and Forestry for the Amizmiz sector. This forestry engineer supervises the district, has a team of foresters working under his direction and is involved in ecological assessment and development projects. I also had a conversation with the Director of the Toubkal National Park Eco-development Office.

4.4.5 Workshop for the restitution of the results of MAP evaluation studies for potential and added value

In October 2008, I accepted the Director of the Toubkal National Park invitation to the meeting organised for the restitution of results. The meeting reported on social diagnostics, the biomass evaluation and the results of a pilot essential oil distillation. GTZ, INRA were assigned these tasks following the conflict that emerged between the institutional partners. A large delegation of officials was present: the Governor of the Province, the Director of Water and Forestry, the GTZ and INRA teams, a representative of the Department of Agriculture, and lesser functionaries, including the Berber bureau members of the CADEFA Cooperative.

4.4.6 Al Haouz provincial office and INDH

I met the Governor on several occasions, one of which was at the restitution meeting described above. I also conducted a semi-structured interview with the Chief of the 'Institut National pour le Développement Humain' (INDH) who shares with the Governor the role of examining projects and the allocation of funds.

4.4.7 Cooperative d' Agoundis bureau

The project is administered through the Cooperative d'Agoundis pour le Développement de l'Environnement Forestier et Agricole (CADEFA), for which the legal articles have been drawn up to give it full control over natural resources in the valley. The Bureau is composed of the President (resident in El Maghzen), the Vice-president (from the village of Tijchrite), the secretary, vice-secretary, the treasurer (who lives in Ijoukak), and a vice-treasurer. Six assessors from the surrounding villages are also members. I conducted a semi-structured interview with the president, the secretary and treasurer regarding their perceptions of, and expectations for, the project, their roles as members of the bureau, and their knowledge of the institutional partners involved. I had extensive informal communication with these individuals throughout the research period, particularly the president and the secretary.

4.4.8 Tudert Cooperative, Smimou, Essouira

The 'Institut de Recherche pour le Développement' (IRD, France) asked me to conduct an evaluation for a women's cooperative for aromatic and medicinal plants in Smimou, Essouira Province in November 2008. As there are several parallels with the Ijoukak project, I consider the results of this evaluation to be relevant to the aims of this thesis.

4.5 Collecting data on traditional botanical knowledge

Data on local botanical knowledge was obtained from the residents of El Maghzen. Time did not allow for checking this knowledge in all the villages involved in the distillation project, except for data collected in the context of the thyme harvest interview. I sought to engage with the gatekeepers of knowledge, and find out how knowledge and skills were transmitted to the younger generation, and whether there was any pattern to this transmission. I used free listing techniques to gather these data, then analysed with Anthropac. The free listing methods and results are discussed in detail in chapter 7. Interviews were conducted with men, women, and a sample of younger people. The interviews sought to identify the vernacular names of the plants, the plant parts used, and the locations where plants were collected and the medicinal use of plants harvested. Further questions were asked concerning whether plants were always present in the home, the source of interviewee knowledge, the place where knowledge transmission occurred, and if the informant had passed on knowledge to anyone in particular (children, grandchildren, neighbours or others).

I collected voucher specimens throughout the research period and these were deposited at the Laboratory of Vegetal Ecology at the Faculty of Sciences, University Cadi Ayyad, Marrakech. I partially assisted with the work on ecological transects but the main task was undertaken by a research student from the Faculty of Sciences at University Cadi Ayyad. The study was undertaken in order to assess the sustainability and potential productivity of *Thymus satureioides*, *Thymus pallidus*, *Lavandula dentata*, *Salvia aucheri* and *Artemisia herba alba* and to acquaint myself with the physical milieu of the plants in the valley, and the geographical spread of each species. To determine the dynamic production of the plants according to the various forestry categories, a multidimensional analysis of species samples and ecological variations as well as an inventory of the medicinal and aromatic plants were undertaken. I performed an essential oil distillation in the Laboratory of the Chemistry Department at University Cadi Ayyad, Marrakech in order to determine the yield and quality of *Thymus satureioides* and *Lavandula dentata*. The extracted oils were then sent for gas chromatography analysis to the Laboratoire de Biotechnologies végétales appliquées aux plantes aromatiques et médicinales, Université Jean Monnet, St Etienne, France, to identify their major phytochemical components, that might be considered to add value to the project.

Although it is too early to predict precisely how the distillation project will affect the traditional knowledge base of the community, I wanted to devise some means of anticipating this. For this purpose, I separated men and women's knowledge and shared activities. I originally thought of using drawings (c.f. Perkins et al. 1995) but decided that it would be simpler to use photographs instead. This is a technique used by ethnobotanists doing ex-situ interviews on plant specimens (Thomas et al. 2007). The advantage of photographs is that they are easily stored and with digital technology, the quality of the images can be checked and promptly adjusted. As I have a large collection of research photographs reflecting many different traditional activities, I selected the best photographs of indoor and outdoor activities, performed by both men and women. These appear as plates in Appendix 7 for male and female traditional activities, and as plates 3.1 (a; b) in Appendix 3 for thyme harvesting. The photographs used were laminated to limit the risk of damp and dirt. This also meant that I could interview informants in any setting, whether indoors, outdoors, in the garden or elsewhere. I further separated female indoor from outdoor activities. Indoor activities included

baking bread (*aroum, tanourt*) and traditional bread oven making, making sour milk, making couscous, cleaning and cooking, sorting out medicinal plants, breaking almonds and walnuts. I then identified outdoor activities, such as medicinal plant harvesting, cow fodder collection, animal feeding, gardening, wheat and barley harvesting, and washing at the river. I interviewed 35 women from El Maghzen asking them to tell me what activities they would gladly give up if they were earning an adequate income from the project. For this, I laid out the laminated photographs on the table or on the ground and asked women to rank the photographs in an order of preference, ranging from the most negatively valued activity to the most positively valued activity. The same process was repeated with men. Male outdoor activities included building dams, maintenance of the irrigation systems, traditional bee keeping, shearing sheep, preparing and cultivating the land, wheat and barley processing, building work, and slaughtering animals, olive oil processing at the mill and thyme harvesting. For this, I interviewed 23 men in El Maghzen. I followed these interviews with further interviews on mixed activities, on those chores that are performed together e.g. olive harvesting, wheat and barley harvesting and almond and walnut breaking. Further questions that were added to the interviews addressed time allocated to the project, and role distribution within the household.

4.6 Data analysis

Having conducted semi-structured interviews with the inhabitants of the eight villages, the collected data contained diverse responses. All perception interviews per village were initially coded according to gender. To find a pattern of key words from the interviews relating to the perception of the project, I initially attempted to use NVIVO, in order to define a representation of key responses. The initial findings were in turn dichotomised on an Excel spreadsheet, to identify frequencies which were then transferred to percentages and column charts for representation. The same process applied for the interviews regarding the thyme harvest and the methods of collection, where the coded responses were inserted into an Excel spreadsheet to calculate frequencies, then transformed into percentages.

The semi-structured interviews conducted with the local authorities contained qualitative data. These were transcribed according to the relevance of analysis needed for the argument. The same applied to the interviews with the middlemen, and with the resident and secretary of the Cooperative.

All interviews relating to indoor and outdoor activities were coded according to gender and age, age being relevant to depict a pattern of transmission between the informants, to identify the potential of erosion between members of the community. In order to rank and find a pattern of the informants' least preferred and most preferred activities, I initially calculated the data by hand and then used an Anthonac ranking exercise. The results were then transferred to an Excel radar chart for better representation.

4.7 Limitations of the research methodology

There were both practical and political constraints influencing how I implemented my methodology. The lack of Tachelhit language skills affected my ability to communicate freely with people, and particularly to grasp important language subtleties in informal conversation. A second hindrance was the low level of literacy in the villages studied. Communication proved to be difficult at times, especially when conducting the questionnaire survey in more remote villages. Use of the snowball technique, however, mitigated some of these problems.

Research budget restrictions affected my pattern of movement. For instance, while it was impossible to conduct interviews whilst visiting a village for the first time, repeated visits were expensive. Going back to the higher villages several times was essential to gain social entrance to get better acquainted with the villagers, and thereby increase the reliability and ease of data collection.

Another impediment in conducting interviews in the higher villages of the valley was weather conditions. Because I aimed to capture local perception of the project at crucial times and at different stages in its development, I had to make sure that I could reach the villages on time. This proved difficult particularly in the extreme winter and summer conditions. I did not use audio-recording devices, and this was sometimes a limitation. For example, the recording of interviews with government and other officials would have been invaluable given the difficulty in getting appointments. However, with ordinary villagers, not to be able to use a recording device worked to my advantage as sight of a recording device would have put people off, particularly in the higher villages of the valley.

Another difficulty encountered was the timing of interviews. The population was influenced by the project events and delays as they were unfolding in El Maghzen. In the higher villages, frustration and inevitable disappointment meant that interviews had

to be carefully worded according to how events occurred. For instance, it was inappropriate to ask people how they would spend the money earned in the project at a time when they had contributed money towards the cooperative but had received no return. I therefore had to choose a more appropriate time. Another hindrance was people's time schedules. Villager routines followed the pattern of daily activities, and I had to wait for appropriate opportunities, such as when women would gather to go to the garden, during the preparation of meals or when men were just back from the mountains.

I also encountered problems during the plant transects. Although I assisted with some of the transect data collection, I opted to keep a low profile to avoid the inference that I was favouring one side or the other, the transects being conducted at a time when there was tension between the CDRT and the Department of Water and Forestry. Furthermore, the scheduling of the plant transects did not always match my availability as I had competing demands on my time.

Given the high political profile of the distillation project, it was sometimes difficult to make sense of the released official information and to check the veracity of its content, especially with key actors in El Maghzen, such as the president of the cooperative and the treasurer in Ijoukak. As people were generally cautious during the period of conflict between the various institutions involved, the president of the cooperative was wary of my role and withheld important information relating to the development of the project. For this reason it was not always easy to obtain accurate information from him.

Political sensitivity also meant that extra consideration had to be given to the protection of the people in El Maghzen. The people in the village, and particularly my host family, not only looked after me to the best of their ability but also stood by me at a critical time when I had to start interviewing people in the village while waiting for my research permit. I felt that I had to protect them to avoid trouble with the authorities. In Tarbat and in Ijoukak, even though I was able to interview informants that I thought were suitable subjects for the study, I had to tread carefully when conducting interviews as many people worked or were informally connected to the commune government. I had to carefully word the interviews and any informal information had to be treated with discretion because it could have been reported back to the local authorities. While the aim of the research was not to intrude on the local authorities, the content of the questionnaires, especially regarding the role of the local authorities in implementing the

project, raised sensitive issues. For instance, the authorities did not appreciate my enquiries regarding their involvement in the project. They perceived my intervention as intrusive.

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CHAPTER 5

The Economics of Herbal Medicine

5.1 The revival in demand for herbal medicine

Worldwide disenchantment with the sometimes unexpected side effects of conventional allopathic medicine – notably its brief and brutal nature – has triggered the revival of herbal medicine and phyto-aromatherapy. Many people in the developed world use herbal remedies because of their increasing reluctance to depend on a single authority for health care, and because they are concerned about the higher incidence of side effects that synthetic drugs can trigger. This revival is based on the allure of preventative medicine, disillusion with conventional allopathic systems in the industrialized countries, and the belief that herbal medicine is a safe alternative to allopathy. The term allopathy here refers to any conventional medical treatment of disease symptoms where substances or techniques are used to suppress or oppose the symptoms (Dorland's Medical Dictionary 1982). Although many herbal products can induce side-effects, especially in conjunction with conventional allopathy (Barnes et al. 1998), in many cases the use of raw plant material is considered a safer and cheaper alternative to synthetic chemical substances. Consumers in the affluent West nowadays take greater control over their life style, in nutrition, preventative practices and general health (Watkins 2002), and have widely adopted the view that natural remedies are safer and better than chemically-based-products. Natural products not only play an important role in both cure and prevention, and in the treatment of minor health problems but are widely used to buffer the increasing costs of personal healthcare (Hoareau and Da Silva 1999; Mahady 2001).

Thus, herbal medicine is perceived as a form of treatment and prevention that supplements conventional medicine. It satisfies a demand not met by orthodoxy, diversifying the conceptual frameworks of medicine (Ernst and Fugh-Berman 2002). Surveys across Europe, Australia and the US reveal that the use of some form of treatment or therapy is widespread outside mainstream public health services (Thomas and Coleman 2004). Because patients increasingly use some form of alternative treatment, the medical profession has had to change its attitude to accommodate a

growing demand (Owen et al. 2001). Increasing public use of complementary medicine is paralleled by the acceptance among family doctors who at some point will refer their patients to alternative practitioners (Pirotta et al. 2000). In Europe, for instance, public demand for over-the-counter herbal remedies amounted to £1.45 billion in 1991, with consumers paying extra health insurance premiums to be able to access some kind of alternative treatment (Fisher 1994). In fact, the public in most developed countries will finance the acquisition of some form of alternative medicines or buy natural products, mainly because insurance policies do not cover these treatments (Bodeker and Kronenberg 2002).

What is more, alternative treatment and herbal remedies are a complement of first choice with patients suffering from chronic diseases (Joos et al. 2006): age-related diseases such as memory loss, osteoporosis, diabetes, and immune and liver disorders for which conventional medicine offers little help. Such patients often respond very well to herbal medicines, which have fewer side effects (Kamboj 2000). The trend is on the increase, as confirmed by a recent survey by the National Center for Complementary and Alternative Medicine in the US, in which four out of ten adults (40% of the population) were reported as having taken some kind of alternative medicine. Natural products ranging from ginseng to combinations of herbal pills are widely used in the US and in 2008, two-thirds of the population was anticipated to be using some alternative natural therapies by 2010 (NCCAM 2008).

A consequence of this huge demand for plant products for domestic and commercial use is the enormous pressure at local, regional, national and international levels, in term of production and environmental impact, in some instance resulting in species extinction. An estimated 70,000 plant species have medicinal value and are employed in traditional medicine worldwide (Lange 2006). Globally, over 50% of raw medicinal plant material may come from cultivated crops. However, medicinal plants are also collected from the wild and this occurs mainly in developing countries (Srivastava et al. 1996). Although nowadays efforts are increasingly geared towards providing incentives for the sustainable use and conservation, habitat and ecosystem destruction, and land conversion to accommodate cultivated crops, some 15,000 plant species and entire plant populations, i.e. about 21% of all species worldwide, are under threat (Wolfgang 2006; Patzold et al. 2006).

5.2 The global economic value of medicinal plants

The global financial value of medicinal plants for the pharmaceutical industry was worth US\$550 billion in 2004 and reached \$900 billion in 2008. Thus, the herbal medicine market has grown in industrialized countries over the last decades and is now flourishing. In the US, herbal products reached global sales of \$200 million in 1988, escalated to the figure of \$3.3 Billion in 1997, and the herbal industry was estimated to be worth US\$62 billion in 2005. The nutraceutical¹⁵ market is also gaining popularity, and in 2001, \$17.8 billion was spent on dietary supplements out of which \$4.2 billion represented plant products (Warude and Patwardhan 2005). A major part of such therapies makes use of some natural form of indigenous drug and an estimated 1500 indigenous ethnic herbals are sold as food supplements (Lange 2006; Patwardhan et al. 2005). Plant products have also found a niche in the cosmetics industry, shampoos, hair treatment and anti-aging creams. These products are designed and formulated to improve skin appearance and health by promoting the rejuvenation of the upper layers of the skin (Cracker 2007).

Asian systems of traditional medicine are numerous: for example Ayurvedic, Unani and Siddi in India, Kampo in Japan and Jamu in Indonesia. Ayurveda utilizes around 1200 species of which 500 are commercialised. The plants used in Ayurveda originate mainly from wild collection, although 10% are cultivated on private lands. In India, around 6000 legal units and about the same number of units working in illegal conditions manufacture ayurvedic medicines. Together with this number of non-organized pharmacies and micro manufacturing units, the overall turnover of the medicinal plant industry is estimated at about US\$10 billion a year with an annual export figure of \$1.1 billion. This demand for Ayurvedic formulae is on the increase at the international level, with a growth rate estimated at 7% annually, and on the Indian national level with an annual growth rate of 20% for domestic products (Subrat et al. 2002). Indian medicinal plant products are largely sold in the US, representing 50% of the total exports in this category. In China, traditional medicine (TCM) is estimated to meet 40% of the medicinal needs of the urban population and 90% of the rural population. China has also successfully managed the promotion of its traditional medicine all over the world. TCM is growing in popularity and the number of licensed

¹⁵ Nutraceuticals or 'functional foods' contain naturally occurring chemical compounds exploited as dietary supplements (Basu et al. 2007).

Chinese medicine providers is increasing rapidly. Huge quantities of plant material are involved and a World Bank report suggests that the annual demand exceeds 700, 000 tons annually. The commercial value of these plants amounted to US\$571 million and the sale of crude plant drugs across China was valued at \$1.4 billion in 2003. China's annual herbal drug production is worth \$48 billion out of which \$3.6 billion goes for export. Japan, Hong Kong, Korea and Singapore are the main importers of TCM from mainland China taking a 66% export share (Patwardhan et al. 2005a).

In Europe, at least 2000 medicinal and aromatic plants are used for commercial purposes, with 1200 to 1300 species being native to Europe. The overall quantity of plants collected from the wild amounts to an estimated 20 000 to 30 000 tons on an annual basis, mainly collected in the wild by rural people, villagers, especially women and often children do not have always have prior consent or agreement from a contractual partner. The herbal market in the European Community represents an important share of the pharmaceutical industry with annual sales in the range of US\$7 billion. The leading country in Europe for import and export of medicinal and aromatic plants is Germany and its annual imports average one-third of the total volume and value imported into the EU as a whole. Germany exports approximately one-fifth in terms of volume and one third in terms of value of the total EU export. Medicinal and aromatic plants in the intra-European trade constitute 40% by volume of all European imports, and 80% of all European exports. Germany is the 'crossroads' for this trade in the EU because of its geographical location between South Eastern Europe (the production end) and North and West Europe (the consumption end) (Patzold et al.2006a).

5.3 The pharmaceutical industry and plant drug extraction

Most western medicines (though produced synthetically) originate from traditional European, Mediterranean and Arabic phytomedical treatments. In recent years, pharmaceutical companies have shown a huge revival of interest in plants and their therapeutic effects, integrating between 40, 000 to 70, 000 medicinal plants, traditional medicines which figure high on the list for novel drug development. The development of new drugs is a difficult process despite the enormous progress in medical chemistry. This is due to a number of facts but particularly because there are many good drugs for many diseases. Further, it is difficult to develop a new drug that is at the same time active and cost effective. Over the span of 21 years (1981-2002), out of 877 novel

medicines developed, 6% were natural products, 27% derived from natural products and 16% synthetic drugs, elaborated using a natural product as a model. Current published research on medicinal plants is huge, though only a few plants have been studied extensively to reveal their pharmacological activity. Nature remains an important pool for developing new medicines.

The emphasis gradually changed when pharmaceutical companies started to extract medicinal plant compounds. The historical link between plants and human health only began to come apart after the introduction of synthetic acetyl salicylic acid to the world by Frederick Bayer in 1897. In this particular instance, many questions about the mode of action remained unanswered, as no acetylsalicylate or salicylate is naturally present in the willow bark from which it is derived. What is present, however, is salicin, a glucoside from salicylic acid. It is only when the sugar is split off that the alcohol is oxidized to give salicylate (Verpoorte et al. 2006). In this context, traditional plants and ethno-pharmacology have received increased attention (Houghton 1995), with the pharmaceutical industry constantly in search of new biologically active molecules in crude plant extracts to service a general public that increasingly seeks self-medication.

Resistance to antimicrobial and anticancer drugs and their related problems have recently become apparent and this has provided opportunities for the further development of plant-based medicines. Many diseases, like diabetes, heart disease and cancer, are complex and multi-factorial. A single drug molecule or a single genetic factor cannot cure or fix this condition, particularly as the root of the disease lies in an intricate and interrelated combination of genetic, environmental and behavioral factors. In contrast to orthodox biomedical systems, traditional medicinal systems have always taken into account the complexity of diseases and rest on the belief that complex combinations of plant and non-plant products are best to treat these disorders (Razkin et al. 2002).

5.4 A brief history of essential oils

The therapeutic uses of aroma have been known to have been part of traditional medical systems for 5000 years. For example, spices were used for their perfume, flavour and preservative properties while the oils were extensively used for massage, medicine, in food preparation, in embalming the dead and in ritual more generally. In the past, medicinal oils were administered as mouth and throat washes, by inhalation, as

compresses and absorbed internally (Mackinnon and Sawson 2004). During the early European Middle Ages there was a decline in the medicinal use of essential oils, which only regained their status with the Arab invasions.

In Europe, the industrial revolution saw the return of steam distillation of essential oils in the development of food products and perfumes. Researchers of the time, such as Chamberland, Cadeac and Martindale, re-discovered the antiseptic properties of essential oils through experimentation. In the 20th century, Gattefosse and Valnet were the pioneers in aromatherapy. It was Gattefosse who discovered the healing properties of lavender oil and therefore investigated the chemical constituents of essential oils. He worked in close collaboration with doctors and published numerous articles. The term aromatherapy was revived in 1930 and his book *Aromatherapy*, published in 1936. It is still a standard reference today (Zhiri and Baudoux 2005). Gattefosse also worked extensively on the psychological and neurological effects of essential oils, making an important contribution to the holistic concept of aromatherapy practice. Gattefosse together with the physician Valnet made use of essential oils in the treatment of wounds during the Indo-China war (1946-1954), following a shortage of antibiotics (Buckle 2001). Valnet (1964) dedicated his life to the study of essential oils, and initiated phyto-aromatherapy as part of a recognized professional medical practice in France.

Aromatherapy was classed as the fifth most popular complementary therapy in the UK in the 1990s. It has been embraced by other complimentary therapies including acupuncture, osteopathy, and chiropractic, and has found a niche in medical aromatherapy, holistic, aesthetic and psycho-aromatherapy. It is increasingly used in nursing and for care of the elderly (Sheen 2006) in the United States, especially for acute care and long term care (Perez 2003).

5.5 Essential oils in the modern pharmaceutical industry

The utilisation of essential oils in the EU is mainly in food, the perfume industries (fragrances and after-shave) and in the pharmaceutical industry. Essential oils and their antibacterial components are also exploited in various commercial products in dentistry, for instance as tooth canal sealers (Burt 2007). At present, the industry is seeking alternative sources of more natural and environmentally friendly antibacterials, antimicrobials, antibiotics and antioxidants as well as crop agents. Volatile oils show

very complex mixtures of compounds and essential oils are prime agents for these multiple properties (Svoboda and Hampson 1999). In this respect, essential plant oil extracts have attracted a lot of attention because of the combined effects of both active and inactive compounds. Clinical microbiologists are particularly interested in antimicrobial plant extracts. A reason for this is that the likelihood of finding these phytochemicals in the range of antimicrobial drugs is very high. On average, the pharmaceutical industry launches two or three microorganism antibiotics every year. The ability of the plants to synthesize aromatic substances is almost limitless, usually the result of secondary metabolites serving as plant defense mechanisms against predators such as microorganisms, insects and herbivores. Moreover, the arrival of the human immune-deficiency virus (HIV) has triggered intensive interest in effective plant derivatives, particularly because under-developed countries have little access to expensive treatments (Murphy 1999).

Besides their medical applications, essential oils have uses in the food industry because of their antimicrobial, antifungal, antioxidant and radical scavenging properties. They are added to food-related products to avoid lipid deterioration, oxidation and spoilage (Sachetti et al. 2005). Plant aromatics have the ability to influence mental health through their action via the olfactory nerves, and can address very specific clinical symptoms. Their application can improve insomnia and mood regulation. The slow healing of ulcers and chronic skin conditions can respond very well to the use of diluted essential oils. The use of essential oils is therefore recommended to people with diabetes (Buckle 2001a). In addition to its medical applications, the fashionable status of aromatherapy has led to the use of essential oils to enhance living spaces, as well as in products such as odour neutralizers, insect repellants and smoke reducers. Based on the principle that odour stimulates the olfactory pathways to the brain, fragrances are believed to assist relaxation, sensuality, well-being and happiness. Under the label 'Aromachology' essential oils are being combined with textiles and fibre technologies in the production of active wear and leisurewear. The scents are incorporated into the fabrics, and are claimed to address psychological and emotional imbalances (Wang and Chen 2005).

5.6 The development and trade of medicinal and aromatic plants in Morocco

Quite apart from the adoption of decentralised measures, Morocco has signed the American Free Trade agreement and is about to join the 2010 European agreement. In

the context of Euro-Mediterranean trade relations, the European Union is the main trading partner. In 2004, €6 billion of Moroccan exports went to the EU, 62% of these comprised textiles and agricultural products (Melad 2008). Clearly, access to European markets is of prime importance for Morocco given its slower rate of economic growth (Kuiper 2006). It is, therefore, well-placed to take advantage of the growing demand for medicinal and aromatic plants containing essential oils outlined in the preceding sections of this chapter.

Morocco is the ninth largest exporter of medicinal and aromatic plants on a global scale (Ozhatay et al. 1997), and after Turkey is the second most biologically diverse country in term of species in the Mediterranean basin. This biodiversity comprises some 41 ecosystems and 7000 vegetal species of which 4500 are vascular plants. The rich variety of ecosystems, habitats and endemic species is due to its climatic and altitudinal variability. Because of its geographical situation in the Mediterranean basin, rich flora and high endemism, the country offers an important potential for the further production of aromatic and medicinal plants. Six hundred species are listed as having medicinal and aromatic uses and harvested from the wild or cultivated. Commercially, they are used mainly in the pharmaceutical, cosmetic, culinary and food industries (USAID 2006). Morocco currently exports medicinal plants to the value of 300 million dirham, and essential oils to the value of 165 million dirham. Not only does this suggest potential for further development in the industry but it is a promising sector for adding value to otherwise fragile and marginal landscapes, and for providing employment, especially in isolated rural communities. The main species harvested are *Rosemary officinalis* (from which 60 tons of essential oil are extracted and exported), *Thyme* and *Lavender* species, *Artemisia herba alba*, *Mentha pulgemia*, *Origanum compactum* and *Coriander sativum*. Thyme, in particular, of the plants in the traditional pharmacopoeia, is a promising source of antibacterial and anti-inflammatory products. Of the other species of thyme, *Thymus vulgaris thymoliferum* presents a higher antibacterial content than *Thymus satureioides*, which is more concentrated in anti-oxidant and anti-infectious activity (Chorianopoulos et al. 2004). More specifically, *Thymus satureioides* yields an essential oil also called borneol thyme that is indicated in respiratory viral or bacterial chronic infections, arthritis, rheumatism, deep physical and sexual asthenia, cystitis, leucorrhoea, acne and infected wounds. Externally, applications are multiple from local applications for respiratory ailments, locally for dermatitis, and in fumigation for acne and skin trouble (Hyteck 2006).

5.7 The economic value of thyme in the Agoundis valley

The main harvesting of thyme occurs during the summer period. However, other species are also collected from gardens, often during planting or weeding, or at other times during wood collection in the mountains. The drying process is simple, the plants usually being left to dry in the open air, and then stored in a corner of a room, and used medicinally as required. Though Thyme, (*azoukni*), does not quite fall into the category of an ecological or cultural key stone species (Paine 1995; Turner and Garibaldi 2004), nor is it employed in religious ritual in El Maghzen, it has a high social profile because of its wide use in the community, particularly as a medicine and as a source of cash income (Christancho and Vinning 2004).

Thyme is harvested from mid May to mid July (Appendix 3), collectively and by women, who arrange to go up to the mountains in the early morning or late afternoon, usually after four in the afternoon to avoid the heat. Harvesting takes place on the mountain flanks, is not without danger and accidents do happen. The thyme harvest is important for both women and men as there are no other comparable income generating activities in the valley, and although it is only for a couple of months a year it is a valuable contribution to the household economy (table 5.1 and 5.2).

Table 5.1: Percentage female responses to a questionnaire on thyme harvesting (N=140).

Villages	Thyme harvesting is a significant source of money	Thyme harvesting is the only source of money
El Maghzen	96%	4%
Tagdite	93%	7%
Mejjou	92%	8%
Tenfit	91%	9%
Ighir Tazoughart	84%	16%
Tijrichte	83%	17%
Tarbat	100%	X
Ijoukak	84%	16%

Table 5.2: Percentage male responses to thyme harvesting questionnaire (N=114).

Villages	Thyme harvesting is a significant source of money	Thyme harvesting is the only source of money
El Maghzen	82%	8%
Tagdite	87%	13%
Mejjou	86%	14%
Tenfit	82%	16%
Ighir-Tazoughart	84%	16%
Tijrichte	79%	21%
Tarbat	80%	20%
Ijoukak	75%	25%

The amount of thyme by weight (kilograms) collected by both women and men is shown in table 5.3 and table 5.4. Thyme is brought back to the house. From there it is collected at a later stage by middlemen. On market days (either a Tuesday or Wednesday), it may occasionally be taken directly to the souk by the men, or taken straight to the village shop where the middlemen or shop keeper will pay on the spot. On average, harvesters will get between 1 and 2 dirham¹⁶ per kilogram (table 5.5; table 5.6) for the collection of fresh thyme. For women, this generates an income ranging from 1338 to 7822 dirham for a two-month period, and for men, an average income ranging from 3469 to 7962 dirham (table 5.7).

Table 5.3: Quantities of thyme harvested per woman per village per day (Field data 2008).

Villages	Total kgs collected per day per woman	Total kgs of fresh thyme collected per day
El Maghzen	57	1,752
Tagdite	41	736
Tijrichte	79	553
Tenfit	62	435
Tarbat	48	428
Ijoukak	65	390
Mejjou	22	379
Ighir-Tazoughart	50	151

¹⁶ 1 Dirham (Dh, MAD) is equal to £ 0,77 and € 0.091 (April 2010).

Table 5.4: Quantities of thyme harvested per man per village per day (Field data 2008).

Villages	Total kgs collected per day per man	Total kgs of fresh thyme collected per day
El Maghzen	74	1,762
Tijrichte	68	1,223
Tagdite	83	995
Ighir-Tazoughart	68	683
Mejjou	57	681
Tenfit	69	345
Ijoukak	56	224
Tarbat	58	173

Table 5.5: Average price paid in dirham to women for collecting fresh thyme (Field data 2008).

Villages	Average price paid per kg of fresh thyme	Average price paid per day for collection of fresh thyme
Tijrichte	2	130
Ighir-Tazoughart	2	75
Tarbat	2	73
El Maghzen	1	73
Tenfit	1	63
Tagdite	1	52
Mejjou	1	22

Table 5.6: Average price paid in dirham to men for collecting fresh thyme (Field data 2008).

Villages	Average price paid per kg of fresh thyme	Average price paid per day for collection of fresh thyme
Ijoukak	2	133
Tagdite	1	112
El Maghzen	1	104
Tijrichte	1	91
Tenfit	1	66
Ighir-Tazoughart	1	65
Mejjou	1	59
Tarbat	1	58

Table 5. 7: Average income in dirham from fresh thyme over a period of two months (Field data 2008).

Villages	Men	Women
Tijrichte	7963	7822
Ighir-Tazoughart	6738	4526
Tarbat	6222	4360
El Maghzen	5481	4352
Tenfit	3934	3729
Tagdite	3921	3096
Mejjou	3547	1338
Ijoukak	3469	0

0 means 'no thyme'

Sometimes, people will buy food from the store in exchange for the harvest or may get a cash advance from a wholesaler. Other families may keep the thyme at home for longer periods, spread it over the terrace and let it dry in the sun for a few days, turning it over every so often with a fork. It may contain a lot of debris in the dried form and will require further cleaning at a later stage. Although the weight of thyme is less once it has been dried (table 5.8), it is nonetheless a more valuable commodity in the dried form and people tend to sell it for a better price than fresh thyme (tables 5.9 and 5.10). It may also be kept back for future transactions, for when the crop is scarce and will fetch a higher price. Thyme prices may fluctuate greatly depending on availability, as it is highly dependent on rain and other environmental factors (Neffati, Ouled Belgacem and El Mourid 2009).

Table 5.8: Yields of fresh thyme compared with yields of dry thyme per village (Field data 2008).

Villages	Kgs of fresh thyme harvested per women per day before drying	Kgs of thyme after drying	Kgs of fresh thyme harvested per day per men before drying	Kgs of thyme after drying	Average amount of dried thyme sold per women per day	Average amount of dried thyme sold per men per day
Tijrichte	413	75	679	124	9	14
Ijoukak	390	71	206	37	12	12
Tagdite	206	37	301	55	10	6
Tarbat	167	30	173	31	5	6
Tenfit	150	27	150	27	9	9
Ighir-Tazoughart	122	22	683	124	2	10
Mejjou	0	0	152	28	0	6

0 means 'no thyme' for drying.

Table 5.9: Average price in dirham paid per kilogram of dried thyme (Field data 2008).

Villages	Average price paid per kg of dried thyme to Women	Average price paid per day for dried thyme to Women	Average price paid per kg of dried thyme to Men	Average price paid per day for dried thyme to Men
Ijoukak	6	65	4	45
Tijrichte	5	44	4	49
Tagdite	4	22	3	21
Tarbat	4	42	5	29
Ighir-Tazoughart	4	7	3	33
Tenfit	4	34	4	35
Mejjou	0	0	5	25

Table 5.10: Average income in dirham from dried thyme over a period of two months (Field data 2008).

Villages	Men	Women
Ighir-Tazoughart	1994	427
Ijoukak	2684	3900
Mejjou	1487	0
Tagdite	1255	1342
Tarbat	1800	2523
Tenfit	2091	2046
Tijrichte	3000	2629

0 means 'no thyme'

The figures provided in tables 5.5, 5.6, 5.7, 5.8, 5.9, 5.10, however, represent only a small part of the total production as thyme, as it is also collected on a much larger scale by men on the higher slopes, where sage (*Salvia aucheri*) is also to be found and collected. The harvest from these areas is dried in situ, and mounds of dried stems are a common sight. Other villagers from surrounding communities may collect on the same slopes and one or two members of the village will sleep over for a few days to guard the plant material against theft. Indeed, in estimating total production we must also add huge quantities of illegally harvested thyme to that harvested legally by companies who operate under adjudication and which require official stamps from the local authorities in order to export produce from the valley (Montanari 2004). From the interviews I conducted in the villages involved in the thyme distillation project, I have calculated an average of 10.91 tons of fresh thyme per day collected over the eight villages, corresponding to an estimated 660 tons of thyme per season, an average sale of 14, 296, 4587 dirham or € 1,277 or £ 1,132 per day. The amount of dried thyme sold in a day for the eight villages amounts to 628.28kg, with an average price of 4 dirham per kg, and a total of 2817 dirham or €252 or £223 per day. The average price of dried thyme sold in the souk in Marrakech ranges from 60 to 80 dirham a kilogram and can fetch up to 120 dirham.

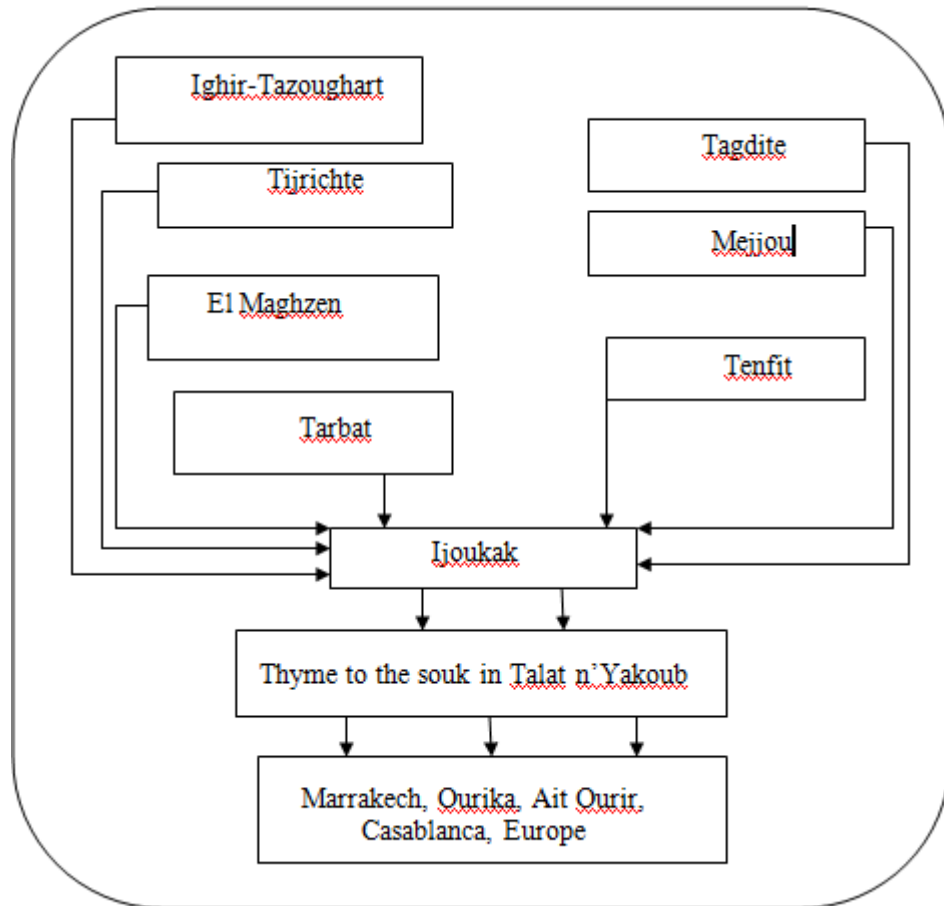
However, the opportunity for large profits not only benefits a handful of middlemen with the means to transport the merchandise (figure 5.1), but especially officials, who are keen not to disrupt this trading arrangement. One of the objectives of the Marrakech-based NGO, CDRT, was to break this cartel with its inequalities and disparities. A second objective was to improve the economic infrastructure (poor road

system, lack of vehicular transport, credit facilities, and vital market information) which inevitably jeopardises marketing potential (Kruijssen and Mysore 2007; Gruère et al. 2007; Van Damme and Scheldeman 2009).

5.8 Adding value

A number of researchers (Gruere et al. 2006; Dhakal et al. 2009; Kruijssen and Mysore 2007a; Van Looy et al. 2008) have identified reasons for the underutilisation of particular plant species in terms of market development. These are the lack of transport and costs linked to external markets, lack of financial resources and handling costs, processing infrastructure, underrated prices and ill-developed market infrastructure and the lack of technical skills and training. However, some communities have managed to overcome these obstacles and to achieve positive outcomes in the plant trade. This is the case, for example for *Prunus Africana* in Cameroon where local communities signed agreements with external companies to ensure sustainable revenues and practices (Ndam and Marcelin 2004). Similarly, in Madagascar, middlemen buy dried *Centella asiatica* from harvesters and are responsible for packaging (Rasoanaivo 2009). Exporters in Namibia pay a percentage to the harvesters for good harvesting practices of *Harpagophytum procubens* (Tonye Mahop 2009; Cole 2009) as is the case for the minor millets in the Kolli Hills of Tamil Nadu, India (Gruère et al.2007a). These cases have in common the full and active integration of local people in either self-help groups or small-scale enterprises, and agreements signed directly between external companies and the communities. Such arrangements have potential for positive financial outcomes at all levels- village, local and national.

Figure 5.1: The connections between thyme producers and the 17 middlemen operating in the Agoundis valley, showing how they converge on the souk in Talat n'Yacoub before reaching the final destination.



5.9 The sustainability of thyme harvesting

In his ecological study on Wijdane mountain near El Maghzen, Kadouiri (2007) collected plant samples from 15 transects ranging from 100 m² to 400 m² and was able to show that thyme was widespread throughout the Agoundis valley up to 2200 metres in altitude, with an average height of 60 cm. Once collected, the plant material was weighed to estimate fresh plant yield (FPY). In the laboratory, the samples were left to dry in the open air and in shade for a period of 15 days to one month and weighed again to estimate the dried aerial plant yield (DPY). The leaves were separated from the stems to weigh, in turn, the dried leaf mass (DLM) and the ligneous mass (LM). Based on the analysed data, the average yield of fresh plant (FPY) and dry plant (DPY) per hectare increased from 174.8 to 226.33 kg and 91.8 to 125.5 kg respectively between the winter (W) and spring (S) seasons. On the other hand, the dried leaf mass (DLM) and the

ligneous mass (LM) increased from 21.83 to 34.52 to 42.7kg and from 42.7 to 66.3 kg respectively (table 5.13). Altitude, position and canopy coverage was shown to strongly influence production.

Table 5.11: Seasonal biomass analysis of *Thymus satureioides*
Source: Kadouiri (2007). See text for key to abbreviations.

Biomass	FPYW Kg/Ha	FPYS Kg/Ha	DPYW Kg/ Ha	DPYS Kg/ Ha	DLMW Kg/ Ha	DLMS Kg/ Ha	LMW Kg/Ha	LMS Kg/ Ha
Average	174.8	226.33	91.8	125.5	42.7	66.3	21.83	34.52
Difference	79.6	100.9	52.3	55.9	29.6	30.9	13.1	13.2

Overall, thyme growing at higher altitudes (above 2000m) and on the exposed South West aspect, where canopy coverage is low (25% <R<50%), is more abundant. On the other hand, for thyme found at mid-altitudes, where canopy coverage is high (>70%), and where there is no exposure, biomass is weak. The availability of thyme at lower altitudes (<2000), with a North to South exposure, and where canopy coverage does not exceed (50 %< R<70%), is average. The average seasonal rates of dry biomass accumulation, that corresponded to an accumulated quantity between two seasons in different parts of the plant biomass is higher at low and medium altitudes than at high altitudes. This difference is due to the degree of coverage, that is less in areas of low altitude (with a strong degradation of stratified tree coverage), which makes the environment more open and drier. The lower ligneous zone dominated by thyme is therefore more important and drier. On the other hand, at high altitudes, despite the openness of the environment, the tufts of thyme are wetter because of water retention caused by the degree of moisture and snow. The production yield of leaves after drying is greater at low and medium altitudes. The average production of thyme gives a foliar biomass that increases between 21 kg/ha in winter and 34.5 kg at the end of spring.

In all the villages studied, the harvesters were well aware of the problem of thyme sustainability. Most villagers were aware of the harvesting-extraction procedure and its consequences for the plant sustainability. Most of them stated that they did not extract whole plants, and that they were only cutting the tops. They understood that roots should be left in the ground to allow the plant's regeneration for the following year. A handful of adults in El Maghzen (3%) admitted that they removed the whole

plant to maximise production. Five percent of women in Tagdite and 20% of men in Tarbat stated that removal of the whole plant was forbidden. Seventeen percent of women in Tijrichte stated that middlemen would not buy if they saw that the roots had been pulled out. Eight percent of men in Tagdite said that the Department of Water and Forestry would fine them if they saw that the roots were missing (tables 5.12 and 5.13).

The results of the plot transects (table 5.11) indicate that the harvest needs to take place at strategic points on the mountains, and particularly at higher altitudes, because of the climatic conditions affecting its regenerative abilities. The villagers showed a strong concern about climatic conditions affecting thyme availability because they tend to collect the bulk of the harvest at higher altitudes. Clearly, the harvest of thyme is economically important for the villagers (tables 5.1 and 5.2), but my results indicate that there is a genuine concern about the plant sustainability. Overall, people therefore harvest in a way to maintain availability rather than succumbing to pressure from the Department of Water and Forestry (tables 5.12 and 5.13).

Table 5.12: Women’s agreement responses to questions on thyme harvesting methods: a comparison between villages

	El Maghzen	Tagdite	Mejjou	Tenfit	Ighir- Tazoughart	Tijrichte	Tarbat	Ijoukak
If entire plant is removed there will be no harvest the following year	24%	30%	41%	25%	40%	37%	50%	50%
If the tops are cut this will ensure that the plant grows back the next year	73%	65%	59%	75%	60%	46%	50%	50%
Removal of the entire plant will maximize my income	3%	0%	0%	0%	0%	0%	0%	0%
Removal of the entire plant is forbidden	0%	5%	0%	0%	0%	0%	0%	0%
If entire plant is removed middlemen will not want to buy	0%	0%	0%	0%	0%	17%	0%	0%
If Water & Forestry see that entire plants have been harvested they will fine us	0%	0%	0%	0%	0%	0%	0%	0%

Table 5.13: Men’s agreement responses to questions on thyme harvesting methods: a comparison between villages

	El Maghzen	Tagdite	Mejjou	Tenfit	Ighir- Tazoughart	Tijrichte	Tarbat	Ijoukak
If entire plant is removed there will be no harvest the following year	38%	13%	50%	0%	8%	47%	40%	100%
If the tops are cut this will ensure that the plant grows back the next year	59%	79%	50%	80%	92%	53%	40%	0%
Removal of the entire plant will maximize my income	3%	0%	0%	0%	0%	0%	0%	0%
Removal of the entire plant is forbidden	0%	0%	0%	0%	0%	0%	20%	0%
If entire plant is removed, middlemen will not want to buy	0%	0%	0%	0%	0%	0%	0%	0%
If Water & Forestry see that entire plants have been harvested they will fine us	0%	8%	0%	20%	0%	0%	0%	0%

5.10 Conclusion

The aromatic and medicinal plant trade industry is a lucrative business in Morocco and worldwide. Equally, the trade in thyme from the Agoundis valley makes a significant contribution to the national economy. The income from thyme is important for the villagers, as it makes a significant contribution to the overall annual household budget. However, this income is derisory compared to the huge profits that the marketing companies make. The differing profit margins found in the trade suggest that there is potential for local people to improve their revenues through some entrepreneurial scheme. Further, considering the quantities of thyme exported from the valley at the end of each harvesting season, it is hard to believe that plant sustainability has yet impacted on production. The equipment used is poor and the plants may not be harvested in ways that would best ensure their reproduction, but there is awareness of the importance of ensuring plant reproduction for the household revenue. It would seem that people are not only aware of sustainability issues but also are particularly concerned about its availability in the context of changing climatic conditions.

CHAPTER 6

The Ethnobotany of Medicinal and Aromatic plants in El Maghzen and their Potential for Development

6.1 Introduction

The Agoundis valley is botanically rich, and particularly abounds in aromatic and medicinal plants (Appendix 2). These are not only widely used in traditional medicine but also contribute significantly to the economy of the household. Aromatic plants are widely used in the cosmetic and pharmaceutical industries worldwide. They have the potential of adding value to small-scale enterprises, particularly in the form of essential oil distillation. Many of the medicinal plants that are used in traditional medicine can be further developed as packaged dried herbal mixtures. The current trade in aromatic plants from the Agoundis valley mainly supplies large distillation companies based in Casablanca or Marrakech (Montanari 2004). The national and international market demand is important. In this chapter, I demonstrate that aromatic and medicinal plants, as well as a few other natural resources of El Maghzen, have the potential to add value to local enterprises. Moreover, traditional phytomedicine is the only source of treatment in El Maghzen as there is no dispensary or other medical facilities. Of particular interest in El Maghzen for their essential oils are Thyme (*Thymus satureioides*), Lavender (*Lavandula dentata*) and Sage (*Salvia aucheri*), although other plants may be included in packaged dried herbal mixtures.

6.2 Thyme

Although thyme is an endemic aromatic plant that can be found widely distributed in the Mediterranean region, it has been estimated that about 350 species of the genus *Thymus* can be found across the world. These vary widely in phytochemical composition and possess multiple biological effects, including antispasmodic, antibacterial, antifungal, anti-tabagic, giardicidal and anti oxidant properties (Jafaari et al. 2007). The commercial significance of *Thymus* is mostly associated with the essential oils contained in the plant, the oleoresins, and with the fresh and dried herbs, and in plants for landscaping. According to Lawrence and Tucker (2002:252), out of

350 species, -only five have demonstrated real economic value, i.e. *Thymus capitata* L. (Spanish oregano or cone head thyme), *T. mastichina* L. (Spanish marjoram or mastic thyme), *T. serpyllum* L. (wild thyme, mother of thyme), *T. vulgaris* L. (common thyme), and *T. zygis* L. (Spanish thyme). These oils have gained a commercial value in natural cosmetics and phyto-cosmetics, which is one of the fastest growing niche markets. Although every species is commercialised in one way or another, oil is mainly extracted from *T. zygis* and the main sources of dried and fresh plant material come from *T. vulgaris*.

What makes aromatic plants so exceptional is that essential oils are a toxic waste product of plant metabolic processes. The traditional view was that these substances were useless to the plant. The belief is now that these waste products are important plant defence mechanisms that also act as active repellents to leaf insects. They are therefore instrumental for disease prevention and defence against microbial attacks. The essential oils themselves, and particularly those of the Lamiaceae (or Labiatae) family, to which thyme belongs (Stahl-Biskup 2002), are now much in demand in the cosmetic, perfume and pharmaceutical industry, and for medicinal purposes. The Labiateae family is a common source of antibacterials, anti-inflammatories and antioxidants worldwide, and the genus *Thymus* is used for these purposes in traditional pharmacopeias. The essential oils, which are mainly found in the flowering stems of the plant (Hmamouchi 2001), are rich in borneol (with high antimicrobial agents), flavonoids (derived from apigenol and luteolol), phenolic acids (particularly caffeic and rosmarinic), tannins, resins and other rich chemical compounds responsible for the majority of these pharmacological effects. Within the sphere of anti-infectious agents, *Thymus* is bioactive in other ways too. Studies conducted on *Thymus satureioides* essential oil reveal important radical scavenger actions and their potential antibacterial properties. These are particularly effective against Gram positive¹⁷ and Gram-negative bacteria (Berkow 1987:77). Whereas other species of thyme, such as *Thymus vulgaris* (particularly the sub species *thymoliferum*) present higher antibacterial content than *Thymus satureioides*, this latter

¹⁷ Gram-positive bacteria resist the stain or decolourisation of alcohol in Gram's method of staining indicating a cell wall –composed of peptidoglycan and telchoid acid. In contrast, Gram-negative bacteria lose the stain or decolourisation with the addition of alcohol, thereby indicating a cell wall surface more complex in chemical composition than the Gram-positive bacteria (Dorland 1982:305).

field of action is more concentrated on antioxidant activities (Chorianopoulos et al. 2004). More specifically, *Thymus satureioides*, also called ‘borneol thyme’, is indicated in respiratory viral or bacterial chronic infections, arthritis, rheumatism, deep physical and sexual asthenia, cystitis, leucorrhoea, and externally for acne, infected wounds, dermatitis and other skin problems (Hyteck 2006). Further research on the aqueous extract of *Thymus satureioides* has shown that its analgesic action is more potent than acetyl salicylic acid (ASA), acting through an opioid-mediated mechanism (Elhabazi et al. 2008).

6.2.1 *Thymus satureioides*: compounds of interest

Endemic species of Moroccan Thyme (*Thymus satureioides*, *Thymus broussonettii*, *Thymus maroccanus*, *Thymus leptobotrys* and *Thymus algeriensis* (all species endemic to the Maghreb) have recently received much attention (Elhabazi et al. 2008a). Carvacrol, thymol and borneol are major constituents of interest found in Moroccan thyme (table 6.1; plate 6.1). It is carvacrol that gives thyme its antioxidant properties, a phenolic structure present in various concentrations of thyme essential oil. Three chemotypes are present in Moroccan *Thymus satureioides*, namely borneol (Ts3), borneol/ thymol (Ts2) and borneol/carvacrol Ts1. By comparison, *Thymus broussonettii* yields carvacrol (Tb1) and with thymol/borneol (Tb2) chemotypes. The components are the same in *Thymus algeriensis* but vary in proportion. It is carvacrol and thymol that give thyme its antioxidant properties, and the phenolic structures present in various concentrations of thyme its essential oils.

Besides these important chemical constituents, Jafaari et al. (2007a) have identified 130 components in *Thymus satureioides*. This is comparable to other species, -such as *Thymus pallidus* and *Thymus algeriensis*. These compounds are present in the oil of all three species, but the amounts may vary considerably depending on geographical situation, climate, soil, harvesting period, and methods of preservation and extraction. Genetic factors and vegetative cycles may further influence the amounts of these compounds present and the number of chemotypes. Thyme species not only have powerful antioxidant properties but important antibacterial properties as well. Owing to the presence of phenolic agents, thyme essential oil has a direct inhibiting action on pathogenic bacterial strains such as *Echerichia coli*, *Salmonella enteritidis*, *Salmonella choleraesuis* and *Salmonella typhimurium* (Penalver et al. 2005), and is widely used in food protection against decay and bacteria. This antibacterial activity further extends to

a wide spectrum of pathogenic bacterial strains including *Listeria monocytogenes*, *L. innocua*, *Salmonella typhimurium*, *Escherichia coli* O157:H7, *Shigella dysenteriae*, *Bacillus cereus*, *Staphylococcus aureus* and *Salmonella typhimurium*. A high content of carvacrol and thymol strongly inhibit Gram-positive more than Gram-negative pathogenic bacteria (Nevas et al. 2004; Edris 2007).

Braga et al. (2006) point out that inflammation is closely related to oxidative stress. Antioxidant properties that act as protecting agents during the oxidative deterioration of alimentary lipids are increasingly being studied and are sought after as a mean of limiting disease associated with oxidative stress and the damage that it triggers. Because of the high content of anti-inflammatory, and flavonoid constituents¹⁸ in *Thymus satureioides*, these antioxidant and free radical scavenging activities have proved valuable in the treatment of some pathological conditions (Ismaili et al. 2004). From a pharmacological point of view, these findings are highly relevant because the antioxidative and anti-inflammatory actions of thymol have the potential to be transferred to human cells. Although currently the main use of thyme derivatives is in phytotherapeutic mixtures, lotions, creams and ointments, its potential for treating inflammatory processes presents a new area for appropriate clinical tests.

6.2.2 The analysis of *Thymus satureioides* essential oil distillate

One sample of *Thymus satureioides* was collected on Wijdane Mountain in El Maghzen on 30 May 2008. The dried milled aerial parts of *Thymus satureioides* were used for the study described in this chapter. The plant was distilled at the Chemistry Department at the Faculty of Sciences, Cadi Ayyad University in Marrakech. The analysis of the oil was performed at the Laboratoire de Biotechnologies végétales appliquées aux plantes aromatiques et médicinales at the Jean Monnet University at St Etienne, France.

Dried leaves of *Thymus satureioides* (1kg) were steam-distilled for 24 hours in a 20-litre distillation flask fitted with an oil estimator. A light amber coloured oil (2.73 ml, w/dry weight) was obtained. The essential oil sample was diluted 1/50 with hexane

¹⁸ Flavonoids are phenolics and non-volatile. They do not appear in steam-distilled oils. They are however major constituents in herbal infusions. Thymol and carvacrol are naturally oxidised terpenes that become phenolics by virtue of the benzene ring (Personal communication, Leach 2010).

and injected with a 1:200 split (GC and MS operating conditions). The distilled oil revealed 24 compounds. Although the carvacrol content (18.05%) and thymol (0.46%) seemed to be lower than in other thyme species, it was typical of the carvacrol-thymol chemotype. However, the borneol content (32.89%) is higher than the other *Thymus satureioides* analysis described above (table 6.1).

Table 6.1: Phyto-chemical composition of *Thymus satureioides* from the El Maghzen
Source: Laboratoire de Biotechnologies végétales appliquées aux plantes aromatiques et médicinales, Université Jean Monnet, St Etienne, France.

Peak N°	<i>Thymus satureioides</i> El Maghzen Area%	KI Calc	Compounds	ID	<i>Thymus satureioides</i> (table 1.Jafaari et al. 2007)
1	0.27	928	tricyclene		-
2	0.30	930	a-thujene		
3	5.62	938	a-pinene	Lit, KI, MS, Ref	
4	11.00	955	camphene	Lit, KI, MS, Ref	0.58
5	0.05	958			
6	0.71	982	β -pinene	Lit, KI, MS, Ref	T
7	0.23	990	myrcene	Lit, KI, MS, Ref	-
8	0.06	997			
9	0.31	1020	a-terpinene	Lit, KI, MS, Ref	0.37
10	4.15	1028	p-cymene	Lit, KI, MS, Ref	2.17
11	0.41	1033	limonene	Lit, KI, MS, Ref	-
12	0.06	1035			
13	1.74	1061	g-terpinene	Lit, KI, MS, Ref	0.37
14	0.07	1087			
15	3.65	1100	linalool	Lit, KI, MS, Ref	30.03
16	0.31	1150	camphor	Lit, KI, MS, Ref	0.48
17	32.89	1175	borneol	Lit, KI, MS, Ref	30.03
18	1.81	1182			
19	0.27	1190			
20	0.13	1191			
21	7.07	1195	a-terpineol	Lit, KI, MS, Ref	-
22	0.27	1197			
23	0.27	1230			
24	0.82	1240	methyl carvacrol	Lit, KI, MS, Ref	-
25	2.39	1284	bornyl acetate	Lit, KI, MS, Ref	1.73
26	0.46	1289	thymol	Lit, KI, MS, Ref	0.94
27	18.05	1296	carvacrol	Lit, KI,	35.90

				MS, Ref	
28	0.09	1302			
29	0.08	1312			
30	0.23	1375	a-copaene	Lit, KI, MS	T
31	5.13	1417	caryophyllene	Lit, KI, MS	0.16
32	0.09	1454	a-humulene	Lit, KI, MS	-
33	0.17	1510	g-cadinene	Lit, KI, MS	-
34	0.46	1515	d-cadinene	Lit, KI, MS	0.48
35	0.15	1578	caryophyllene oxide	Lit, KI, MS	0.51
36	0.15	2462			
37	0.10	2463			

Key: Peaks are detected signals when a compound eludes from the GC column into the detector (<http://www.gmu.edu/depts/SRIF/tutorial/gcd/gc-ms2.htm>). KI= published Kovats retention index (e.g. Adams); MS= good match (>95%) with reference mass spectral libraries (e.g. Wiley, Adams etc); Ref= pure reference standard where available and where it has been injected previously for KI and MS confirmation; T= trace less than 0.1%. Note that international journals now require the ID column and the inclusion of the methods used to identify each component as well as the literature previously published constituent for the oil.

6.2.3 Thyme in traditional medicine

Moroccan Thyme species, - *Thymus satureioides*, *Thymus broussonettii*, *Thymus maroccanus*, *Thymus leptobotrys*, *Thymus willdenowii* (all endemic to Morocco) and *Thymus algeriensis* – have all been used in Moroccan traditional medicine (Jaafari et al. 2007b; Elhabazi et al.2008b). Beside their tonic and stimulant properties, the main applications are in the treatment of diarrhoea, fever, coughs, and topically in the treatment of infected skin areas and wounds, cutaneous ulcers, and various types of dermatitis (Bellakhdar 1996; Sijelmassi 1993; Ismaili et al. 2001; 2002; 2004). More precisely, thyme has been used and appreciated for its positive effects, i.e. for its nervous tonic and general stimulant properties, producing a euphoric effect, which may be useful to fight off depression, anxiety and insomnia. The application of thyme in massage relieves sciatica, arthritis, lumbago, gout, neuritic and rheumatic types of pain (Valnet 1964). Thyme is employed for the oxygenation of the scalp, improving the blood flow through regeneration of capillary glands and circulation to capillaries, thereby renewing blood flow and preventing baldness and alopecia. Similarly to Ti-tree (*Melaleuca alternifolia*) in its anti-inflammatory and antiseptic properties, thyme applied topically in the correct dilution proportions, speeds up the healing of wounds

and inflamed skins because of the increase of blood flow stimulated by further oxygen and nutritional substances. Typically, species of thyme such as *Thymus satureioides*, *Thymus willdenowii* from Morocco, have further revealed the presence of major constituents, including a number of flavonoid derivatives of luteolin and eriodictiol, both rare in the Labiatae, as well as rosmarinic acid. Extracts of *Thymus* are added as ingredients in anti-ageing creams as inhibitors of collagenase. As a natural source of potent anti-inflammatory pharmacophores and antioxidants, cosmetic manufacturers use *Thymus* extracts as an active ingredient (Aquino 2002). *Thymus* therapeutic applications extend to the digestive and respiratory systems. Further actions relieve gastro-intestinal disorders, facilitating dyspepsia (slow digestion), colic, fermentation, flatulence, diarrhoea, gastritis and gastric ulcers. In terms of respiratory ailments, thyme has powerful expectorant, spasmolytic and antiseptic properties, exerting a strong action for colds, flu and sinusitis, bronchitis in its acute and chronic forms, tuberculosis and a soothing action over irritable, convulsive coughs (Zarzuelo and Crespo 2002).

In the Agoundis valley, local people typically refer to *Thymus satureioides* (plate 6.1) as *azoukni* in Tachelhit. This name is used for the male plant characterised by its purple flowers, as opposed to the female plant that is called *tazouknit* (*Thymus pallidus*) which has white flowers. Some women were embarrassed to use the word *azoukni* as it refers to the male part of the thyme plant and presumably has human sexual connotations. *Azoukni* is taken regularly, that is more or less on a daily basis, as a fresh herbal tea infusion during the harvest season (mid May to mid July) or outside the harvesting season in the dried herb form. The dried herb is powdered and taken regularly by women for painful menses, to relieve gastric disorders (stomach ache, bile complaints, indigestion, intestinal trouble), and respiratory disorders such as colds, coughs, chills and headache because of its warming character. However, people have cautioned that it should not be taken over long periods of time as it will damage teeth and gums precisely because of its warming character.

Plate 6.1: Azoukni (*Thymus satureioides*)

Source: B. Montanari (El Maghzen, June 2008)



6.3 Lavender

The species of interest in the Agoundis valley are *Lavandula dentata*, which is profusely distributed around El Maghzen, and to a lesser extent, *Lavandula multifida*, which can also be found throughout the valley. *Lavandula* is a member of the Nepetoideae subfamily in the Labiaceae (Lamiaceae) family. According to Upson (2002), 32 different species of *Lavandula* have been described in the literature, with a number of extra species in infraspecific hybrids and taxa. Numerous sub-species and their hybrids are cultivated worldwide for horticulture. The genus is widely distributed throughout the Canary Islands, Madeira and Cape Verde Islands, across the Mediterranean Basin, North Africa, South West Asia, the Arabian Peninsula and tropical North Africa and as far as India. Perhaps best known for its popular use in the perfume industry, lavender also has a long history of medicinal use. The name *Lavandula* is derived from the Latin word Lavare meaning to wash, as the plant was used mainly to perfume bath water. Chu and Kemper (2001) recognise that at least five different species are used medicinally, each presenting different medicinal properties. It is the essential oils extracted mainly from *L. intermedia* and *L. augustifolia* that are of economic importance in the perfume and fragrance industries. *L. latifolia* and *L. hybrida* (*L. latifolia* x *L. augustifolia*) are used to produce spike lavender oil and lavandin oil (Harbone and Williams 2002).

Lavender has regained much interest in recent years in aromatherapy, but early records of its distillation and use go back as far as ancient Egypt and it was widely used four to five thousand years ago by Chinese and Arabs (Castle and Lis-Balchin 2002). Today, the main use of lavender is for perfumes, soaps, bath and talc powders and candles and herb sachets. In aromatherapy, its main applications are on the nervous system, to relieve stress conditions, helping with depression and fatigue, to treat colic and stimulate appetite and induce relaxation. Buchbauer (2002) adds that the use of lavender in aromatherapy affects moods positively, raises the alertness of EEG patterns and mathematical computations, and promotes sleep. Its action on the nervous system is so powerful that its application is cautioned for people suffering from seizure disorders and using sedative medications (Chu and Kemper 2001a). *In vitro*, lavender oil has shown antimicrobial activity against bacteria, fungi and some insects (Kim and Lee 2002). Its spasmolytic activity in smooth muscle *in vivo* supports its historical use as a digestive aid. Although *Lavandula* does not possess potentially powerful antioxidants such as thyme or other plants of the Labiateae family, it presents nonetheless potent anti-carcinogenic, analgesic and anti-allergic properties.

6.3.1 *Lavandula*: compounds of interest

What gives lavender its bioactive properties are its phenolic constituents. Although the essential oils of lavender species have similar properties and share major chemical constituents, these may vary greatly depending on the geographical situation and other factors. Lavender essential oil seems to vary the most in qualitative composition (Harbone and Williams 2002a). Imeliouane et al. (2009) performed distillation of *Lavandula dentata* from Taforalt, Talazart, and eastern Morocco. They identified 29 compounds with effective antibacterial properties and activity on 22 bacteria strains included in the study, with the exception of *Pseudomonas aeruginosa*. The presence of major monoterpenoid agents are thought to give the plant its antimicrobial activity to which the 22 types of bacteria analysed by Imeliouane and his colleagues responded radically. However, some oils at certain concentrations appear to be bacteriostatic rather than bactericidal, i.e. they prevent growth rather than killing the bacteria (Cavanagh et al. 2003). For instance, 19 flavones and eight anthocyanins have been identified in the plants, mostly represented by linalool, linalyl acetate, 1, 8-cineole, β -ocimene (usually both *cis*- and *trans*-terpinen-4-ol) and camphor in most species. An illustration of this variation is *Lavandula multifida*, which yields large numbers of carvacrol and

bisabolene compounds, where as *Lavandula dentata* presents a high percentage of 1, 8 cineole and β pinene. *Lavandula dentata* essential oil has been identified as a prime agent indicated in the preservation of traditional foods, keeping at bay the growth of food-borne pathogens and other spoilage bacteria, an important contribution to the safety of food. Apart from its anti-bacterial and anti-diabetic properties (Jouad et al. 2001; Bnouham et al. 2002) widely used in Morocco (Jarald et al. 2008), it has recently attracted much attention for its potential anti-cancer properties with the focus on perillyl alcohol and other significant metabolites of d-limonene. These are currently under investigation for their chemo-preventative and chemotherapeutic actions (Buchbauer 2002a).

6.3.2 Analysis of *Lavandula dentata* essential oil distillate

For the study described in this chapter, one sample of *Lavandula dentata* was collected on Wijdane Mountain in El Maghzen during May 2008. The dried milled aerial parts of *Lavandula dentata* were used. Dried flowers of *Lavandula dentata* (1kg) were steam-distilled for 24 hours in a 20-litre distillation flask fitted with an oil estimator. A light yellow coloured oil (6.78 ml, w/dry weight) was obtained. The chromatographic analysis was performed at the Laboratoire de Biotechnologies végétales appliquées aux plantes aromatiques et médicinales at the Jean Monnet University at St Etienne, France. The essential oil sample was diluted 1/50 with hexane and injected with a 1:200 split (GC and MS operating conditions). The chromatographic analysis of essential oils for *Lavandula dentata* revealed 31 peaks (compounds) positively identified compared to the study conducted by Imeliouane et al. (2009a) that revealed 29 compounds. *Lavandula dentata* essential oil from El Maghzen contained a low level of 1, 8 cineole (11.48%) compared to Imaliouane's study which reported 41.28%. However, *Lavandula dentata* from El Maghzen contained a high yield of camphor (64.20%) compared to 1.48% for *Lavandula dentata* found in Taforalt, Talazart. Therefore, *Lavendula dentata* from El Maghzen seems to be of a 'camphor' chemotype. This high yield may be specific to the valley (table 6.2).

Table 6.2: Phytochemical composition of *Lavandula dentata* from El Maghzen

Source: Laboratoire de Biotechnologies végétales appliquées aux plantes aromatiques et médicinales, Université Jean Monnet, St Etienne, France. Note : For key to abbreviations used see table 6.1.

Peak N°	<i>Lavandula dentata</i> El Maghzen Area%	KI Calc	Compounds	ID	<i>Lavandula dentata</i> (Imeliouane et al.2009)
1	1.06	938	□-pinene	Lit, KI, MS, Ref	4.05
2	1.18	955	camphene	Lit, KI, MS, Ref	0.78
3	0.11	976	sabinene	Lit, KI, MS	13.89
4	2.80	982	□-pinene	Lit, KI, MS, Ref	-
5	0.13	990	myrcene	Lit, KI, MS, Ref	-
6	0.73	1028	p-cymene	Lit, KI, MS, Ref	0.46
7	2.06	1033	limonene	Lit, KI, MS, Ref	-
8	11.48	1036	1,8-cineole	Lit, KI, MS, Ref	41.28
9	0.81	1091	fenchone	Lit, KI, MS	-
10	2.22	1100	linalool	Lit, KI, MS, Ref	2.76
11	0.12	1129			
12	0.43	1144			
13	64.20	1152	camphor	Lit, KI, MS, Ref	1.48
14	0.26	1165	pinocarvone	Lit, KI, MS	1.76
15	1.94	1174	borneol	Lit, KI, MS, Ref	2.84
16	0.65	1187			
17	0.98	1195	myrtenal	Lit, KI, MS	2.75
18	0.27	1244			
19	0.16	1245			
20	0.40	1296	carvacrol	Lit, KI, MS, Ref	-
21	0.17	1330			
22	0.25	1417			
23	0.18	1432			
24	1.45	1486	b-selinene		-
25	0.20	1506			
26	0.85	1508			
27	0.19	1517			
28	1.95	1578	caryophyllene oxide	Lit, KI, MS	-
29	0.86	1651	b-eudesmol		0.45
30	0.26	1683	a-bisabolol		-
31	0.12	1744			

In El Maghzen, the flowers of *Lavandula dentata* (plate 6.2) or *timzuria* in Tachelhit are used extensively along with other herbs in tea, coffee and in infusion. Its main applications are for headaches, stomach ache, including painful menses and gynaecological problems, stomach acidity, bile problems, vomiting, loss of appetite, colds, chills, coughs, rheumatism, dampness in the body, high blood pressure. Women add *timzuria* for its fragrance to henna mixtures either for tattooing or for hair colouring. It tends to be extensively collected for cow fodder.

Plate 6.2: Timzuria (*Lavandula dentata*)
Source: B. Montanari (El Maghzen, June 2008)



6.4 Sage (*Salvia aucheri*)

Another aromatic plant of interest in the Agoundis valley is *Salvia aucheri*. It is endemic to the High Atlas (Taleb and Fennane 2008). Of the Lamiaceae family, *Salvia* is the largest and the most important genus with a distribution of about 900 species worldwide. Sage has been used as an important medicine since the earliest times and has been extensively documented back to the Roman era, particularly *Salvia officinalis*. The name *Salvia* comes from the Latin ‘Salvus’ meaning safe. Traditionally, the various species of sage have been applied in skin and hair care, as an antifungal, to treat skin conditions in bathing and washing, for wound treatment and rheumatism, for varicose and leg conditions, for nervous and mental conditions, to stop milk production in nursing mothers and for feet and pedicular problems (Dweck 2000). In El Maghzen, the vernacular name for the two available sages, *Salvia aucheri* and *Salvia officinalis*, grown in gardens, is *salmia*. More than a decade ago, *Salvia aucheri* used to be

profusely abundant within the vicinity of the village. Because of overharvesting, it is now only found at higher altitude on mountain slopes. Its collection occurs at the same time as *azoukni* (*Thymus satureioides*), when villagers spend most of the day collecting the plants in the mountains. It is often used in tea or coffee in combination with other plants. Its main applications are for stomach and intestinal discomfort, backache, to improve circulation, for vertigo, diabetes, against vomiting, and it has a relaxing effect on the gall bladder. As with thyme, people have warned that it should not be used excessively because of its warming character.

6.4.1 *Salvia*: compounds of interest

Salvia species and their derived essential oils are widely used in the food, drug, cosmetic and perfumery industries as flavourings or fragrance and for medicinal purposes. Apart from their inclusion in many pharmacopoeias, for alimentary, pharmacological and other cosmetic purposes (Bagci and Kocak 2008), *Salvia* species have a huge potential in food preservation and the prolongation of stable storage, as a safer alternative to side effects such as butylated hydroxytoluene¹⁹ (BHT) and butylated hydroxyanisole (BHA) derived from synthetic antioxidants (Kelen and Tepe 2008). In Turkey, *Salvia*, and particularly *Salvia aucheri*, also known as ‘garden sage’ is commonly used in tea and applied externally as an antiseptic, for nose and ear complaints, and for its stimulant and anti-flatulent properties (Ozcan et al. 2003). *Salvia* presents rich sources of polyphenolic flavonoids and phenolic acids, unique to the genus (Lu and Foo 2002), and has a high content of useful secondary metabolites, including terpenes and phenolics and their derivatives. Other major compounds of *S.aucheri* var. *aucheri* oil are 1, 8 cineole (30.5%), camphor (21.3%) and borneol (8.50%). Further,

¹⁹ Industrial food producers use antioxidants such as butylated hydroxytoluene (BHT) and butylated hydroxyanisole (BHA) extensively. Although harmless in small dosage and generally recognised as safe additives to food products, the excess of such concentrations can produce extensive damage, such as pathological, enzyme and lipid alterations when tested in both rodents and monkeys. In some cases, butylated hydroxytoluene, has been reported to have certain teratogenic and carcinogenic effects on rodents and the proliferation of pulmonary changes characterized by increased DNA, RNA, and lung weight as well as the promotion of urinary bladder carcinogenesis when tested in rats (Branen 1973; Adamson et al. 1977; Imaidi et al. 1983).

Salvia aucheri, when analysed by gas chromatography, has revealed a high percentage of camphor, which has an important role as a local anaesthetic, and is used widely for rheumatic conditions, muscular strains and similar inflammatory conditions (Digrak et al. 1999). When used internally, it has a marked action on the circulation and as a calmative (Demirci et al. 2003). Other reputed spheres of action for *Salvia* are beneficial effects on memory disorders, depression and cerebral ischemia. However, one of the most promising and interesting features of *Salvia* is in the treatment of Alzheimer's disease (AD) and dementia (Perry et al. 2003). According to Ohran et al. (2007), *Salvia* species and *Salvia aucheri* essential oils and other major components, such as terpenoids and monoterpenes, have demonstrated uncompetitive and reversible acetylcholinestase inhibitory action on cellular damage caused by the oxidation of biomolecules. Thorough investigations have been undertaken on the species for their antioxidant actions on major pathological neurodegenerative processes and other cognitive deficits of cerebral aging processes that are a feature of Alzheimer's and Parkinson's disease.

6.5 Other plants and resources with potential for development in the Agoundis valley

Benaboubou (2004) has illustrated more than 60 plants in the Agoundis valley, many of which are endemic and other which are cultivated in gardens (Appendix 6). The plants are a major part of life and consumed on a daily basis, most commonly in tea, coffee, infusions and other preparations to bring comfort for common ailments. A few of these endemic plants show potential for development in essential oil distillation or conditioned as dried herb sachets. Of particular interest are *timija* (*Mentha rotundifolia*), apple mint; *fliyyo* (*Mentha pulgemia*), spearmint; *ija oumghar* (*Inula montana*), elecampe; *shich* (*Artemisia herba alba*), wormwood; *ifzi* (*Marrubium vulgare*), horehound; *azouka* (*Tetraclinis articulata*), thuya; *tirka* (*Globulum aylum*); *taroubi* (*Rubia peregrina*), madder; *mhinza* (*Chenopodium ambrosoides*), wormseed; *irguel* (*Cistus salviifolius*), and *soussban* (*Iris germanica*), iris. The latter grows rapidly, is easily propagated and does not require much maintenance. Other useful plant resources in El Maghzen include fruit and nuts: *tikida* (*Cerotonia siliqua*), carob pods, which are already exploited on a small scale; *ukzern* (*Ficus carica*), figs; *aknaria* (*Opuntia megacantha*), Barbary figs; *tylilout* (*Capparis spinosa*), capers; *taroumant* (*Punica granatum*), pomegranate; *luz* (*Prunus amygdalus* var *dulcis*), almonds, and *tarkayin*

(*Juglans regia*), walnuts, which grow profusely in El Maghzen and can be conditioned and sold in the dried form. A golden oil is extracted from the local olive trees and although this is kept for household consumption, it can be sold on a small scale.

6.5.1 Artemisia

Artemisia (*Artemisia herba alba*), *shich* in Tachelhit, belongs to the Asteraceae family. It is found profusely in the valley, particularly around Ijoukak. Artemisia is widely used in Moroccan traditional medicine. In El Maghzen, it is mainly used for colds, lung complaints, stomach and intestinal discomfort, vomiting, vertigo, bile complaints, headaches, facial spots and tooth ache, especially after extraction. The whole plant without roots is often used in tea or coffee. It is also applied as a powder for facial spots. It has other uses as a vermifuge, emmenagogue, diuretic, intestinal tonic, cholagogue and anti-diabetic. An essential oil is extracted, of which the main components are thuyone, camphor and flavonoids, varying in chemotypes according to the geographical situation. The plant is, however, toxic in strong dosages and can provoke vertigo and convulsions (Belhkadar 1996).

6.5.2 Chenopodium

Chenopodium (*Chenopodium ambrosoides*) or *mhinza* in Tachelhit (Appendix 2; plate 2.4), belongs to the Chenopodiaceae, and is widely distributed on river banks. The leaves mixed with water or onions are applied to the head for headaches and fever, particularly for children's ailments. The dried powdered leaves are drunk with a little water for migraine, and the juice extracted from the leaves and mixed with orange juice is drunk for fever and stomach aches. The juice is a very sticky and potent plant medicine which local people know exactly how to administer as it is also given to children. A well known use for Chenopodium is as a vermifuge, acting as a very active anthelmintic for the expulsion of round worms, especially in children. For this purpose, the whole plant is employed (Leyel 1980). Chenopodium yields an essential oil which can be toxic especially for children. The symptoms include headache, loss of consciousness, cramps, paralysis, nausea, vomiting, epigastric pain, torpor and intestinal inflammation. Other symptoms include hypotension and intestinal and meningitic hemorrhagia (Belhkadar 1996a). However, Chenopodium may be included in small quantities in herbal mixtures for the treatment of fevers and headaches.

6.5.3 Cistus

Cistus (*Cistus salviifolus*), or *irguel* and the female plant *tirguelt* are widely used in El Maghzen (Appendix 2; plate 2.2). *Irguel* is administered for stomach, intestinal discomfort, menstruation, chills and rheumatism, for lack of appetite and to put on weight and is considered an aphrodisiac. The leaves are mixed with *taseft* roots (*Quercus ilex*) for stomach-ache and for warming. The crushed seeds mixed with water are taken for chills, menstruation, the seeds mixed with milk or soup for rheumatism. It is an important ingredient of *slilo*, a pleasant compact mixture of flour, honey, olive oil, mashed almonds and walnuts and powdered *irguel* seeds, consumed in winter or during celebrations such as weddings and Ramadan, served with tea as an appetiser. *Slilo* with *irguel* seeds has the reputation for helping women put on weight. For this reason, it is prescribed for lack of appetite.

6.5.4 Globularia

Globularia (*Globularia alypum*), or *tirka* in Tachelhit belongs to the Globulariaceae and grows in the mountains near the village (Appendix 2; plate 2.5). It forms bushes with blue flowers resembling globules. In El Maghzen, people refer to it as 'Berber tea' even though the leaves and flowers are mainly added to coffee and only to a lesser extent to tea. It is often mixed with other plants because it has a strong taste. Its main medicinal applications are for stomach-aches, headache, menstruation, diabetes and vomiting. It is also mentioned as part of a mixture to calm sexual excitability. It is used as a treatment for diabetes (Jarald et al. 2008a; Bnouham et al. 2002a), but has to be administered with care as it can be toxic, provoking vertigo, oliguria, diarrhoea, aching members, hypothermia and slow pulse rate. The essential oil contains protocatechic acid, mannitol, globularic acid, picroglobularine and globulariacitrine (Belhkadar 1996b).

6.5.5 Horehound

Horehound (*Marrubium vulgare*), or *ifzi* in Tachelhit belongs to the Lamiaceae. It is widespread around houses and according to Sijelmassi (1993a), is cultivated in areas above 1,200m. It is an emmenagogue, expectorant, febrifuge, sedative, and stomachic. Locally, people use it for diabetes in the form of tea, using the whole plant without the seeds. For stomach-ache and worms, the juice from the leaves is mixed with a little water and sugar. A mixture of leaf juice and olive oil is inserted in the ear canal for earache, and the powdered leaves with water and sugar for headache. A decoction is

often prescribed as anti-typhoid, anti-icteric, acting as a tonic and stimulant. Further external uses are for abscesses and boils where the plant is applied in poultices (Belhkadar 1996c). Use of the plant to treat diabetes is supported in the literature (Eddouks et al. 2002). Studies have shown that *Marrubium* produces marked beneficial effects on carbohydrate and lipid metabolisms when administered as an adjunct to patients with type 2 diabetes, reducing blood glucose levels (Herrara et al. 2004). It also produces essential oils that contain marrubiine, choline, saponosoids, and glucoside. It could be added as a dried herb to mixtures addressing blood sugar disorders.

6.5.6 Inula

Inula Montana or *ija oumghar* in Tachlehit, belongs to the Asteraceae, and is considered the queen of the warming herbs. It is found widespread in the mountains surrounding the village. Its main use is for colds, chills, and lung problems. The leaves are added to hot water, coffee or tea or mixed in hot milk. It can also be used for insomnia taken with hot milk. A further use is for aching eyes where the roots are left to stand in milk. *Ija oumghar* is a recommended addition in herbal mixtures to address cold and chilling conditions. People have warned against overuse because of the damage that it can cause to teeth, presumably for its warming effects.

6.5.7 Iris

Iris (Iris germanica), or *soussban* in Tachelhit, belongs to the Iridaceae (Appendix 2; plate 2.11). Irises are found in most walled terrace gardens, not only in El Maghzen but throughout the valley. They play a very important role in soil fixation because of their rhizome system. The plant possesses many therapeutic properties in traditional medicine, including anti-spasmodic, emmenagogue, stimulant, diuretic and aperient actions. Dropsy and gall bladder diseases can be relieved with a decoction of the root, and the juice of the rhizome is very effective for the removal of skin freckles and sores. Further uses include blood purifying virtues and as a sound treatment for venereal diseases. *Soussban* also produces an essential oil with important compounds such as flavonoids, isoflavonoides and their glycosides, benzoquinones, triterpenoids and stilbene glycosides. In particular, the iridals contained in the rhizomes have exhibited a potent pesticidal action and potent anti-cancer activities (Asghar et al. 2009; Rhaman et al. 2002). The use of *Iris germanica* is well known in the pharmaceutical and cosmetic industry and has already been granted a few patents for its anti-wrinkle properties and

transformation methods (Patent US 6, 224, 850 B1, 2001. Patent US 6, 459, 017 B1 2002). In El Maghzen and other villages, the roots of *soussban* are collected, cleaned and sold in the local souk. It can command up to a few hundred dirhams per kilo.

6.5.8 Lancer

Lancer is a mixture of 35 to 40 plants including some of the plants that have been described above (Appendix 2; plate 2.12). They are collected once a year, usually around mid-August, powdered in a mortar and pestle after drying. It is the women who undertake the harvesting and they claim that all plants found around the village are gathered at that particular time. People usually take it during Ramadan or when sick. The dosage is usually half a teaspoon either taken directly on the tongue and/or in honey or a liquid. To my knowledge, there is no written record of this mixture anywhere. According to my enquiries, no one outside the village seemed to know its origin nor the name. The taste is quite bitter which implies actions on the liver and digestive organs and on elimination processes. It is very likely however to exert other therapeutic properties. As there is no literature available on this mixture, its medicinal properties remain unknown. For the purpose of trying to unveil its therapeutic properties, a sample was analysed by the 'Laboratoire de Biotechnologies Végétales Appliquées aux Plantes Aromatiques et Médicinales'. Two hundred mg was soaked in 2ml of hexane (dry extract 2), 4ml of hexane (dry extract 1) or 8ml of hexane (dry extract 3). Hexane extraction lasted 12 h (overnight) to ensure equilibrium could be reached. The chromatographic analysis revealed the main compounds although certain molecules may have been lost or resulted from cosuppression or a lack of solubility. However, because of the presence of *Thymus satureoides*, *Lavandula dentata*, *Mentha pulegium* amongst other plants from the Lamiaceae family, the chromatographic analysis revealed a high content of camphor (23.03%), borneol (36.04%) and borneol acetate (40.93%). The herbal extract is therefore subject to further analysis and research.

6.5.9 Lemon Verbena

Lemon Verbena (*Lippia citriodora*) or *luisa* in Tachelhit belongs to the Verbenaceae. The genus contains approximately 200 species, shrubs and other small trees. Traditionally prepared in herbal tea, it enjoys a long history in folk medicine because of its antispasmodic, antipyretic, sedative and digestive properties. *Lippia citriodora* contains essential oils, from which geranial, neral and limonene are extracted and it is

believed that phenolic compounds (flavonoids) are responsible for the therapeutic properties (Argyropoulou et al. 2007). Further studies on *Lippia* essential oil have revealed antimicrobial activity (Pascual et al. 2001), activities primarily derived from leaf oil extraction. Although not an endemic plant of the High Atlas, it is found cultivated in profusion in gardens all around El Maghzen village. As its name suggests, it has a very strong lemon scent. Its main applications are for insomnia, headaches, and restlessness in babies, blood circulation and stomach-aches. The whole plant without roots is utilised in infusion or tea. Therefore, *luisa* could well be further cultivated and added to herbal mixtures to address insomnia, sleeplessness and agitation.

6.5.10 Madder

Madder (*Rubia peregrina*) belongs to the Rubiaceae. Its vernacular name in Tachelhit is *tarubiya*. *Tarubiya* is found mainly in stonewalls forming terraces and around gardens. In the village, the dried roots are used for circulatory and heart problems, and for childbirth. It gives food a red colour when used in *tajine*. Other uses of the plant include jaundice and liver ailments, and to fortify blood. The roots are further used as a diuretic and emmenagogue to induce menses. An essential oil can be extracted from the plant, rich mainly in anthraquinones. It is widely used in dying processes to obtain a red colour for leather or wool (Belhkadar 1996d). In a dried form, *Tarubiya* is an interesting addition to any mixture treating circulatory problems.

6.5.11 Spearmint and round-leaved mint

Spearmint (*Mentha pulegium*), or *fliyyo* and round leaved mint (*Mentha rotundifolia*), or *timijja* in Tachelhit (Appendix 2; plate 2.6), are mints belonging to the Labiatae family, and found widespread close to water or damp places. The plants are used in inhalation, thoracic cataplasms for lung infections and are considered the plants for winter ailments par excellence because of their warming qualities (Belhkadar 1996e). *Fliyyo* is further employed for delayed menses and for promoting menstruation (Potterton 1993). In El Maghzen, both plants' main use in the village are for colds, chills, coughs, stomach-aches and dyspepsia, and it is employed as the whole plant without roots in milk, tea or coffee. It is often part of a mixture with other plants in tea. Although the plants come from the same family, there are differences in the oils that the plants produce. *Fliyyo* produces an essential oil, which contains pulegone (85%), menthone, isomenthone, limonene, piperitone and neomenthal (Wren 1988). *Timijja* essential oil reveals phyto-

constituents such as piperitenone, piperitone and pulegone. Both plants are harvested in other regions of Morocco for essential oil distillation. *Fliyyo* and *timijja* are endemic to the Agoundis valley and found profusely by the river and in irrigated gardens. Both plants are a valuable addition to any dried herbal mixture prescribed for colds, coughs and chills, and when added to other plants for amenorrhoea or dysmenorrhoea.

6.5.12 Thuya

Thuya (*Tetraclinis articulata*), or *azouka* in Tachelhit, is endemic to North Africa. Thuya possesses many properties and is used in traditional medicine. Local people use it for headaches, often mixed with henna and applied to the head, stomach-aches, lack of appetite, bile problems, high blood pressure, vertigo, sickness, children's headaches, gynaecological problems, diabetes, fever, colds, chills and lung problems. The main method of preparation is to make a powder from the dried leaves, and then to add this to tea, coffee, sour milk or soup, or to inhale as a fumigant. A sticky resin named sandarac or *ar'ar* in Arabic or commonly referred to as gum *sandarac* is extracted from the bark, also known as gum Arabic or 'gomme sandaraque'. In the past, its prime application was in the production of varnish and as a useful added ingredient in lacquers, adhesives and paints. It was mainly exported to Europe for industrial and pharmaceutical purposes. Today, it has an application in dentistry and is used to fill decayed or damaged teeth. Potters produce another vegetable tar extracted from heating roots called *qatran* (Kaleta 2008). In the field, I noted how powdered leaves can be applied externally to heal wounds, and to close-up the wound of newborn babies' umbilical cord (Belhkadar 1996f). Kaleta (2008a) reports that women in Essouira region tend not to use thuya because of its warming, emmenagogue properties as it may cause an abortion in pregnant women. It has also the potential to be distilled as an essential oil.

6.6 Conclusion: the added value of essential oils

New drug discoveries derived from natural products or derivatives from these substances play a major role for the development of synthetic drugs and molecules. In the discovery and validation of new drugs, molecules from natural products will in future continue to play a preponderant role as active substances. Of approximately 420,000 species, less than 5% have gone through screening for one or several biological actions and the vast majority of antibacterials or 78% of new chemicals are derived from natural product molecules. With the advance in technology, phytochemical

analysis, especially the use of high performance liquid chromatography (HPLC), and spectrometry for the rapid characterisation of extracts and molecules, has had a major impact in research on natural products (Vuorela et al. 2004).

Distillation of essential oils is a very speculative market, because of the ratio between the high economic values of small quantities of oil in relation to the bulk of plant material (Bovill 1934). Prices can range from £130 to £150 a litre depending on the species and the quality of the oil that it produces. An added value, however, comes from the sale of small quantities, and prices may range from £4 for 10ml of *Thymus satureioides*, to £22 for 30 ml of *Chenopodium anthelminticum* (Laboratoire Combe d'Ase 2010). Essential oil is thus a lucrative activity with profit margins well beyond the prices paid to the harvesters at the beginning of the market chain (Chapter 5; Montanari 2004). France is at the forefront in the production of essential oils with a production of around 20,000 tons in 1999, an increase of 30% over the previous year. Countries that export essential oils into the EU include Bangladesh, Brazil, China, Egypt and Morocco. They can do this because of lower prices, better quality and because some of the plants do not grow in Europe (IAL consultants 2003).

The potentially useful natural resources of El Maghzen are abundant. Many of these are at present used mainly for local consumption only, but have the potential to be commercially developed on a small scale, to increase household revenues, on a cottage industry model. The analysis of thyme and lavender oils reveal that their phytochemical content is worthy of attention. The quality of the phytochemical content of thyme is as good as thyme essential oil commonly found on European markets for aromatherapy use. The high content of camphor in Lavender may be widely employed in ointment preparation, detergents as well as other sanitary products. Essential oil distillation is a slow, delicate and skilful process. It requires important technical skills that the local community still need to acquire in order to be able to produce high quality oil. While the aim of the distillation project was not to sell thyme and lavender essential oil on a big scale, it has the potential to be developed as a niche market product and to become part of local identity.

CHAPTER 7

Traditional Knowledge Distribution and its Potential for Erosion

7.1 Traditional ecological knowledge in El Maghzen

The acquisition of indigenous, traditional or local ecological knowledge (Berkes et al. 1995) is a complex dynamic learning process embedded within cultural forms and social institutions (Davis and Wagner 2003; Ellen and Harris 2000; Ellen 2011). In many places it is vital for the maintenance of the land, water and biological resources upon which people depend, and enters into decision-making chains at every stage in production, management, distribution and consumption (Grenier 1998; Berkes et al. 2000; Turner and Garibaldi 2004; Folkes 2004).

In El Maghzen, as in most other traditional societies, the transmission of knowledge is both *horizontal* between the members of the same generation, and *vertical* between members of different generations, stereotypically between parents and their offspring (Guglielmino et al. 1995). Both these horizontal and vertical transmission pathways contribute to the reproduction of traditional knowledge, which - though adaptable - is inherently conservative (Guglielmino et al. 1995a and Eyssartier et al. 2008). However, the inhabitants of El Maghzen are increasingly subjected to development discourse that challenges this knowledge. For example, when international donor agencies allocate funding for development projects, communities have to adjust their knowledge and behaviour in ways that justify these allocations (Blaser et al. 2004). New actors and new interactions within new social contexts all put pressure on existing knowledge practices (Guglielmino et al. 1995b; Zanette and Manrubia 2001). Another factor leading to change in traditional knowledge systems is the migration of the younger generation to urban areas such as Casablanca, Marrakech, Agadir and Rabat. This too contributes to knowledge vulnerability and ultimately to its erosion (Lozada et al. 2006; Voeks and Leony 2004). Given the specialized character of this knowledge and its potential continued utility for planners as well as for the local populations themselves, such externally-driven erosion is problematic, and a strong case can be made for recording it before it disappears entirely. In this chapter I examine the knowledge of subsistence practices in El Maghzen, in relation to food and medicinal

plants and their processing, and how this knowledge is distributed and acquired, particularly in relation to gender.

7.2 Agriculture and the edible non-field crop resources of El Maghzen

The communities of the Agoundis valley tend to rely heavily on local resources, and techniques for managing the land and other natural resources have little altered over the centuries. Gardens (*igran*), not only provide the basic crops to feed the family, but also a space for recreational and other social activity, and where, for example, women can make pre-arrangements for meetings. Every household has a more or less equal number of terraces which are the preferred places for gossip, often concerning *irgazen* (men) and *tamara* (marriage). In the summer, people will spend all day in the garden, and have food and tea brought to them by the children or by another member of the family.

Because children usually accompany their parents to the terraces and take part in the various activities there, these are important locations also for practical knowledge transmission. The garden is the place where the children absorb plant and other knowledge while weeding and preparing the terraces, or when gathering cow fodder or wood with their parents on the nearby mountains. Due to the restricted space for cultivation, the gardens are well-delineated, ploughed with a mule and wooden plough. Nothing is added to the land apart from cow and chicken manure once a year (Appendix 4). In the absence of chemical pesticides, crops are often companion-planted in groups of two or three cultigens, for example tomatoes with maize and peas. The architecture of the terraces is such that irrigated water can reach every garden. Water originating from villages higher up the valley is diverted from the river to irrigate the terraces of lower villages through an intricate branching system. In each village, the sluices are opened in turn at precise times of the week so that everyone gets a share. Men tend to undertake heavier and more complex structural tasks, such as maintaining the main elements of the irrigation system. As shortage of water is an issue during the summer months, maintenance of the waterworks is vital to ensure that the river flow can reach the lower terraces. The collection of wood is either a female or male activity, in which a group of young children team up for the task, loading the donkeys and mules with chopped wood before returning to the village at dusk. The main crops in the gardens are wheat and barley, harvested once a year during the summer, and more recently alfalfa (*Medicago sativa*), which is collected mainly for cow fodder.

In addition to the main field crops, there is a range of non-field edible resources, which are often exchanged and sold for cash, and which have potential for development.

7.2.1 Almonds and walnuts

Almonds (*Prunus amygdalus* var *dulcis*), *luz*, and walnuts (*Juglans regia*), *tarkayin* in Tachelhit, are abundant in El Maghzen (Appendix 2; plates 2.19 and 2.20). Walnut and almond trees usually belong to the same family, and are harvested in autumn. Family members, sometimes helped by outsiders, will gather together to break the almond and walnut shells (Appendix 7; plate 7.17), and the nuts are sold to the local *souk*, for about 60 dirham a kilogram. They represent an important source of income for families, particularly in times of hardship.

7.2.2 Barbary fig tree

The Barbary fig tree (*Opuntia megacantha*), or *aknaria* in Tachelhit, is very common around the village. It has its origins in the Canary Islands but is found throughout Morocco. In the village, the collection of the fruit (see Appendix 2; plate 2.7) with a wooden V-shaped stick (Appendix 7; plate 7.20a and b) is a very delicate process as the fruits are covered with prickles. Once these have been removed, the fruit can be consumed when ripe. They can be purchased in Marrakech, sold loose on carts pulled by donkeys or mules. The fig has medicinal value in the treatment of diarrhea although will produce the opposite effect when consumed excessively. The fruit can be confectioned into jam and the extracted oil, which fetches high prices, is much appreciated in beauty care.

7.2.3 Capers

Capers (*Capparis spinosa*), or *tylilout* are widespread around the village. The young flower buds are collected in early summer (see Appendix 2; plate 2.8), and packed into plastic bottles in a mixture of salt and water that is regularly drained and changed (Appendix 2; plate 2.21). They are then used for culinary purposes and make an pleasant addition to omelettes and *tajine*. They have beneficial properties and are particularly used as an anti-rheumatic. Other therapeutic actions include gout and sciatica, while the root bark is sold in herbal shops as a remedy for spleen problems

(Belhkadar 1996). Capers are eaten and well appreciated as a condiment throughout Europe.

7.2.4 Carob

Carob (*Cerotonia siliqua*), or *tikidit* (*tikida* for the pods), are already much exploited. They are collected in the village once a year, and sold at 25 dirham a kilogram to local middlemen, who transport the merchandise to bigger collection points from where they are then exported to Europe.

7.2.5 Figs

The common fig tree (*Ficus carica*), *ukzern* in Tachelhit, belongs to the Moraceae. Trees grow up to six metres, flower between June and September and the seeds ripen in August and September (Appendix 2; plate 2.9). The succulent fruits are actually not seeds or flowers at all, but a receptacle which encloses a multitude of flowers and seeds which never see the light but still ripen perfectly (Leyel 1980). It has great nutritional value, is highly calorific and is used as a laxative and expectorant. In El Maghzen, where fig trees are abundant, fruit is collected and left in the sun to dry (Appendix 2; plate 2.22) and consumed in a mixture of almonds and walnuts served with tea.

7.2.6 Olive oil

Olive oil in El Maghzen is produced from the species *Olea europea*. The vernacular name for olive is *zaytun*. Olive oil is produced in the village oil mill in the traditional manner, each family taking turns pressing the olives. The first operation involved in pressing the olives is conducted using a donkey. The donkey is led repeatedly around the mill to squash the olives in the millstone (Appendix 7; plate 7.24a). Thyme (*azoukni*), and lemon are then added for flavour. Once the first press has been finished, the broken olives are placed into baskets which are piled up together. In El Maghzen, a building has been constructed around a fallen carob tree being used as the press. The olive oil so produced is usually for personal use but can be sold on a small scale to tourists as a fine local product.

7.2.7 Pomegranate

Pomegranate (*Punica granatum*), or *taroumant*, belongs to the Puniceae. Trees are found in the village of El Maghzen and people consume the fruit (Appendix 2: plate 2.10). From an ethnobotanical perspective, it is the remedy par excellence for ulcers, gastro-intestinal ailments and diarrhoea (Belhkadar 1996a). Pomegranate juice has become very popular and consumed as a juice, is an important source of antioxidants and has major anti-atherosclerotic properties owing to its high content of polyphenols, including punicalagin, ellagitannin, and ellagic acid (EA) (Seeram et al. 2005). Further recent studies on pomegranate have revealed flavonoid-rich polyphenol fractions in the fruit extract which has produced anti-angiogenic, anti-proliferative, anti-invasive, anti-eicosanoid activities and pro-apoptotic actions in breast and prostate cancer cells *in vitro* and *in vivo* (Kawaii and Landsky 2004; Louis Jeune et al. 2005).

7.3 The distribution of plant knowledge in El Maghzen

Both women and men in El Maghzen share a common knowledge of plants. At the present time, transmission of plant knowledge and of other traditional subsistence activities is very fragile as the community is increasingly exposed to outside influences and interventions. These influences are likely to increase as road works improve access and when electricity is eventually installed in the village. The identification of transmission patterns is vital for gauging the likely success of the distillation project, and for assessing the potential for other development options utilising traditional knowledge. To undertake this analysis, I selected 35 females aged between 16 and 72 years old, and 35 male informants aged between 13 and 68 years old, all from El Maghzen, all active in medicinal plant and thyme collection, and from people I judged to be particularly knowledgeable in this area. The sample was taken across the age spectrum in order to obtain a picture of knowledge variation across the generations.

The transmission of plant knowledge through women is entirely within the community. Within families, parents are a strong vector and girls learn particularly from their mother (41%) (figure 7.1). Knowledge is also acquired from the grandparents (11%). To a great extent, girls learn by themselves (19%), either by watching other women preparing medicine in the house and when collecting medicinal plants in the garden, at the river or in the mountains. In practice, I suspect that a combination of these transmission pathways are involved, though the data shed an interesting light on people's own assumptions about how they acquire knowledge. Overall, this pattern

shows the importance of the family group. Other means of learning for women are through friends, from the elderly people of the village, and for older women from the herbalist (8%). Men's knowledge is acquired from their mother but to a lesser extent (26%) (figure 7.2). They also acquire knowledge from their grand-parents (6%). As with women, transmission occurs mainly within the family, defined as parents, sisters, paternal aunt and uncle and the transmission from these combined is greater than with women (38%). Many men claimed to learn by themselves (12%), but also from friends and acquaintances in the village (18%), and to a lesser extent from their fathers.

Men are more likely to have acquired their knowledge while harvesting on the mountainside compared with women (60% for men and 23% for women), while women are more likely to have acquired their knowledge in the home than men (42% for women and 12% for men). However, knowledge is also acquired in other contexts (35% for women and 28% for men), such as the gardens and at the river, although gardens are more important for women than for men. On the other hand, men claim to acquire more knowledge and skills in the setting of the river, and to a lesser extent in the gardens, than women, as they tend to concentrate their activities in these locations (figure 7.3). Some transmission occurs also in the village and this tends to affect women more than men. This is explained by the fact that women tend to spend more time in the village, despite visits to the mountains, river or garden.

Fig 7.1: Self-reporting of relative significance of particular social pathways for acquiring plant knowledge: women in El Maghzen

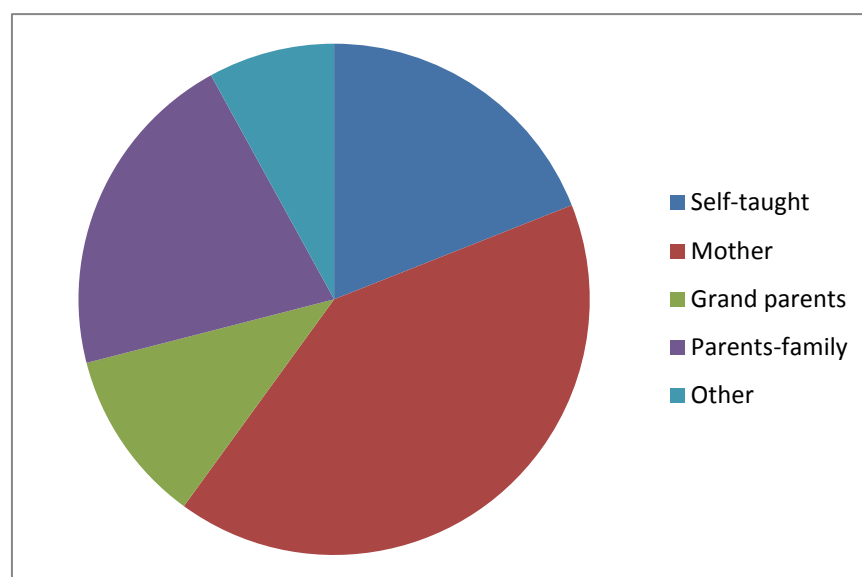


Fig 7.2: Self-reporting of relative significance of particular social pathways for acquiring plant knowledge: men in El Maghzen

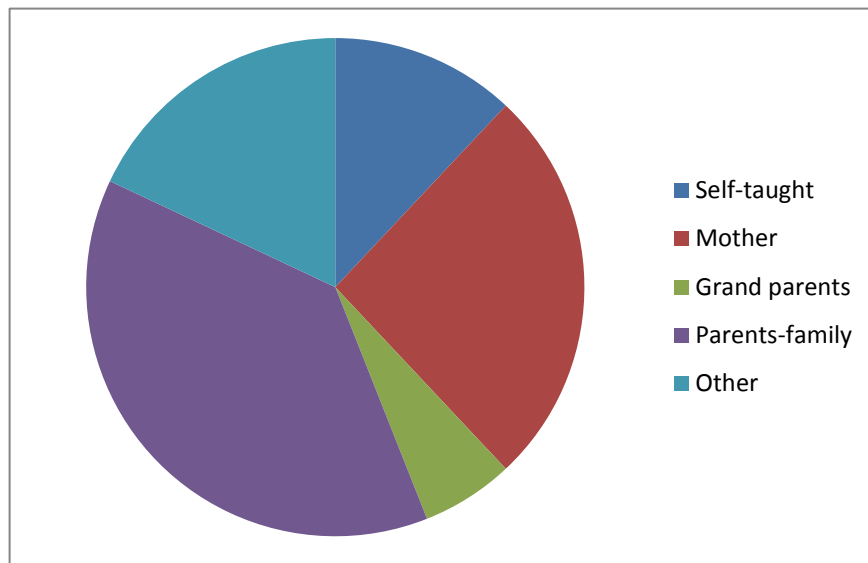
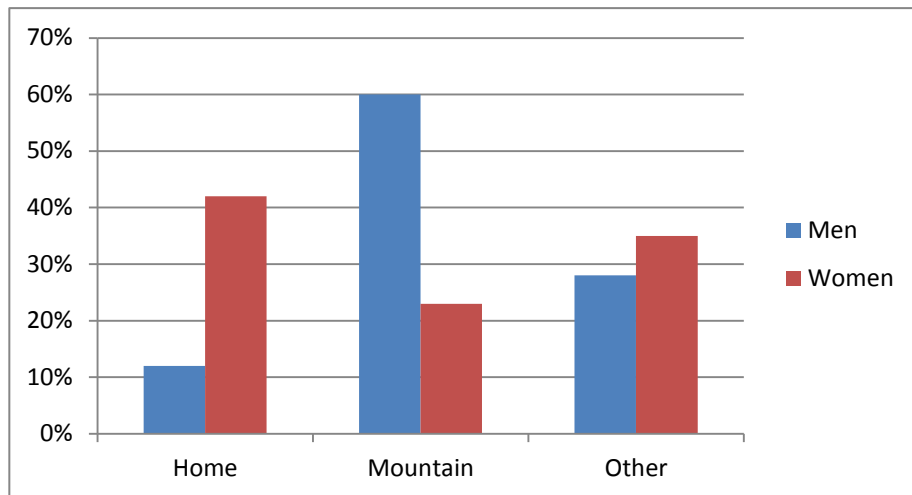


Fig 7.3: Response by men and women to the question 'Where did you learn about plants?'



7.4 Plant knowledge and gender

To measure the extent of shared plant knowledge in El Maghzen, I conducted a free listing analysis using Anthropac (Borgatti 1996). These data are important, not only in defining the character of available plant knowledge but also in understanding the mechanisms of transmission, and to monitor conservation impact. The results of the free listing analysis confirms the significance of this knowledge, and shows its embeddedness within the community. The sample used was based on interviews with most men and women in the village at the time of the survey. This covered a wide age spectrum of individuals involved (or with a history of involvement) in thyme collection and with herbal knowledge, but excluding minors. This allowed me to sample most households. I used a maximum of 60 female informants, which yielded a maximum average of 600 items with a frequency of 541. The most salient items were separated from the others at item 17 (table 7.1; see also Appendix 5). A second free listing exercise was conducted with 50 male informants yielding a maximum of 500 items with a total frequency of 300. The most salient items were separated from the others at item 13 (table 7.2). To check the frequency of items cited by both female and male informants, the two free lists were combined to provide a maximum of 100 informants and a maximum of 1000 items with a total frequency of 841. In this aggregate analysis, the frequency was cut at item 17 (table 7.3). Both frequency and average rank reflect cultural salience, which is indicated here by calculating Smith's S.

The plant knowledge of the people of El Maghzen is mainly related to species that are harvested for economic reasons, and to species that are used in the household for herbal medicine as well as for everyday use. Overall, plants that are harvested for economic purposes appear high on both women and men's free lists. Thus *azoukni* (*Thymus satureioides*) had a frequency of 56 (100%) for women and 33 (94%) for men, and is ranked high on the free lists of both women and men (tables 7.1 and 7.2). Both men and women harvest thyme for sale, which represents a valuable financial contribution to the household (Chapter 5: tables 5.5, 5.6, 5.7, 5.9 and 5.10) for two months during the summer season. Further, it is widely used in the household as a herbal medicine, particularly by women who favour it for treating stomach and intestinal discomfort, colds and menstrual pains, as it is readily available in the village. By comparison, *timzurria* (*Lavendula dentata*) has a frequency of 53 (95%) for women compared to a frequency of 28 (80%) for men. It is collected in small amounts for commercial purposes, but women use it mainly to prepare tea and coffee and, in

combination with other plants, it is added to traditional hair and henna mixtures. Most of the men's knowledge of *timzuria* relates to its collection and use in coffee. *Salmia* (*Salvia aucheri*), which is mainly collected for its commercial value, has a frequency of 27 (48%) in women's free lists compared to a frequency of 24 (69%) in men's free lists. The reason why it occurs so high on men's free lists is because men harvest it in large quantities at the same time as *azoukni* at higher altitudes, whereas women tend to concentrate most of their harvesting activities on the slopes directly surrounding the village. *Salvia officinalis*, on the other hand, was mentioned only by women, who collect it from the gardens, and had a frequency of 10 (18%). *Timija* (*Mentha rotundifolia*), ranks high on both female and male free lists (44 or 79% for women and 25 or 71% for men). It is important because both women and men spend a lot of time in garden activities, men in irrigation canal maintenance and women washing at the river where *timija* is mostly found, and in profusion. Its collection therefore occurs during these activities. *Azouka* (*Tetraclinis articulata*) ranks high on women's free lists (71%) compared to men's (46%). Although it is collected by both men and women for wood on a regular basis, it is mainly connected with women's activities, such as cooking, bread making and *hamman* (steam baths). Within the household, it is further used for fumigation and infusion, the leaves being recommended for headaches, colds and chills, stomach and intestinal pains, bile obstruction, high blood pressure, vertigo, nausea, and gynecological ailments. *Shich* (*Artemisia herba alba*) is mentioned with a frequency of 34 (61%), by women and 19 (54%) by men. It is not usually found around the village, and is not harvested. It can only be found at higher altitudes. People tend to use it when it has been brought back to the household when someone has been collecting wood or plants higher up the mountains or while visiting family in higher villages, or when bought at the local *souk*. *Mhrinza* (*Chenopodium ambrosoides*), collected by the river, is mentioned mainly by women, with a frequency of 27 (48%) and to a much lesser extent by men with a frequency of 4 (11%), as it is used extensively for children's ailments, such as fever, that are handled by women. *Ijomrar* (*Inula montana*), with a frequency of 24 for women (43%) and 12 for men (34%), is used for medicinal purposes in the household, and collected when people work at higher altitudes. It is a favourite remedy for colds and chills and women will administer it extensively during the winter season to both children and men. *Fliyyo* (*Mentha pulgemium*) was mentioned by 23 (41%) of women and 10 (29%) of men, and is found profusely by the river where it is collected by women while doing the hand washing. *Tirka* (*Globularia alypum*) has a frequency of

20 (36%) for women and 16 (46%) for men, and is used mainly in coffee, while *tilirin* is 19 (34%), was only mentioned by women, and is collected for medicinal purposes and administered for fever. *Irguel* (*Cistus laurifolius*) was mentioned by both women, with a frequency of 18 (32%) and for men 9 (26%). Everyone knows of *irguel* as an ingredient of *slilo*, a delicacy eaten at weddings or at other ceremonies, as well as during Ramadan, but also because it is consumed by women to gain weight. *Lerkamt* (*Mentha spicata*), the famous *nana*, was mentioned by 30% (with a frequency of 17) of women and 43% (with a frequency of 15) of men, and is known to everyone, being used in tea throughout Morocco. *Luisa* (*Lippia citriodora*), which was only mentioned by 15 women (27%), is cultivated in gardens and used extensively in the household as medicine, and is added to tea. *Tazouknit* (*Thymus pallidus*) was mentioned by 10 men (29%) and 9 women (16%), is found at higher altitudes on the mountains, is not collected for sale, and people are mostly aware of it because of its connection to *azoukni*, which they see as the female counterpart. *Shiba* (*Artemisia arborescens*), mentioned by 9 men (26%) and 10 women (18%) is also found in small quantities at higher altitudes, and is sometimes used in tea.

Table 7.1: Women's plant knowledge: results of free listing analysis

Latin name	Vernacular name	Number of reports	Reports as percentage of total number of respondents	Smith's salience
<i>Thymus satureioides</i>	Azoukni	56	100	0.951
<i>Lavandula dentata</i>	Timzuria	53	95	0.773
<i>Mentha rotundifolia</i>	Timija	44	79	0.495
<i>Tetraclinis articulata</i>	Azouka	40	71	0.436
<i>Artemisia herba alba</i>	Shich	34	61	0.312
<i>Chenopodium ambrosoides</i>	Mhrinza	27	48	0.167
<i>Salvia aucheri</i>	Salmia	27	48	0.211
<i>Inula montana</i>	Ijomrar	24	43	0.223
<i>Mentha pulgemium</i>	Fliyyo	23	41	0.155
<i>Globularia alypum</i>	Tirka	20	36	0.224
X	Tilirin	19	34	0.156
<i>Cistus laurifolius</i>	Irguel	18	32	0.150
<i>Mentha spicata</i>	Lerkamt	17	30	0.109
<i>Lippia citriodora</i>	Luisa	15	27	0.093
<i>Salvia officinalis</i>	Salmia	10	18	0.073
<i>Artemisia arborescens</i>	Shiba	10	18	0.070
<i>Thymus pallidus</i>	Tazouknit	9	16	0.065

X= Identification unavailable

Table 7.2: Men's plant knowledge: results of free listing analysis

Latin name	Vernacular name	Number of reports	Reports as percentage of total number of respondents	Smith's Salience
<i>Thymus satureioides</i>	Azoukni	33	94	0.941
<i>Lavandula dentata</i>	Timzurria	28	80	0.564
<i>Mentha rotundifolia</i>	Timija	25	71	0.344
<i>Salvia aucheri</i>	Salmia	24	69	0.423
<i>Artemisia herba alba</i>	Shich	19	54	0.336
<i>Tetraclinis articulata</i>	Azouka	16	46	0.257
<i>Globularia alypum</i>	Tirka	16	46	0.272
<i>Mentha spicata</i>	Lerkamt	15	43	0.153
<i>Inula montana</i>	Ijomrar	12	34	0.109
<i>Thymus pallidus</i>	Tazoukmit	10	29	0.239
<i>Mentha pulgemium</i>	Fliyyo	10	29	0.113
<i>Artemisia arborescens</i>	Shiba	9	26	0.084
<i>Cistus laurifolius</i>	Irguel	9	26	0.104

Table 7.3: Plant knowledge shared by women and men: results of free listing analysis

Latin name	Vernacular name	Number of reports	Reports as percentage of total number of respondents	Smith's Salience
<i>Thymus satureioides</i>	Azoukni	89	98	0.947
<i>Lavandula dentata</i>	Timzuria	81	89	0.693
<i>Mentha rotundifolia</i>	Timija	69	76	0.437
<i>Tetraclinis articulata</i>	Azouka	56	62	0.367
<i>Artemisia herba alba</i>	Shich	53	58	0.321
<i>Salvia aucheri</i>	Salmia	51	56	0.293
<i>Inula montana</i>	Ijomrar	36	40	0.179
<i>Globularia alypum</i>	Tirka	36	40	0.242
<i>Mentha pulgemium</i>	Fliyyo	33	36	0.139
<i>Mentha spicata</i>	Lerkamt	32	35	0.126
<i>Chenopodium ambrosoides</i>	Mhrinza	31	34	0.117
<i>Cistus laurifolius</i>	Irguel	27	30	0.133
X	Tilirin	22	24	0.105
<i>Lippia citriodora</i>	Luisa	20	22	0.072
<i>Thymus pallidus</i>	Tazoukmit	19	21	0.132
<i>Artemisia arborescens</i>	Shiba	19	21	0.075
<i>Salvia officinalis</i>	Salmia	16	18	0.081

X= Identification unavailable

7. 4.1 The importance of herbal medicine in the household

Herbal medicine is the only form of medical treatment available in the village. The identification of key collectors in the household in case of sickness are important factors because they give an indication of how time devoted to the distillation project might impact on the time spent collecting plant medicine, and how it might potentially erode this knowledge. Sixty four percent of women responded that they usually collected the plants themselves, whereas only 11% of men admitted to doing so. Age does not appear to be a factor influencing collection, either for women or for men. Eighteen percent of younger women and 26% of younger men interviewed indicated that, generally, their

mother undertook the collecting. Younger women in the village tend to collect together, such as when gardening or collecting animal fodder in the mountains. This is often independent of their mother. On the other hand, younger boys within the community are often requested to help in the garden, and may accompany their mother in the mountains when wood collecting or maintaining irrigation facilities along the river. These activities, therefore, also present opportunities for plant collection. Eleven percent of women and 55% of men indicated that other members of the family also collected plants for the household, such as brothers, sisters or aunts living in the same house. Men responded that their children or wives collected if they were sick, and that they would collect if their wives were sick. Friends from the village also collect if requested as indicated by 7% of women and 8% of men (figure 7.4).

Most families store plants in the house. Eighty-three percent of women and 63% of men responded that they always had harvested supplies of plants in the house. Twelve percent of women and 37% of men responded that they did not. Men's higher responses are attributed to the fact that plant preparation and administration is usually a women's occupation. Therefore, men may not always be aware that plants are available in the house. However, 5% of women mentioned that they did not always consume their own phyto-medicines, and that if allopathic medicine were available, would rather take that. Two women told me that they could not really consume plants because it upset their stomach (figure 7.5).

7.4.2 Intergenerational transmission

Transmission to younger generations is vital for the conservation of traditional plant knowledge in the village. It seemed relevant to find out how the villagers transmitted this knowledge to younger generations and where this occurred. Eighty-eight percent of the women indicated that they did pass on this knowledge to their children, and 12% indicated that they did not. For 75% of women and 29% of men, this was reported as occurring at home. Children were able to familiarise themselves with this knowledge during the preparation of herbal medicine for a sick family member in the house. Older members of the family (brothers, sisters, aunts or grandparents) equally participate in this transmission to younger children, or sisters and brothers. Sixty percent of men indicated that they showed plants to children and 40% reported that they did not. Six percent of women and 16% of men reported that they showed the children plants while in the mountains. Transmission to the children via women also occurred in other

settings (6%), such as by the river and in the garden. Other settings for female (6%) and male (15%) transmission were in and around the village. Thirteen percent of women and 40% of men indicated that they did not show the plants to younger children (figure 7.6). Overall, 88% of women estimated that children had some plant knowledge and 12% estimated that they did not. Sixty percent of men thought that the children knew about plants whereas 40% of men thought they did not (figure 7.7).

Fig 7.4: Responses by men and women to the question:
Who collects plants to be used as medicine?

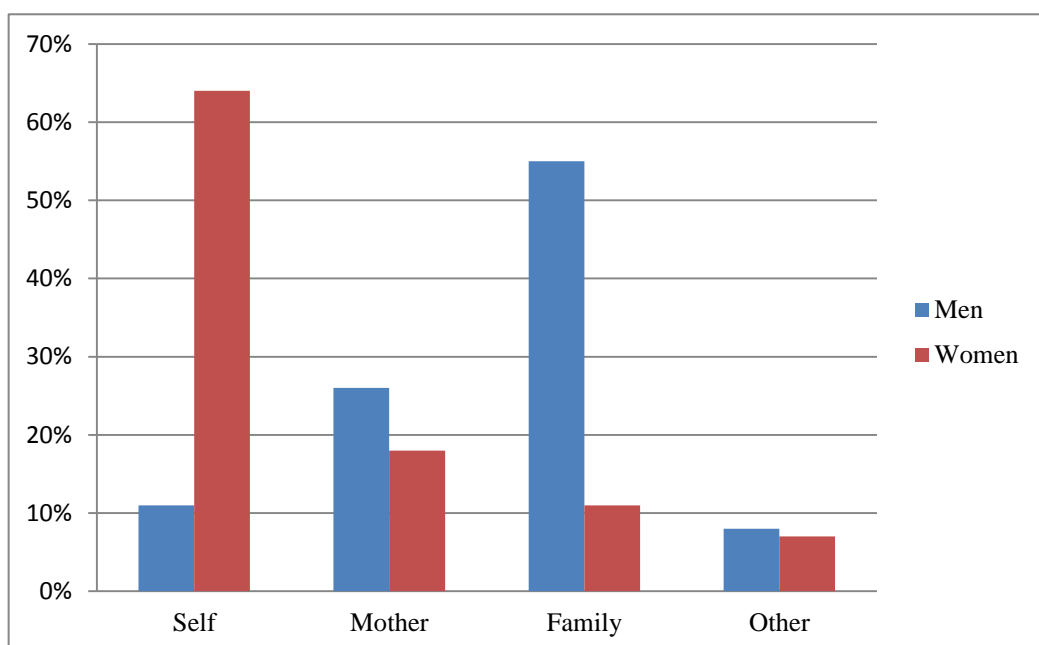


Fig 7.5: Responses by men and women to the question:
Do you have plants in the house?

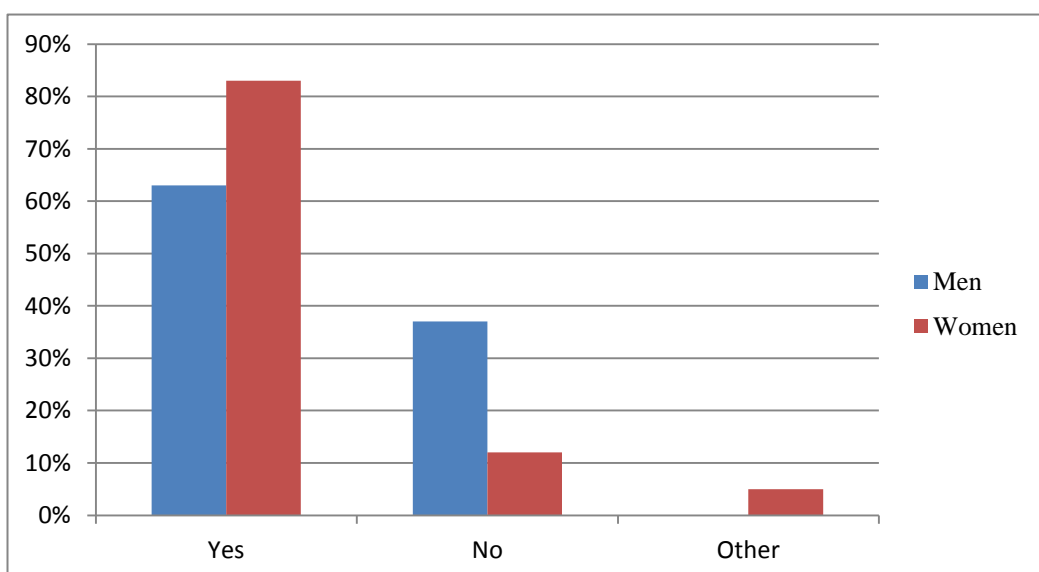


Fig 7.6: Responses by men and women to the question:
Where do you show the plants to younger children?

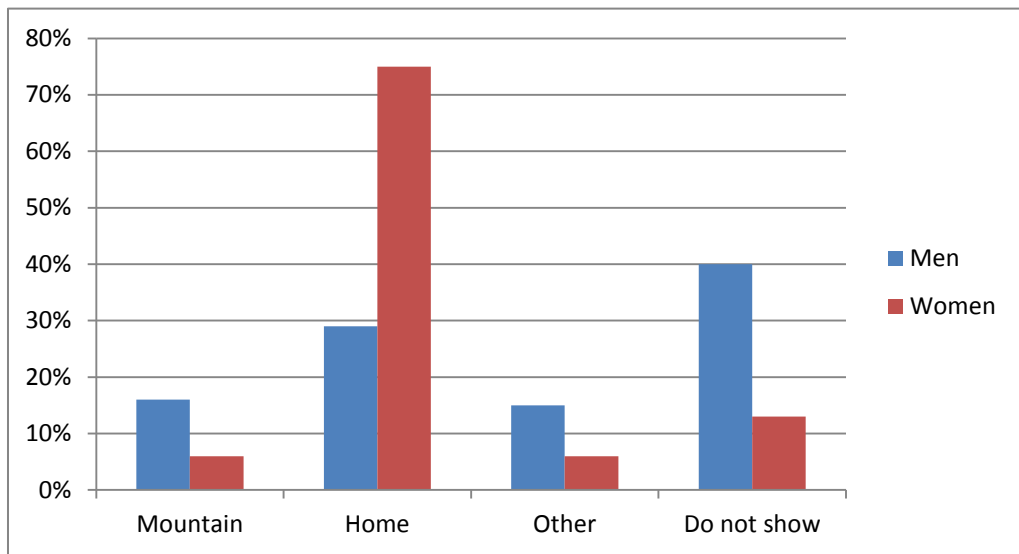
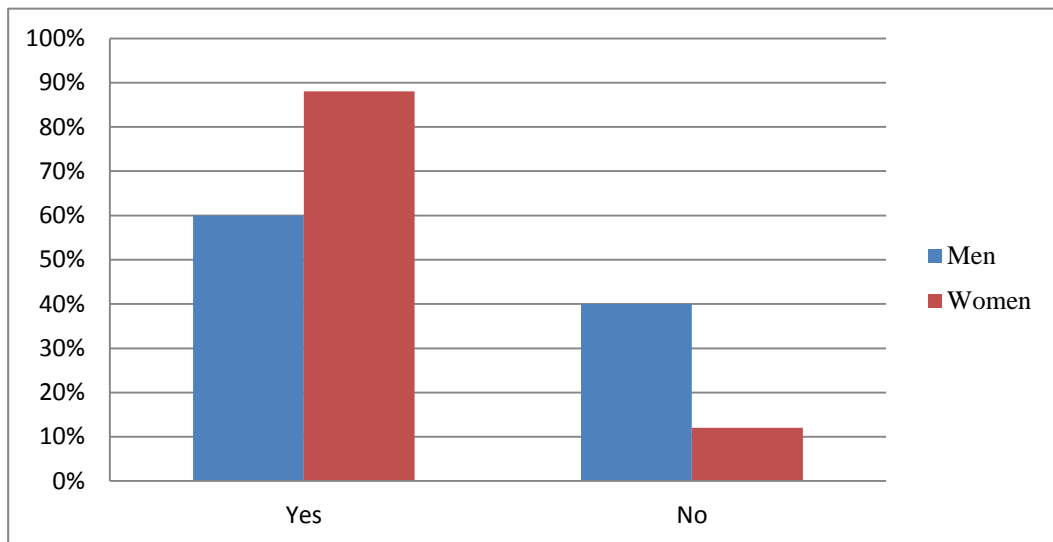


Fig 7.7: Responses by men and women to the question:
Do the children know about plants?



7.5 Other domains of traditional practice in El Maghzen

Besides plant knowledge, I identified a number of other traditional practices in El Magzhen which seemed to me to offer insights into knowledge distribution, transmission and erosion, some of which might have potential in the context of valley economic development. I identified nine indoor and seven outdoor female activities and 12 outdoor male activities. The main activities of both women and men are listed in table 7.4.

Table 7.4: Main traditional activities in El Maghzen for both men and women, other than plant collecting.

Indoor female activities	Outdoor female activities	Outdoor male activities	Mixed female and male activities
Baking bread (<i>arum</i>)	Animal feeding (shed)	Building work	Almond and walnut cracking
Baking bread (<i>tanourt</i>)	Cattle fodder collection (garden)	Building irrigation dam	Wheat and barley harvesting
Sorting medicinal plants	Cattle fodder collection (mountain)	Cultivation, preparing the land	Olive harvesting
Couscous making	Gardening	Fig collection	X
Grinding grain	Thyme harvest	Thyme harvest	X
Preparing grain for flour grinding	Washing at the river	Olive oil	X
Making bread oven	Wheat and barley collection (garden)	Wheat and barley processing	X
Preparing sour milk	X	Shaving sheep	X
Cooking and cleaning	X	Slaughtering animals	X
X	X	Bee keeping	X
X	X	Irrigation system maintenance	X
X	X	Wood collection and cutting	X
X	X	X	X

X= Activities are not applicable

Some of these skills could potentially be integrated into enterprise activities associated with the distillation project. Among women's activities, bread baking (both *arum* and *tanourt*) are valuable typical skills when accommodating tourists. Biscuits and homemade couscous can be sold on a small scale directly to tourists during their stay. Olive oil, the processing of which is associated with men, is an important local product that has the potential to be sold on a small scale to tourists as a typical regional product. Fig collection, also mainly a male activity, has the potential in terms of jam making, the use of leaf oil, and for other cosmetics, as has been the case in other parts of Morocco. These processes are usually undertaken by women. While it is not possible to quantify this knowledge easily, the monitoring of such activities is vital if we are to anticipate areas of possible knowledge erosion and find ways in which the activities might be adapted to a new context and thereby maintained within the community.

In order to gauge how erosion might most likely occur, I used recording techniques involving photographs. I conducted interviews with 35 female and 20 male respondents in El Maghzen selected to represent a range of ages and activities, and also on the basis of their likelihood of being involved in the distillation project. I asked each to rank the photographed activities in terms of local perceptions of difficulty and preference. I looked at indoor and outdoor activities for both sexes, and also at mixed gender activities.

7.6 Indoor female activities

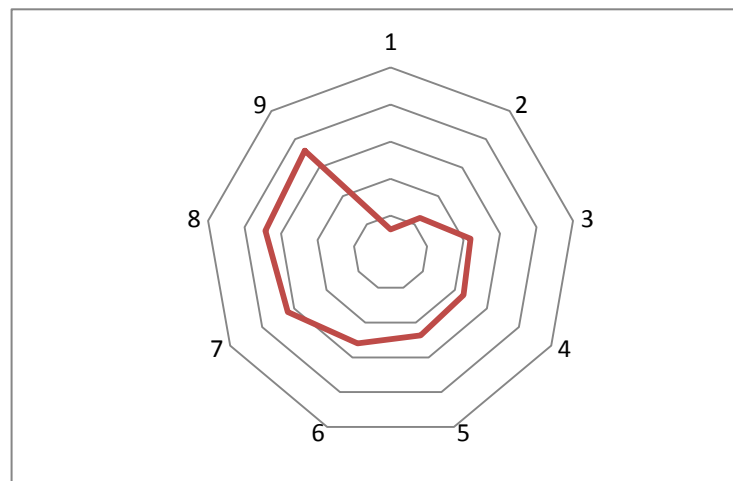
In the household, everyone and everything is very organised. Each person knows his or her duties, women in regard to gardening, cooking, and cow fodder collection, and men in regard to heavier duties. In the kitchen, *arum* and *tanourt* (Appendix 7, plate 7.3 a and b) two different types of wheat bread, are made daily in the traditional earthen bread oven. *Arum* is cooked on top of a metal plate while *tanourt* requires the dough to be packed into the inside circumference of the oven, until the heat bakes it into a crusty bread. Sour milk (*arou*) is made in a cylindrical apparatus, shaken backwards and forwards to separate the fat from the milk (plate 7.4). Couscous is usually made on Fridays, women gathering in the mosque prior to its making. Plain wheat flour is used with small amounts of water gradually added. The mixture is then rubbed in the palms of the hands in a circular manner in an open bowl until the mixture starts forming a clustered solid mass flour (plate 7.5a). This process is repeated several times until small grains are obtained. The mixture is then sieved to ensure that grain size is even (plate

7.5b). When it can be organised, women will gather together to bake biscuits (plates 7.6a and b). This activity takes place in rotation with both women and young girls taking turns. Maize is ground with a traditional mill (plate 7.7) that most houses keep in the basement, but if unavailable, women will borrow from someone else. This is an occasion for gossip and catching up on the news. The mill is inserted in the ground and is operated manually by a handle with maize, barley or oats poured into a side cavity so that it can feed the rotating movement.

Both indoor and outdoor female activities were ranked using Anthropac (Borgatti 1996), and the results are displayed here as radar diagrams. I sought to identify the preferred activities as well as identifying distribution patterns connected to age and kinship. Figure 7.8 indicates indoor activities ranked in order of preference. Grinding grain (1: plate 7.8; Appendix 7) is ranked lowest. The mill is usually situated in the dark basement of the house, away from the main area of social activity. It requires a lot of arm strength and is difficult for older women. Generally, younger women undertake this activity. In second lowest position comes oven making (2: plate 7.9). Although ovens are only made once a year, they involve a lot of work. Women have to find the clay, which involves digging and carrying it back to the house. The building of the oven is a messy activity, requiring a lot of skill and patience. The third lowest ranked activity amongst women is preparing the grain for grinding (3: plate 7.10). This activity strains the hands, and is disliked because of its association with grinding in the basement. The fourth lowest ranked activity is baking *tanourt* (4: plate 7.11). Baking *tanourt* is done daily, and requires skill and endurance since it is done while the oven is hot. However, this operation seems less onerous for most women because once the dough has been packed inside the oven, it only requires monitoring before removing the crusted loaf. Although this activity is performed by a single individual, it often takes place in the presence of other females, either other members of the household or visiting friends. The fifth lowest ranked activities are preparing and cooking food, and cleaning (5). Most women are not too bothered with these. They can be undertaken either alone or jointly, and in case of sickness or absence from the house, a family relation or friend may take over. The sixth lowest ranked activity is souring (6: plate 7.4). This activity is usually undertaken alone, often between two other activities, such as before going to the garden or between lunch and preparing the afternoon meal, or before going to feed the animals in the evening. Sour milk is not consumed on a daily basis or in large quantities, and does not therefore need to be made daily. Sorting medicinal plants (7: plate

7.12) is often done during leisure times, either individually or with other visiting women. Baking *arum* (8: plate 7.3a), another traditional home-made product which can be served to tourists during their stay within the village, also requires little work. Couscous making (9: plate 7.5a and b), another typical local product, is usually made on Fridays. It is often made collectively in someone's house or in the mosque, where women gather, and is an occasion to share stories and catch up on gossip over tea. It is significant that the most preferred activity is also that which involves greatest sociability.

Fig 7.8: Indoor female activities ranked in order of preference



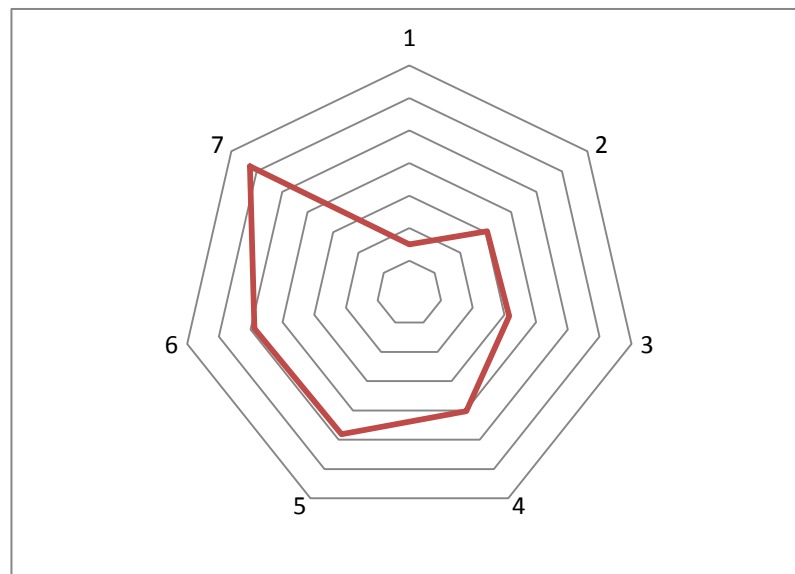
Activities are ranked in terms of difficulty and preference: moving outwards from the central point (least preferred) and across the web towards the edge of the diagram (most preferred). Key: 1= grinding grain, 2 = oven making, 3= preparing grain for grinding, 4= baking *tanourt*, 5 = food cooking and cleaning, 6 = preparing sour milk, 7 = sorting medicinal plants, 8 = baking *arum*, 9 = couscous making.

7.6.1 Outdoor female activities

Female outdoor activities reflect the harshness of daily existence. As shown in figure 7.9, collecting cattle fodder in the mountains (1: plate 7.13, Appendix 7) is the least liked activity. Although groups of between two and four women may collect together, it is hard work requiring traipsing long distances over the mountain slopes and carrying the fodder back to the village. Cattle fodder collection also occurs from the gardens (2: plate 7.14). Although not perceived as being so onerous because the gardens are closer to the village, it is still hard work that requires carrying bales of fodder on the back. Wheat and barley gathering (3: plate 7.15) comes next in terms of ranking. This activity

is performed during the summer and involves cutting the wheat and barley to be carried back to the village terraces for drying. Again, women will often gather and go down to the terrace together, and may reap either alone or with other family members. Washing at the river (4: plate 7.16) is undertaken collectively. Women will ask the younger adolescent children to take the washing down to the river. Once the washing is done, women will often ask young boys to take the washing back to the village on a mule. Women will pick a day in the week for this activity that is convenient to all. They usually spend half a day down at the river. It is an opportunity to gossip and catch up on the latest news. Thyme harvesting is ranked at 5 (figure 7.9) and (plates 3.1; 3.1(a), 3.2 and 3.2(a) in Appendix 3). Collected during the summer, women will gather either early in the morning or late in the afternoon after the heat has diminished. Harvesting is either undertaken in groups or alone, and here again, group cohesion is important. I have taken part in the thyme harvest with the women for whom it is associated with income, the distillation project and symbolises future opportunities. This may explain why it is not perceived as a onerous activity despite the hard work involved. Feeding animals (6), is undertaken within the village and is close to home. It usually takes place early in the morning or later in the afternoon. Last but not least, gardening (7: plate 7.1. Appendix 7; see also Appendix 4) is regarded as the most recreational and preferred activity. In the spring and summer, people will spend a considerable amount of time in the garden. Again, preference is highly correlated with sociability.

Fig 7.9: Outdoor female activities ranked in order of preference



See also note for figure 7.8. Key: 1 = collecting cattle fodder from mountain slopes, 2 = collecting cattle fodder from gardens, 3 = harvesting wheat and barley, 4 = washing clothes at the river, 5 = thyme harvesting 6 = animal feeding, 7 = gardening

7. 6.2 Mixed gender activities

Harvesting wheat and barley may be undertaken both by men and women. As described above, it involves bringing bales back to the village. It occurs in the summer season (May, June). By contrast, the olive harvest occurs in December and January. Often undertaken by women and men from the same lineage, it is an onerous activity mainly because of the cold conditions.

Cracking almonds and walnuts is the shared activity that people mind the least. This collective task is often a family event in which all members participate. Although it can be tedious because it requires sitting for many hours on the floor and cracking nuts on a stone (plates 7.17 and 7.18), it is nonetheless an occasion to converse about village or family matters over tea.

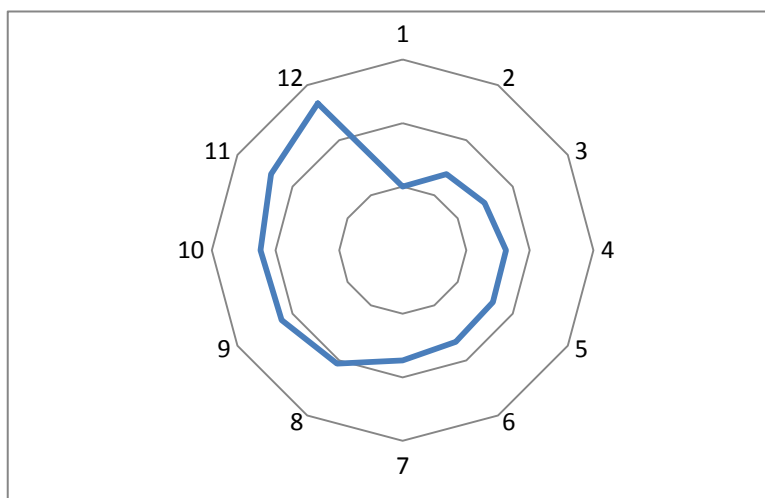
7.6.3 Outdoor male activities

Figure 7.10 ranks traditional male outdoor activities in order of preference. Building work (1: plates 7.19a and b) is ranked lowest. It is a skilful activity that most men can manage, and they will help whenever needed. However, the main building work is usually undertaken by the local village stonemason, a role inherited along family lines. Other men may be employed for the building work, especially when an official building

has to be constructed, in return for a small remuneration. Building is hard work, since it involves digging up stones from the mountainside, and shaping them according to what is required. What is more, building work usually takes place in hot summer temperatures. It is an activity that most young people do not want to get involved in. Fig collection (2: plate 7.20a and b) is mostly undertaken by men. It involves handling the prickly Barbary figs and is not always pleasant. Barbary figs are found throughout the village and are a potential commercial product. Most men find building river dams difficult (3: plate 7.21) as it involves lifting huge rocks from the river bed to facilitate terrace irrigation. In the summer when the river is dry, it involves digging the river bed to find water before diverting it to a common pool. With current fears regarding climate change, there are concerns not only in terms of irrigation but also of drinkable water for the village. While most women are involved in garden activities such as sowing, weeding and harvesting, it is men who have the duty of ploughing. This is performed with a donkey or a mule and traditional plough. It requires strength and endurance to control the animal and to ensure that the plough follows the right course through the soil (4: plate 7.22). Irrigation maintenance (5: plate 7.23) may involve some digging but overall is a relatively non-strenuous activity. Olive pressing at the mill is only undertaken by men (6: plate 7.24a and b). The pressed oil is natural, light golden and full flavoured. Olive pressing is also an occasion where men gather to exchange information. The wheat and barley processing done by men is quite different to that undertaken by women. Although men will also harvest wheat and barley from the terraces, they are more involved in threshing. The work is mainly undertaken using donkeys but does require control of the animal and a certain amount of strength to push the axle of the mill (7: plate 7.25). Shearing sheep is undertaken manually and is mostly done once a year. The shearing which is undertaken with a pair of hand shears, requires a lot of dexterity and strength to control the animal (8: plate 7.26). Not all men undertake shearing and certainly not the younger men from the village. Bee keeping is ranked higher than these other activities (9: plate 7.27). Again, it is a skilled process and not all men in the village are involved. Due to climate change, bee hives often have to be moved to other locations where there is more water. Men will collect wood in the mountains but this is more an activity for younger boys, who undertake it in groups and often with girls, using mules. This may take several hours and people usually take time over this activity. Further, it may be an occasion where 'informal' couples have a chance of spending a few hours together away from village eyes. The slaughtering of

animals is not regularly undertaken in the village and only a handful of men engage in this activity. A sheep may be slaughtered for celebrations such as for Aid El Kebir or for weddings and at other times, and shared between families. Usually one man kills the sheep and others may help in removing the skin and cutting-up the meat. As with women, harvesting thyme is the most preferred activity. Again, it represents income and is an opportunity connected to the distillation project.

Fig 7.10: Outdoor male activities ranked in order of preference



See also note to figure 7.8. Key: 1= building work, 2 = fig collecting; 3 = building river dams, 4 = cultivating the land, 5 = irrigation maintenance, 6 = olive oil processing, 7 = wheat and barley harvesting, 8 = shearing sheep, 9 = traditional bee keeping, 10 = wood collecting, 11= slaughtering animals, 12 = thyme harvesting.

7.7 Potential for knowledge erosion

My data suggest that the potential for knowledge erosion is related to work group composition and opportunities for sharing views on particular activities. Among women, much knowledge transmission occurs in the home, gardens, on the mountainsides and at the river. Group cohesion is very important in the community and many activities are collective. I analysed my data to identify a pattern of similarity of judgments related to preferred activities among informants. The results show that because many of the activities are collective, these could be subject to erosion through loss of group cohesion. On the other hand, opportunities for sociability associated with many preferred activities might seem to favour their retention.

Family or lineage may be connected to a particular group activity although age is also sometimes relevant. For instance, the pattern for the low-ranked indoor activities such as grinding grain is the same for women of a similar age. The age range may vary

between 32 and 59, regardless of kinship. On the other hand, there is a clear connection between age and kinship reflected, for instance, in a relationship between cousins of a similar age (17 and 19 years). Further, there are activities that are undertaken within the same family group but totally unrelated to age. This was the case where, a mother, daughter and close friend worked together. This was also seen in the case of cooperation between mothers and daughter-in-laws. There was no direct kinship connection between the daughters-in-laws, who may have come from a distant village inside or outside the valley. Other individuals of different ages tend either to mix partially, or stay outside the group altogether, either because there are no direct family ties or no pre-existing friendship link.

A similar picture applies to women's outdoor activities, such as going to the gardens or to the mountains. These are usually undertaken in groups. The pattern of distribution of preferences for a disliked activity such as collecting cattle fodder from the mountain may be related to age and kinship, in a similar manner to indoor activities. Women of a similar age, say between 32 and 42, may share a common view on a particular activity such as harvesting thyme, without there necessarily being a direct family connection. On the other hand, mothers and daughters may equally work together. Overall, the patterns show how similarity is encountered throughout the same family group or household, but also among quite separate households with no particular kinship tie.

Indoor activities that are undertaken jointly by women and men, such as cracking almonds and walnuts, and outdoor activities such as olive and wheat and barley harvesting, equally reflect the closeness of the group. For instance, an activity that is much disliked by some women is the harvesting of wheat and barley. This view was reflected in a group of women of a similar age range not necessarily related through kinship. The same pattern of distribution regarding a disliked outdoor activity, such as harvesting olives occurs also between those related through kinship or affinity, as between mother-in-laws and daughters-in-laws, and between young sisters-in-law living in the same household. On the other hand, a mixed indoor activity such as cracking almonds and walnuts may be disliked by women of a similar age but who are not related at all. The data for mixed activities show that although there is a pattern of distribution related to age, individuals are not necessarily connected by close kinship. On the other hand, the data also show that some women may share the same opinion regarding an

activity, regardless of age or kinship. What is preponderant overall is the closeness of the group.

Although some men may undertake some activities together, they tend on the whole to be less groupy than women. However, men of similar age but unconnected by kinship may share the same preferences regarding an outdoor activity such as building work, and this is found both in younger men in their twenties and among more mature men. Men working together may not be related directly by kinship but rather associate because they are of a similar age. This is usually the case amongst young men, when they are likely to influence each other. This is reflected in a disliked activity such as building work. On the other hand, older men tend to work individually and are less influenced by their colleagues. These may or may be not related through kinship. Therefore, the pattern of group cohesion is to some extent less pronounced for male as it is for females, and this regardless of kinship.

Similarly, men's preferences regarding mixed activities indicate a wide range of patterns. Men may present a pattern of preferences for an activity, such as harvesting wheat and barley, that is more-or-less connected to age but totally unrelated by kinship. However, men of very different ages and who are unrelated, may present a completely different pattern. Some preferences seem to reflect a family connection despite age, and some men may share a similar opinion, without being related through kinship. This is reflected in an activity such as olive harvesting. On the other hand, others may share a similar opinion regarding a disliked activity such as cracking almonds and walnuts, but who are connected only through distant family connection.

7.8 Conclusion

This chapter has demonstrated the importance of traditional practices in the village for economic well-being, how knowledge about them is distributed and how these practices are valued in terms of personal preferences. Such preferences seem likely to impact on the potential for erosion, depending on what new economic activities are introduced. Although it is difficult to predict how knowledge erosion is likely to occur, it is nonetheless possible to anticipate it. Because both male and female activities are more often than not undertaken in groups, we can say that as knowledge is passed through group members, members are more likely to influence each other and erosion is likely to occur through these channels. Women are generally very organised and although activities are undertaken individually, they rely on each other for assistance where

necessary. We might assume that as the distillation project develops in the village, and as women become increasingly preoccupied with this, and as they become more financially autonomous, so those subsistence activities that are least preferred will be those most likely to diminish, as long as their necessary outcomes can be covered in other ways, such as through trade or exchange. With the decrease in an activity, transmission of knowledge associated with it is likely to erode. Currently, there are mechanisms that mitigate erosion. For example, where female family numbers are low, a newly-wed entering the household may allow for the continuation of a particular activity. Although transmission of knowledge is not guaranteed through this mechanism, an in-marrying woman might also bring with her knowledge that is not already available in the household. Further erosion of female knowledge is likely to be aggravated if a family member moves away (for example, a daughter marrying and leaving the village). Although men do not generally possess as much traditional plant knowledge as women, erosion is a higher risk for them as (particularly younger) men are more mobile, more likely to move away and more likely to engage in off-farm non-traditional forms of labour.

CHAPTER 8

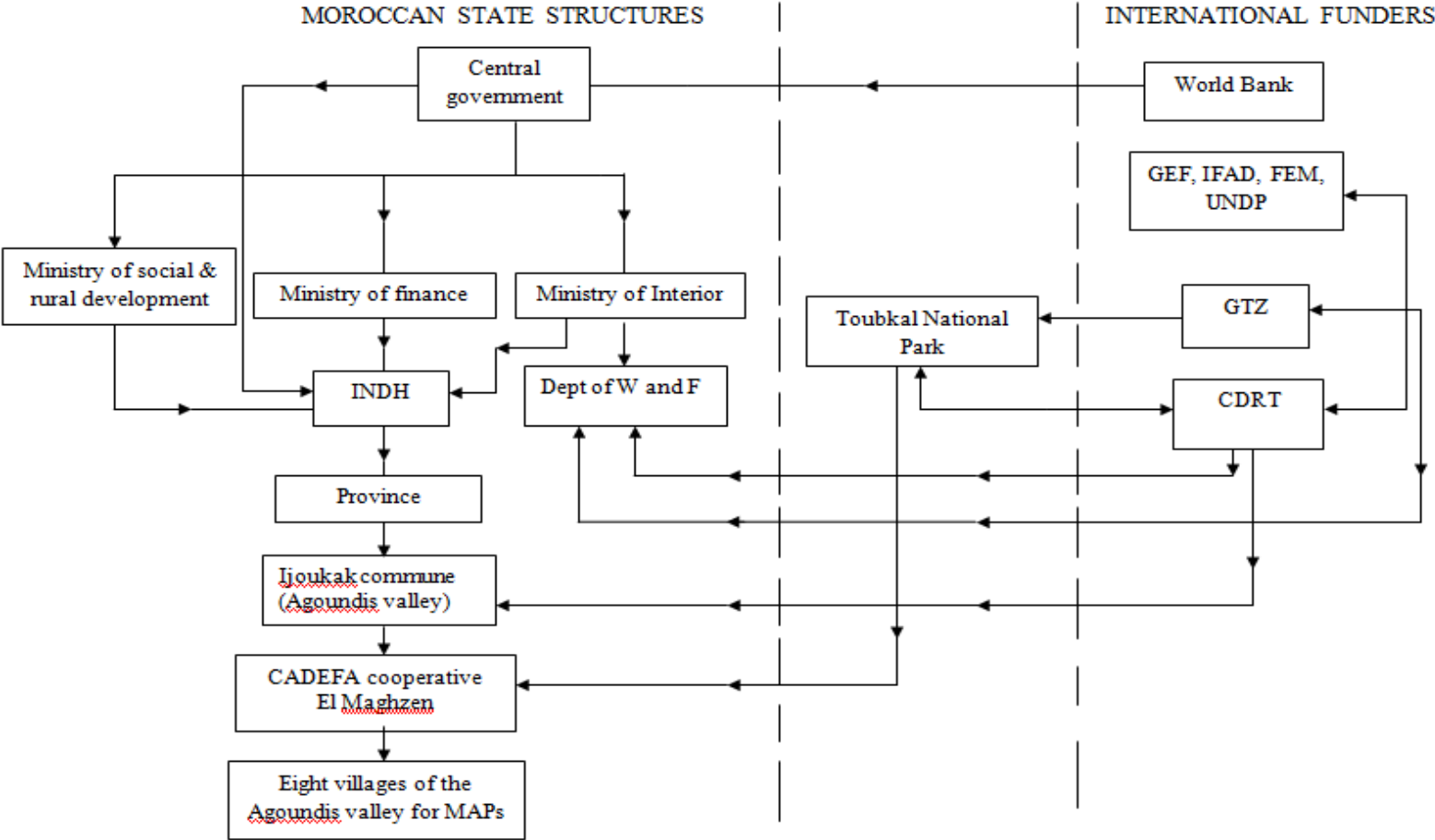
The Agoundis Valley Distillation Project:

A Top-down Perspective

8.1 Introduction

The present chapter examines the implementation of the distillation project in El Maghzen from a top down perspective. I will describe (a) the international funding agencies and the services that they provided, including attributed budgets (b) the role of the institutional partners; (c) the role of the facilitating NGO and the reasons for internal conflict emerging between the institutional partners; (d) the way power is acquired, exercised and intricately intertwined with local politics; and (e) the obstacles that have prevented implementation of the project so far. I am particularly concerned to demonstrate how a specific local project is connected through a web of bureaucracy and political decision-making to the involvement of numerous organisations at the highest international and national level (fig 8.1).

Figure 8.2: Organization chart showing connections between the institutions involved in the Agoundis valley distillation project. Arrows indicate flow of funding decisions and influence.



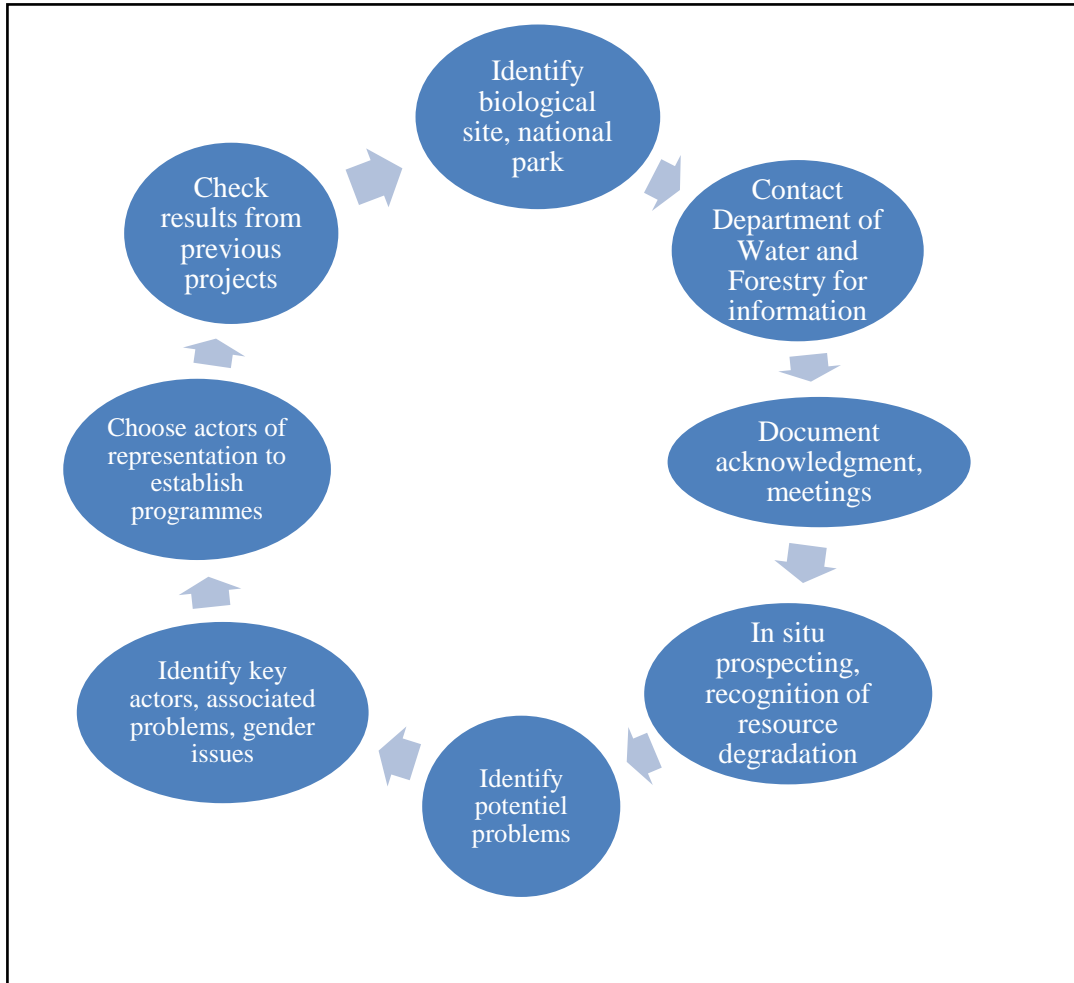
8.2 The Moroccan national development plan and international aid

Morocco has become the gateway to Africa. King Mohamed VI, in power since 1999, has opted to open up the country as a strategy for development and political stability. In order to achieve this, cooperation with external funding agencies is a prerequisite, for whom the conditions of compliance are poverty eradication, good governance and decentralisation. The country has benefited from major international funding initiatives over the last two decades, one of the most recent being US\$ 200 million through Country Partnership Strategy (CPS) for the period 2010-2013. The aim of this initiative is to set in place new World Bank priorities such as enhancement of growth, competitiveness and employment; improvements in service delivery to citizens, and sustainability in the context of a changing environment. Good governance, and now climate change, has become high on the political agenda (World Bank 2010), while the UNDP with its international expertise is involved in analysis and problem-solving. The UNDP also plays a role in coordinating numerous national and international partners in order to address the Millennium Development Goals (MDG). The three main elements of the MDG are poverty reduction, environment and energy, governance and human development (UNDP Morocco 2010). With a budget of US\$ 8.320 million for a period of two years (2007-2009), the UNDP has adopted the Art Gold programme (Appui aux Réseaux Territoriaux et Thématiques de Développement Humain) whose main concern is with local governance. This programme was initiated in 2004 in close association with UNESCO, WHO, UNIFEM and UNOPS. The initiative aims to promote a new multilateral dimension within the United Nations, and within governments, to privilege active participation of local communities and social actors between North and South in the Millennium Development Goals context. The International Fund for Agricultural Development (IFAD), a specialised agency of the United Nations created in 1977 claims to be the only international financial institution dedicated exclusively to poverty reduction and food insecurity in the rural areas of developing countries. Its strategic objective for 2007-2010 has been to improve its effectiveness in development. Although all these programmes converge towards the same goals, the Global Environment Facility (GEF), a financial mechanism for both the UN Convention on Biological Diversity and the UN Framework Convention on Climate Change, specifically addresses the biodiversity and climate change agendas. Further economic assistance has come from the EU, with a recent €86 million to develop the health sector, and \$132 million for urban waste management. The African Bank of Development (ABD)

contributes to the national education development programmes with two loans amounting to €75 million, and an extra €240 million towards an airport, a total envelope of €317 million. In addition, a memorandum of understanding has been signed by Morocco and the Fonds Saoudien pour le développement (FSD) to support the INDH plan with an allocated budget of \$50 million (Maghreb-info 2009).

Since we are primarily concerned here with natural resources, it is appropriate to focus on the mechanism for allocating GEF funding. Typically, this follows a pattern (figure 8.2) whereby the intervention zone has to be near a site of biodiversity interest or a national park. The amount allocated is determined according to a set list and guidelines have to be carefully followed in order to increase the chance of being granted financial support from the programme (Appendix 8). In this context, the High Commissioner of Water and Forestry and Fight against Desertification (HCEFLCD) with its national branches, is the first point of contact for obtaining the required information regarding endangered species in the intervention zone. Following meetings and field trips to identify and assess threatened species and potential problems, forms have to be completed with the relevant information. Once this is done, the most important stakeholders in the intervention zone can be identified, taking particular account of gender issue. A representative body engaging with these actors must be identified in order to arrange meetings with the local stakeholders. In February 2003, a memorandum of understanding was signed between the UNDP/ GEF/ PMF and the CDRT to act as this representative body.

Figure 8.2: Standard model for UNDP/GEF funding application process
Source: CDRT Marrakech 2005.



8.3 The INDH and the province of Al Haouz

In 2005, the Moroccan government launched the Moroccan National Initiative for Human Development (INDH) in response to the demands for institutional reforms, linking political actors, syndicates and economics, civil society, family and citizenship, and to encourage decentralisation at the regional, provincial and communal level as stipulated in the Art Gold programme. INDH aimed to address the issue of economic development, particularly in relation to the most deprived sectors of Moroccan society, through the promotion and expansion of associations, women’s rights, the position of children and social exclusion agendas (INDH 2006). To be able to fulfil these goals, the King approached the World Bank in 2006 whose board of directors approved the allocation of a US\$100 million loan (World Bank 2006).

At the regional level, the province of Al Haouz had by the end of 2005 become involved in the process of administrative decentralisation. The regular protocol for approving a potential project involves the identification of community problems and

priorities, and in this the commune holds a major role. Typically, a commune would gather in an assembly composed of the commune's committee, a group of the local decentralised services (Education, Healthcare, Department of Water and Forestry), and the members of a local village association and representatives of the INDH in order to identify the problems in situ. Once this has been done, INDH officers make the decisions at the province level that releases the transfer of money to the rural commune or even to a local association if thought fit to receive funding. In the case of the Agoundis distillation project, a sum of 70 000 dirham was allocated to the commune of Ijoukak. Accountability up to this point was quite transparent, as the province must in turn report allocated budgets to the Regional Court of Audits. Although the money was considerably delayed, either due to administrative inertia or withheld for undisclosed reasons, it finally reached the commune in 2006.

Poverty alleviation and gender issues are high priorities on the political agenda. Budgets have to be attributed and a well intentioned governor visiting parts of his province for project opening ceremonies or to visit the site of some natural disaster will use the opportunity to identify projects that would be appropriate recipients for particular categories of aid income. Following a couple of meetings with the governor of Al Haouz, I was asked by the governor to assist in bringing a group of women from El Maghzen to the province office to voice their interest concerning a particular project. By doing so, the governor had bypassed both the local commune's level and also the local Ministry of Interior authorities of the *caid* and *khalifa*. The women were excited but apprehensive as to the local reaction, as they would normally expect to seek local permission before making such a representation. By going directly to the provincial office, within the span of a two hour meeting, a project had been drawn-up, consultation had been achieved and an application form issued; an embarrassment for the women given their numeracy and illiteracy.

8.4 The rural commune of Ijoukak

In his new concept of authority, the king has put much emphasis on the role that leaders of regions, provinces and communes should play in protecting public services, local businesses, individual and collective freedoms, local security and stability, local level management and the maintenance of social peace. The new concept of authority is supposed to bypass administrative offices and to promote direct contact and local problem-solving using appropriate solutions (El Yaacoubi and Harsi 2006:191-192).

The new concept of authority amounts to a new culture of public service based on respect for decentralized institutions and local liberties. It implies increased administrative and financial autonomy for local authorities (Bergh 2009:8). However, in order to avoid corruption, the province approves the annual budget allocated to the commune and the *caid* overviews the meetings to ensure that realistic proposals are made (Venema and Mguild 2002). This reshuffling of power relations at the commune level as stipulated by the king's wishes has become crucial not only in identifying community's vital priorities but also in taking action. The commune is in a better position to identify these priorities since it is closer to the people. This is only feasible providing that there is a good understanding of the issues at stake, but especially the will to act upon them. The task of finding a leader, who can act, transparently, in the common good is indeed difficult. This is a society managed by a handful of local elected people motivated by self-interest and influenced largely by traditional local elite who have the financial means to promote clientelism.

Unlike his predecessor, the current president of Ijoukak commune was trained as a plumber and was primarily interested in finding means to make money. The commune is the last link in the political hierarchy and obeys orders that come from above. He was therefore quite willing to follow the top down directives and to act upon them. However, he not only lacked the technical skills but also the drive and motivation to address these issues. The commune allocated the INDH received budget of 70 000 dirham towards the construction of the distillation unit. However, commune's officials soon claimed an interest and imposed a tax on the Cooperative. The lump sum of 2000 dirham had to be paid well before construction of the building even started. The introduction of a new incentive in 2008 required harvesters to pay insurance in order to get access to the mountains for harvesting. The President of the cooperative had the task of collecting the money from the villagers. This was not popular. According to one informant: 'The Cooperative is supposed to help us, and not to financially drain us. We simply do not have this kind of money to pay for insurance, even though when we start working, everyone is quite willing to make installed payments with whatever he/she can afford'. To add to the turmoil, the President of the Cooperative had taken to signing-off papers on behalf of the President of the commune, making the most of his status. The president obviously did not understand what he was signing as these papers were in French. His signature served to conceal funding transactions allocated to various small projects that did not occur. In 2008, the contracting companies signed the papers to

undertake the installation of electricity from Ijoukak to El Maghzen. However, the work was never done and the money simply vanished. Although there is accountability at the Province level, lack of transparency and local accountability at the commune level and the corruption it can disguise are major problems. In the 2009 communal election, the president was not re-elected and eventually found employment as a lorry driver on a building site in Marrakech.

8.5 The local authorities

The local authorities represented by the *caid* and *khalifa* are in close contact with the rural commune of Ijoukak. For the distillation project, they claimed to be acting as supporting agents, facilitators and mediators. Both the *caid* and the *khalifa* agreed that the project was a good initiative for the region. The former's view was that one should not expect more than the population's educational capacity and the latter maintained that the people had to conform to the local authorities' view. As the official representatives of the Ministry of Interior, the *khalifa* and the *caid* are both significant authority figures, embodying the king's emphasis on local security and stability. For example, they can act as mediators in village conflicts and in the interests of local and national security, and given that poverty is a recruitment ground for terrorism, they are informed of who enters or leaves the valley. The local *moqqadem* (reporter) who also has the function of postman regularly reports the movement of people or other developments in the valley. By assigning to the commune the role of the first level connection with the local population, the authorities are supposedly able to identify problems and define potential projects. Consequently, the local population has to bypass the commune and the local authorities, should they want to initiate a project of their own or hold a meeting. The development of any independent bottom-up initiative is therefore jeopardised from the start, as its success is dependent on the permission, good will, honesty and understanding not only of the President of the Commune but especially the local authorities. This was, for example, the case with respect to potential initiatives from women in the context of the distillation project.

8.6 The role of the CDRT (Centre de Development de la Region du Tensift) in initiating the distillation project

Though some figures within the Department of Water and Forestry claimed to be solely responsible for the development of the distillation project, the CDRT had in fact been instrumental in its realization. This NGO, based in Marrakech, has 150 staff (researchers, engineers, doctors, entrepreneurs and administrators) and two major objectives. The first is the organisation, animation and framework provision in relation to all development work in the Al Haouz region. The second is the undertaking of demonstration pilot projects. For the distillation project, it worked in partnership with the World Bank, GEF, UNDP, GTZ, DPA (Direction Départementale de l'Agriculture), INDH, and the Department of Water and Forestry. Typically, and in accordance with its internal policies, CDRT engaged the local population in development incentives through participatory approaches. The objective was the creation of a structure in which local people could be actively involved and in control at every stage from harvesting the plants to export of the products. It sought to establish a structure that above all would allow local people to have a major part in the decision making process, and would combat existing inequalities in the thyme trade of the valley.

The distillation project began in a small way, as the: 'Projet de valorisation des plantes aromatiques et médicinales dans la vallée d'Agoundis (Commune d'Ijoukak, Province d'Al Haouz). The original project was designed to support a small group of village associations around the Toubkal National Park, in collaboration with GTZ and the park administration. When CDRT started working in the valley in 2003-2004, no one showed particular interest, either in the project or in the aromatic and medicinal plants of the valley. CDRT wanted to engage with the local population and to raise awareness and ensure involvement. One way to achieve this was to arrange for villagers to visit other mature conservation projects. A group of villagers visited several sites, including the National Centre of Hydrobiology and Fish Farming in Azrou, a trout farming project in the village of Taourirt in the adjacent Unaine valley. Aromatic plants being the main interest, the group also visited a botanical garden and a herbal products production unit in the Ourika valley, and an argan oil (*Argania spinosa*) extraction cooperative in Essouira, The CDRT also provided a small distillation demonstration for the inhabitants of El Maghzen and other villages. This experience encouraged the village association to suggest renovating an old storage building to install a distillation unit, the alembic. In order to find funding, it was necessary to attract more local support.

To this end, the CDRT requested aid from the Department of Agriculture, and from the Department of Water and Forestry for technical and administrative services, and gained support from the ‘Direction Départementale de l’Agriculture’ (DPA) through an IFAD programme: ‘Développement rural des zones de montagne d’Al Haouz’. However, the IFAD role in the project had not been defined at that particular point in time. GTZ, however, through its involvement in the Toubkal National Park, was included in the project. The alembic was ordered by the CDRT, designed by a technician and manufactured by a company in El Jadida for 10 000 dirham. It required authorisation from the Moroccan Customs and Excise Office before manufacture. A project pilot committee, including the commune of Ijoukak and its previous president, was set up in the valley in 2004.

The Department of Water and Forestry’s role was to provide trees, technical assistance in planting, maintenance and training for sustainable extraction, as well as scientific follow-up on the growth of the species planted. The commune had agreed to give up rights of usage to the local population. The agreement was that the local population could extract the resources from an area to be determined by the Department of Water and Forestry without having to pay the commune. The local associations therefore had all rights of usage providing that they respected the delimited areas. The valley committee would arrange assistance and management. On the other hand, the village associations were expected to plant, care and manage the trees and shrubs, and to respect management directives agreed by the valley committee. This included respecting designated areas, refraining from construction or use, other than in the authorized plantations, and using the resources only for personal and non-commercial purposes. Last but not least, the village association would need Department of Water and Forestry authorisation prior to any extraction. Clearly, CDRT had tried to accommodate all parties and anticipate various implications. It endeavoured to establish an internal regulatory body for the management of local resources where penalties would have to be paid to the village association when rules were infringed, a practice resembling the traditional *jama’a*.²⁰

²⁰ In the traditional *jama’a*, one is penalised if caught using resources in an indiscriminate manner.

The project gained increasing public attention, particularly with the visit of the Governor and the High Commissioner of the Ministry of Interior for an opening ceremony in 2007. The Department of Water and Forestry, who had been originally involved only to provide technical services, became increasingly interested when they realised that resources other than trees, wood and (ligneous shrubs) would be extracted. The Province, through the new INDH initiative (2005) and available budgets, suggested the construction of a bigger building. The concept of a Cooperative emerged at a later stage when CDRT realised that some local people did not have a voice, particularly if they did not belong to a village lineage. CDRT, whose mission was to involve everyone in thyme harvesting, conducted basic workshops locally to try to work out how even the most marginalised people could be represented. A cooperative was thought to provide the best solution. The overall vision was to integrate all village actors, to create an authentic local development advantage by adding value and improving the socio-economic conditions, a measure that would impact on existing local labour exploitation and prevent the loss of profits to outsiders. The NGO took great care in reviewing articles from other cooperative models normally run privately or by professionals. The Agoundis valley cooperative had to be anchored firmly in the village, and if successful, would serve as a model for others. The cooperative articles of association were carefully elaborated so as to provide rights to extract not only medicinal plant resources of the valley but all other resources vested in agriculture, forestry, and fish farming. The articles also gave the cooperative the right to negotiate directly with the Department of Water and Forestry to obtain access to resources. They further empowered the community to request assistance should this be required. Most importantly, they provided the capacity to negotiate and sell thyme directly, a new development that would unbalance existing arrangements. Once the project was running, CDRT would withdraw but continue to provide technical support if requested.

The Cooperative, named CADEFA (Coopérative Agoundis de Développement de l'Environnement Forestier et Agricole), was created in 2006. Twelve office members and six scrutinisers were chosen to represent and manage cooperative affairs for the eight villages. However, before the cooperative could operate, it required reports from both the Department of Agriculture and the Department of Water and Forestry confirming that all arrangements were satisfactory. The 'Bureau de l'environnement social' in Marrakech is responsible for endorsing such reports which would then be transmitted to the 'Office du développement et de la coopération (ODECO) in Rabat in

order to obtain authorization to operate. While the Department of Agriculture provided a good report, the Department of Water and Forestry blocked the process saying that in order to deliver a report they needed to check the building work.

8.7 The role of the Department of Water and Forestry

The mission of the Department of Water and Forestry is to develop and implement government policies in the areas of conservation and development of sustainable forest resources, sylvo-pastoral lands, parks and nature reserves subject to the forestry law, as recognised by the *Dahir* (decree) of 1917. The Toubkal National Park is officially recognised as a site of high biodiversity and is therefore under the '*tutelle*' of the Department of Water and Forestry. In Marrakech, the Toubkal National Park offices are under the same roof as those of the Department of Water and Forestry. This is no coincidence. The distillation project was ideally suited for the TNP development plan and provided a model reproducible in other regions, a by-product of the Department of Water and Forestry. Under the new directives, the Department of Water and Forestry was required to adopt participatory approaches and to strengthen partnership with local stakeholders, NGOs and other bodies (such as forestry enterprises), cooperatives, and institutional partners (such as the departments of Agriculture, the Interior, Energy and Environment). However, there are no decentralised laws regarding the domain of forestry, and legislation remains at the national level. The *Dahir* of 1917 regarding conservation and exploitation of forest resources remains in force and is likely to continue to do so. As the director of the Direction Régionale des Eaux et Forêts (DREFF) said to me in an interview: 'We will never go back to the old system where people used to access the land freely'. With an allocated budget of 813.346.000 dirham for 2008, and considering that Moroccan forest products contribute only 5% to the agricultural GNP and 1% to the total GNP (Zaidi 2007), this does not come as a surprise. When the Department of Water and Forestry stipulates in its new political guidelines that it wants to create real partnerships between rural communities and the state, in practice this seems to involve local associations and cooperatives working for the government. That is not to say that the Department of Water and Forestry is not under pressure to include local populations in participatory approaches. Their role is now to take into account the communities' socio-economic conditions in political decision-making, at least on paper. However, the local population working as a work force stands as a better option. Undoubtedly, this will contribute to the statistical data

needed to meet the requirements of the international funding agencies and to satisfy the administrative record-keeping. It will in turn feed back to the international monitoring reports, but it will also serve its purpose in achieving the desired goals.

The Department of Water and Forestry seems to have a problem when it comes to deciding what is in their best interest in agreeing contracts and in negotiating thyme harvesting quota and prices. In 2007, it prohibited the harvesting of thyme, supposedly to allow for regeneration. This led to considerable financial hardship for the villagers. However, in 2008, under pressure from the High Commissioner asking why the project had not yet started and unsure of how much land should be allocated for the delivery of the official papers for the Cooperative to start operating, the Department allocated 150 hectares for cultivation, and a harvesting quota of two tons for El Maghzen. This authorisation had to be delivered via the commune of Ijoukak who obviously agreed to the access. The quota was unrealistic considering that this amount was only what a family could collect in one week. The High Commissioner rejected the proposed for 150 hectares and wanted instead a three-year contract. In the Agoundis valley, the prohibition on collecting thyme did not stop other villages from harvesting, as people were financially desperate. In the midst of the confusion, the hardship of the villagers and patience running thin, the President and the Treasurer of the Cooperative borrowed 40 000 dirham as there was not enough to pay the harvesters. A middleman from the Ourika valley, eager to get a supply of thyme, lent the money with interest. Clearly, there was internal pressure to start operating independently of the institutional partners. The political situation and conditions imposed by the institutional partners, prevented development at the Cooperative, even though there was a strong willingness to work and preparedness to negotiate independently. The President of the Cooperative and Association had already planned to charge the inhabitants of Tijrichte an extra 0, 25 dirham per kg of thyme harvested to access the Wijdane Mountain. In all good intention, remuneration did occur and harvesters paid according to the amount collected. Despite the fact that local men were guarding the harvested thyme that was destined for the cooperative, some members of the cooperative sold a quantity informally.

As I have described in Chapter 5, an estimated 600 tons of thyme over an average period of two months is collected in the Agoundis valley informally and added to the adjacent valley's official collection. To leave the valley, this merchandise requires the official Department of Water and Forestry stamp. Clearly, the Cooperative's rights to negotiate directly with outsiders may not be favourable to all in the department.

Drawing-up contracts with the Department of Water and Forestry is a common problem throughout Morocco. I had encountered a similar situation when the Institut de Recherche et de Développement (IRD) asked me to conduct some research on a women's cooperative producing aromatic and medicinal plants in Essouira. While visiting the local Department of Water and Forestry office, I witnessed a negotiation concerning the price of thyme. The responsible official was enquiring about the price of thyme per kilogram prior to his meeting with the Cooperative secretary. They had to draw-up a contract to enable women to harvest thyme in the mountains. He was obviously ignorant of the quantities of thyme and the prices that the Cooperative should pay. Unsure of what action to take, the women of the Cooperative were granted the right to harvest a few kilograms in exchange for protecting the site in the mountains.

Once initiatives had been set in motion, the authorities must pursue their engagement with international donor agencies. The Toubkal National Park requested a female US Peace Corps volunteer that the Department of Water and Forestry recommended. Her assignment was to 'empower' the women involved in the (still non-operational) project to build capacity, including project development and management skills, to introduce new ideas to diversify income generation, encourage women's development activities, literacy programmes, ecotourism promotion, environmental education in the local school, and fruit and forest tree planting incentives. This was a heavy schedule for a period of two years. It was unrealistic to assume that people's lives and circumstances could be turned around within this short span of time. However, the mission was designed to restore the relationship with the Toubkal National Park, which had deteriorated, and to try to win over the local population, who were perceived as the cause of natural resources deterioration. The young woman needed to find out what was actually happening with the Cooperative and requested my help. I informed her that it was neither appropriate nor fair to disclose any information as circumstances were complicated enough as they were. She spent most of her time locked away in her host family house, questioning the objectives of her assignment, feeling misplaced and trapped in village life, particularly as she had to report to the local authorities or the President of the Cooperative about every move that she made. She found life in the village impossible, and eventually decided to ask for another assignment. Her superior in Rabat informed her: 'This is your chance to do something for this community. You should start a project that will change these people's lives.' Back in the village, frustrated, she came to see me and said: 'How can I change anyone around here? Who

am I to change anything! She eventually got a different assignment in a more accessible location.

During my period in the field there was an increasing demand for quality standards and labelling and in particular for compliance with a new programme to certify essential oils and other MAP products from four cooperatives, including CADEFA in the Agoundis valley. This GEF programme under the leadership of the High Commissioner of Water and Forestry and Fight against Desertification (HCEFLCD) had an allocated total budget of \$ 4,325 million for 2010-2012. The programme called 'Mainstreaming Biodiversity into Value Chains for Medicinal and Aromatic Plants in Morocco' aims to certify 'Wild crafted' products. Its goal is to strengthen the capacity of Moroccan government institutions, NGOs and the 'concerned' citizens and to contribute towards biodiversity conservation and poverty alleviation by increasing the value of wild-crafted MAPs and their market access, while ensuring sustainability (GEF 2010). This new initiative put further pressure on an unprepared local community.

8.8 Relations between institutional partners

In terms of understanding the problems of implementing projects, one of the most revealing episodes that occurred during my field research was the conflict between the NGO from Marrakech, GTZ, the Department of Water and Forestry, and Toubkal National Park. The project had already become a political issue between the communes of Ijoukak and Talat n'Yakoub in 2008, who disputed ownership of the pilot project. However, the incident between the 'Centre de développement de la région du Tensift' (CDRT) and GTZ revealed major differences in the approaches and objectives of the two institutional partners. The German Society for Technical Cooperation (GTZ) is an organisation supported by the Federal Government to achieve its development policy objectives. It offers sustainable solutions for political, economic, ecological and social development in a globalized world and promotes complex reforms and change processes, often under difficult conditions. It aims to improve the living conditions of people. GTZ has been working in Morocco since the 1960s. It prioritises economic development, environmental protection and the conservation of water resources. It has been a partner in the distillation project because of its involvement in the development of national parks in Morocco, hence, in recent years, Toubkal National Park in particular. It has been working in collaboration with the High Commissioner of Water

and Forestry and Fight against Desertification (HCEFLCD) over the last few years. The two institutions (the Department of Water and Forestry and GTZ) have had a long-term relationship and GTZ is now the new actor facilitating this participatory process. They are able to work towards achieving the Ministry of Interior's agenda, i.e. the efficient and resourceful management of the country's national parks, biological sites and overcoming the resistance of local populations. The connection between GTZ and CDRT, therefore, has been as partners with the Toubkal National Park and its strategies to develop the valleys within the vicinity of the park. GTZ has paid for a biomass study, and further allocated 40 000 dirham for a fruit drying unit that the women could use in a project, which had yet to be defined, but which could also be used for drying medicinal plants.

Following delays in the allocation of money at the commune level, the release of the contract between the Department of Water and Forestry and the Cooperative (CADEFA), the High Commissioner was under considerable pressure to move the project on. This in turn put pressure on the Department of Water and Forestry in Marrakech. The CDRT, still not quite ready to release the biomass results, was in turn pressurised. The NGO, as the initiator and coordinator of the project did all the ground work and had made the suggestion that a biomass study be undertaken. Exacerbated by an already tense relationship between CDRT and Toubkal National Park, the director of TNP accused CDRT of appropriating the biomass results. GTZ demanded the results but CDRT refused to release them on the grounds that it was not an advice bureau but a partner in the project. GTZ therefore blocked the 20 000 dirham for the biomass study. This revealed already fundamental underlying differences. The CDRT coordinator as well as the President of the Cooperative already doing all the groundwork complained of the non-attendance of the institutional partners at commune meetings in Ijoukak. The dissatisfaction in working with the Department of Water and Forestry had been manifested as early as 2007. The coordinator of the project had spent a lot of time in the valley, regularly visiting Ijoukak and doing fieldwork in the villages, a commitment few were prepared to make. The normal sequence for participatory research was a quick visit up the valley in a four-by-four truck, a few hours spent in situ and a conversation accompanied by *tajine* and tea, and out again.

The project had received sums of money. The meeting of deadlines set by the higher accountable to higher institutions is imperative. These in turn respond to descending pressures. All things had been connected, or at least all organisations had

been connected, except that the CDRT isolated itself from GTZ, the Department of Water and Forestry and Toubkal National Park. To be fair, this situation was most unfavourable to the local population caught in the middle of internal political affairs which resulted in further delays. The institutional partner heavily criticized and discredited the coordinator of the NGO, who lost his status and respect in the valley. It would seem that the local people, and in particular the president of the Cooperative influenced by these false allegations, had forgotten the groundwork undertaken by the NGO coordinator. Following this unfortunate event, the Director of the Toubkal National Park in Marrakech and the GTZ coordinator in Rabat resigned. As GTZ and the Department of Water and Forestry pressed on with implementation of the project, to meet the deadlines and be ready for the next step, the High Commissioner and higher GTZ authorities in Rabat requested that an independent team conduct the biomass evaluation and the extraction of essential oil. A team of INRA engineers and GTZ consultants from Rabat eventually undertook the study in 2008.

In October 2008, the new director of the Toubkal National Park invited me to Tahannaoute where the results of the plant biomass and essential oil yield extraction studies would be released. I had first met the new director of the park, a woman, shortly after the resignation of the previous director. The meeting was chaired by the governor and official members of the Cooperative were obliged to attend although they were ignorant of the internal politics, the problems that the project was facing and felt and looked totally misplaced, away from the village. As the meeting was unfolding, I could not help interfering and requesting that the people should be heard. The physical positioning was very revealing: officials placed around the big polished oval table and the Berbers in their *djellabas* standing at the back in a second row. When asked what the Cooperative wanted to do, the President said: 'Give us the money and the technical assistance and we'll do the rest'. At some point during the meeting, someone raised the subject of the *jama'a* and its land access and enquired: 'Is there any possibility that we could go back to the old institution?' This did not seem to please the authorities, and the director of the local Department of Water and Forestry addressed the Cooperative members standing behind: 'You should be happy, we used to reprimand you, now we are trying to find solutions to include you in the programmes!'

Shortly after these events, I received a letter from the Director of the Toubkal National Park. The Director asked me not to disclose the biomass and other results that I had heard at the meeting. They were concerned that I would disclose this information to

CDRT. This clarified to me the reasons why I had been invited to the provincial level meeting. Various people present on that day expected me to disclose my already collated results and other information. To me, the disclosure of my unfinished results and what I overheard at the meeting was unethical. Later in November 2008, I was participating at an international colloquium on sustainable development in Marrakech, where the official responsible for eco-development in the Toubkal National Park aggressively pressurised me to release my results.

8.9 The roles of cooperative secretary and president

At the village level, at least in terms of issues relating to the distillation project, power lies with the president of the Cooperative, and to a lesser extent with its female secretary. Because of her school education and because she volunteered to do something for the village in the early development programme initiatives, she had been chosen to work for the women's illiteracy programme in 2004. As incentives were unfolding around the village, the Toubkal National Park office in Marrakech offered her training as part of a local development initiative. By that time, she was gaining respect amongst the village women because she was working hard to do something with the women's association activities, organising groups so that an effective rotation of teams could operate to produce homemade biscuits and couscous. Although she became increasingly absent from the village because of her busy schedule of meetings, and training sessions required by the different funding programmes in Tahannaoute, Agadir and Rabat, her confidence and reputation in the village was boosted considerably when she was photographed with the king. This occurred during an official visit to the province for a display of craft and aromatic and medicinal plants. Caught between conflicting political pressures of the Department of Water and Forestry, Toubkal National Park and the Department of Agriculture, she extricated herself by opting to inaugurate a local branch of a micro-credit foundation. Increasingly involved with this work, and therefore unable to fulfil her duties towards the community, she nonetheless still served as Secretary of the Cooperative. With the teaching in the village in the early stages, the photograph with the king and now working for the local micro-credit foundation, she acquired a status in the village that she was reluctant to forego. I encountered a similar situation in Essouira while conducting research for the Institut de recherche et de développement (IRD). There, members related to the same family high-jacked the women's

Cooperative for the development of aromatic and medicinal plants and it became impossible for other women in the neighbouring villages to take up membership.

In El Maghzen, activities eventually came to a halt, as the women's association became increasingly the focus of disputes. Personal profit prevailed over the general interest as the treasurer of the association cashed in the income from the local sale of biscuits and couscous. I had many regular meetings with the women, trying to identify and encourage the strongest elements for leadership. However, unable to see the long-term benefits of the enterprise, and preferring a short-term hand out, women were fighting over a few petty unpaid dirhams. The women's activities in the village will not function without a strong pillar. A civil servant from Ijoukak told me during an informal interview: 'The people up there need help. They will not achieve anything by themselves. The project can only work if someone external helps'. It is now clear that any initiative requires a constant presence to encourage and monitor the activities. The women offered me the position of president of the association. This was a very flattering offer that I could not accept, at least not while I was researching.

The Cooperative required that the president be from a *fellah* (agricultural) background. At the time of its creation, a president was selected who had no particular interest in or knowledge about the position. During one of our interviews, he did not seem to know what his responsibilities were and why he had been chosen. However, he soon learned that he could use his status as president to exercise power. He attended and participated in all meetings held at the commune and provincial levels, accepting their decisions. Unlike the secretary who was remunerated for her initial work in the village, the president was never paid. From his point of view, this was an injustice that he never understood. Lost in the complexity of development affairs, he often sought advice from Marrakech. However, his innocence in local politics eventually worked to his advantage. On the one hand, he was able to gather a lot of information while attending meetings on local politics and the implementation of programme initiatives and events. Keeping this information to himself, this put him in a good position to counter opposition and to control the valley activities. An illustration of this is the control that he exerted over the thyme harvest. The disruptive conflict between the institutions and the Department of Water and Forestry's indecision over the allocation of land created much confusion. To add to the havoc, the harvesting of thyme on only the 150 hectares permitted by the Department of Water and Forestry was unrealistic for the villagers. Pressurised by higher authorities, the *caid* strictly forbade all middlemen from

conducting transactions in the valley. Although the thyme harvest was destined for distillation and stored in a locked facility, the president proceeded to undisclosed operations, organising transport despite the *caid*'s strict orders. Therefore, he had a double role. Well-informed because his attendance at meetings, he could orchestrate manoeuvres in times of confusion. In the event of failure of the project, this put him as a prime agent for the negotiating of thyme, a first class middleman. If the project went ahead, which increasingly looked possible now that GTZ had taken control following the conflict, his role as a president of the Cooperative would be reinforced, as he was unlikely to be replaced. Regardless of the project outcome, he might even keep both functions as and when distillation begins.

However, the President's power was not limited to the trade in thyme. In April 2008, a French humanitarian convoy arrived in El Maghzen. Trucks were loaded with tables, chairs, desks and blackboards to refurbish the women's classrooms in El Maghzen and two other nearby villages. The French association A-C-E-H-M-A-M (Association de Culture et d'Echange avec le Haut Atlas et le Moyen Atlas Marocain) had also provided bags of clothes for the families, and flour was bought in Ijoukak with the money that the association collected. Each household was therefore to receive an equal amount of the goods. A previous verbal agreement turned out to be the cause of a major disruptive event in the village. The President had decided that no item would leave the locked garages where the material was stored, a chaotic situation that he turned to his advantage in the *khalifa*'s office. The women were then quick to hide away the flour and the clothes fearing that the men would steal the material to sell in the local *souk*.

I encountered another problem with the president when I was trying to boost the role of the women's association. As I was encouraging the women to take the initiative in electing new responsible and enthusiastic leaders, at the women's request, the president intervened. He emphasised that he was the only person entitled to take such decisions. He would rather favour close family connections. Therefore, it would seem that any local initiative has to break through two barriers, the president of the Cooperative and the local authorities. Many members of the Cooperative living in distant villages complained about him. His lack of skills, lack of drive for the common good and his desire to remain in control were all criticised. Members of the Cooperative suggested his replacement though their actions were constrained by their primary concern for their own economic well-being in an area where resources were limited.

What is more, the enrolment of others to one's cause is easy as deals and transactions cannot occur without the participation of willing subjects wanting to acquire some financial benefit. To replace him could be a gamble because of his participation in all meetings, and his knowledge of procedures. To find someone willing to work for the common good did not stand as an obvious option in a very intricate and sensitive project situation.

8.10 Conclusion

In this chapter, I have described from a top-down perspective the institutional mechanisms for implementing the distillation project, and the events that unfolded from early 2007 up until the time I left El Maghzen in April 2009. It can be seen how the project lacked clear directives and coordination, almost from the beginning. The chapter also reveals the underlying motivations of the institutional players. However, while confusion and conflict are evident in terms of the direction for the initiatives, what is most apparent is that the local populations were the least considered. The inability of the bureaucratic point of view to see this further exacerbated the villagers, leading to frustration and resentment.

In Chapter 9, I will describe how the project was perceived at the village level, and what it meant for the local population as a potential socio-economic lever to improve their living conditions. I will also discuss the population's scepticism and the reasons why they had little faith in the authorities.

CHAPTER 9

The Agoundis Valley Distillation Project: A Grass roots Perspective

9.1 Introduction

In this chapter, I will attempt to analyse the project from the perspective of the local people, rather than as part of a wider political process. The data discussed are based mainly on a survey conducted during the period June to November 2007 and from January to March 2008. I will describe how people responded to the prospect of the project, their expectations, and the impact that they anticipated this would have on their daily lives, and most importantly, how they thought it might address the key development needs of the Agoundis Valley. I will also describe local perceptions of the authorities and local involvement in project implementation. I will show that a major problem was lack of communication and of participation in the villages. I will indicate how little information about the project and the production of essential oil distillation was circulating in the villages. I will attempt to explain people's scepticism regarding implementation of the project.

9.2 Perceptions of the project in the villages

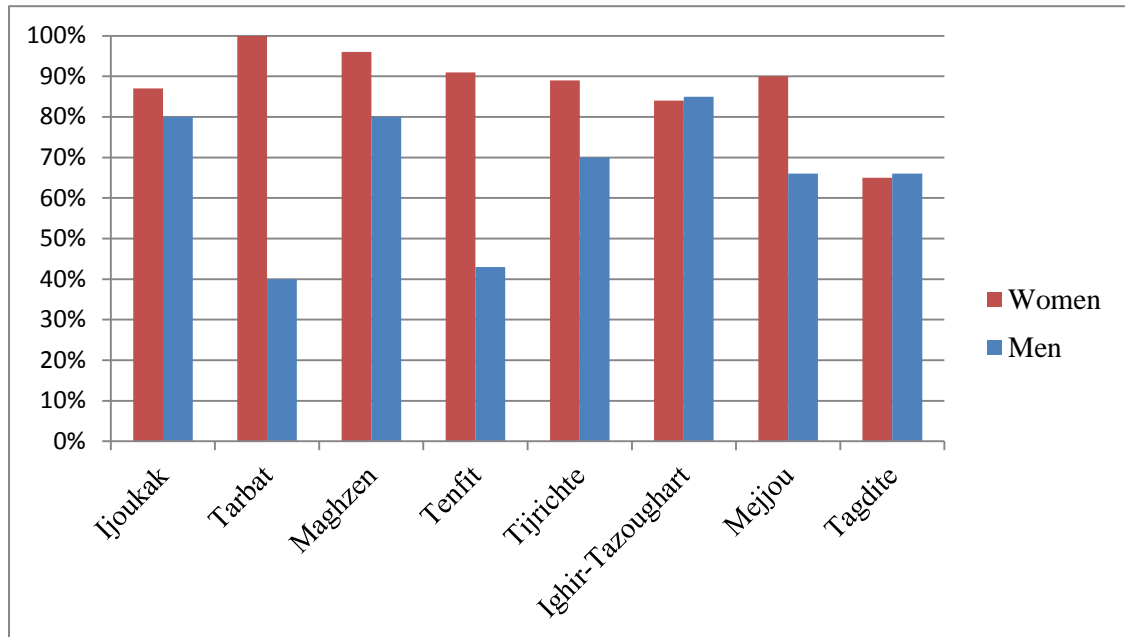
The distillation project had initially raised a lot of hope locally. When conducting my survey in the villages between June 2007 and March 2008 on what local residents thought of the project, there seemed to be some very positive responses, not only from the higher (and therefore more remote) villages of the valley, who might expect to benefit more from the project (Mejjou, Tenfit, Ighir-Tazoughart and Tijrichte), but also from the lower villages of Tarbat and Ijoukak (figure 9.1). People agreed that the project provided work for those who wanted it and was a good source of income. Women, who generally have a hard life and who vocalised their resentment of just having to care for animals, saw the project as a unique opportunity to increase their income and were keen to get involved. Women were ambitious and expressed a willingness to improve their life and family conditions despite their confinement to village life. Although women were enthusiastic about the project, in reality, the opportunities were fewer for women

than for men and it was harder for them to access the labour market. However, women were increasingly attracted by the prospect of an increased cash income, influenced by television, occasional travel to the cities and through relations with relatively cash-rich family members from Marrakech, Casablanca or Rabat who occasionally visit the villages. Such rural-urban links are extensive in most villages, though to a lesser extent in Ighir-Tazoughart and Tagdite which are the highest villages in the valley and therefore more difficult to reach. They tend to be less visited by family relations except for celebrations such as Aid Al Fitr and for weddings.

However, in El Maghzen and Tagdite, people were more sceptical about the distillation project. One reason for this may have been that in El Maghzen, the central focus for the project, the president of the cooperative had circulated a lot of information about associated problems and this may have influenced opinions. Tagdite, being the highest and most remote village, also indicated a low percentage of the population favouring the project. The reason here is that there is no programme currently planned for a village at such a high altitude, while its remoteness anyway decreased its bureaucratic visibility. Throughout the valley, many people did not know what to think, even though expectations were high. Many claimed that they had not seen any evidence of the project (6% of women and 11% of men in El Maghzen, 21% of women and 19% of men in Tagdite, 10% of women and 13% of men in Mejjou, and 15% of men in Tenfit, 10% of women in Ighir-Tazoughart, 11% of women and 5% of men in Tijrichte).

People were genuinely concerned as to whether the project was going to succeed or not and were disillusioned that nothing had so far happened. This was particularly the case for the men of Tenfit (40%) and Ighir-Tazoughart (15%) and to a lesser extent for women from these places (9%) and (8%). Many people thought that its success was dependent on good leadership and serious cooperation (8% of men in El Maghzen, 15% of women and 5% of men in Tagdite, 22% of men in Mejjou, 25% of men in Tijrichte, and 3% of women and 20% of men in Ijoukak). What is more, 50% of men in Tarbat noted that at the time of the survey the project was not up and running. People indicated that they used to place trust in the project but now thought that the project was not working. In addition, there seemed to be considerable awareness that thyme was going to be a major factor in project success and that a plentiful supply was dependent on rain and on other favourable climatic conditions.

Fig 9.1: Percentage of Agoundis valley population favouring the distillation project



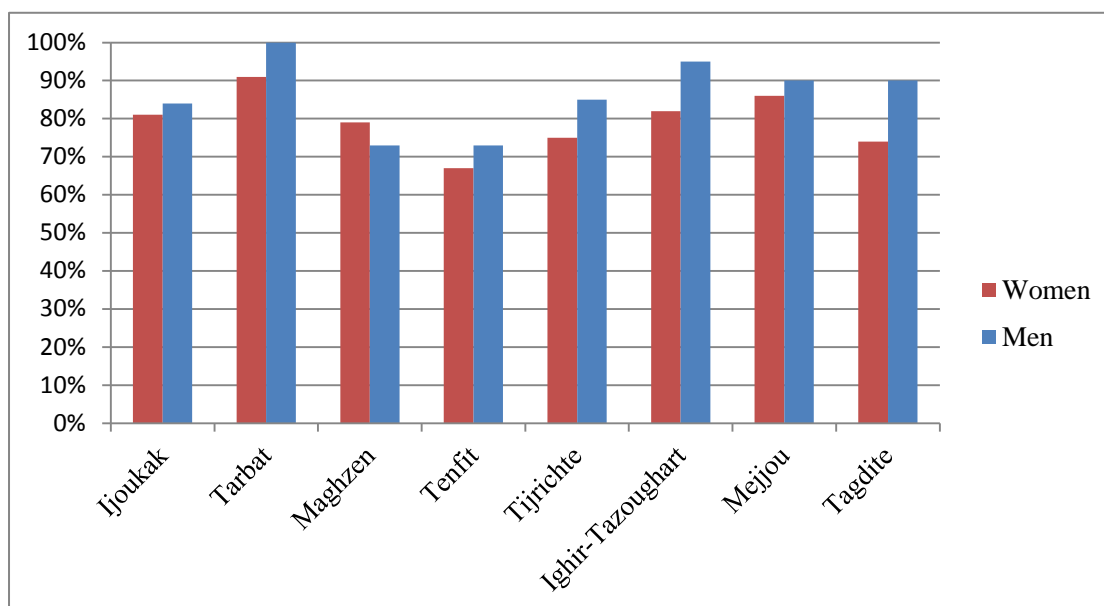
9.3 Willingness to work on the project

Despite scepticism concerning implementation of the project, most people responded that they were willing to participate. In El Maghzen, 79% of women and 73% of men were prepared to work with the project. Indeed, people throughout the valley as a whole were strongly committed: 74% of women and 90% of men in Tagdite, 86% of women and 100% of men in Mejjou, 67% of women and 73 % of men in Tenfit, 82% of women and 95 % of men in Ighir-Tazoughart, 75% of women and 85% of men in Tijrichte, 91% of women and 100% of men in Tarbat and 81% of women and 84% in Ijoukak (figure 9.2). These attitudes are much more pronounced in the numbers presented in figure 9.2 for men, than in those presented in figure 9.1 for women, because men are more likely to have already been involved in the labour market and be more available for work than women. People indicated their willingness to dedicate time to the project, or share their time between routine activities and the project. Women noted that at present the thyme harvest was just for a period of two months and a half a year, and that this income was not enough to live on. Some women who did not collect thyme in the past were now willing to collect and sell to the cooperative. Men hoped that the project would be a catalyst to move on to other projects. They were ready to allocate time between their daily subsistence activities and the project. Generally men would rather

find or create employment to stay and work in the villages rather than go to the cities, away from their families. Some men, especially in the higher village of Tagdite saw the project as an opportunity to become middlemen. Tagdite offers very few economic opportunities and to become a middleman not only provides work but also a status within the community. Others indicated that it was important for them and for their children's future, and that if jobs were available, they were ready to work. However, 6% of women and 9% of men in El Maghzen, 14% of women in Mejjou, 24% of women in Tenfit, 5% of men in Tijrichte, and 7% of women in Ijoukak did not know whether they wanted to work in the project. Some people indicated that they would do so but only if it succeeded (11% of women and 12% of men in El Maghzen, 9% of women and 10% of men in Tagdite, 8% of women and 5% of men in Ighir-Tazoughart, 12% of men in Ijoukak). People emphasised that they could only work providing that thyme was available. Men on the whole preferred long-term employment in the villages rather than having to leave the village for urban areas.

Furthermore, there was some concern about the extent to which participation might be affected by health, and age. Among female respondents, this was expressed by 4% in El Maghzen, 6% in Tagdite, 9% in Tenfit, 5% in Ighir-Tazoughart, and 6% in Ijoukak. Age was thought to be a problematic factor in relation to harvesting for 12% of men in Tenfit, 18% of women in Tijrichte and 6% of women in Ijoukak. Some people reported that if they did not participate then their son would. Time availability was a general problem mentioned by women because of domestic responsibilities: 11% in Tagdite, 5% in Ighir-Tazoughart, 7% in Tijrichte, 9% in Tarbat, and 6% in Ijoukak. Other people, mainly men, indicated that they were not available mainly because they worked away from the valley (6% in El Maghzen, 15% in Tenfit, 10% in Tijrichte and 4% in Ijoukak).

Fig 9.2: Percentage of Agoundis valley population expressing willingness to work with distillation project



9.4 The will to earn an income

Most inhabitants of the villages thought that they could earn some money from the project (tables 9.1; 9.2). People indicated that if the project was successful and if there was money available, they probably would be able to earn a reasonable income. Villagers were aware of the low remuneration rates for collecting thyme, and expressed a desire to increase their wages. They emphasised that they were tired of getting so little money for the hard work involved in the harvesting. People were aware that increasing one's income was very much dependent on the availability of thyme and if there was no rain, there would be no thyme.

However, there was some scepticism voiced. Some people still did not know whether they would earn money in the project. Some people in Tenfit were disappointed as the president of the cooperative had originally informed them that they would be the first to benefit from the project. The disappointment was reinforced because people had so far received nothing. People in Tarbat did not know either and expressed the view that payment was not straightforward because of corruption. Others did not think that they could earn money, and were unsure whether they wanted to be involved. Nevertheless, people thought that it was in their interest to support the project.

Table 9.1: Percentage of female responses to the question: Do you think you can earn money from the project?

	El Maghzen	Tagdite	Mejjou	Tenfit	Ighir-Tazoughart	Tijrichte	Tarbat	Ijoukak
I can earn money from the project	67%	61%	70%	90%	62%	89%	73%	53%
I would like to increase my income from harvesting	6%	6%	X	X	14%	X	X	14%
I will earn money if there is enough thyme	X	X	X	X	5%	7%	10%	5%
Do not know	8%	18%	15%	10%	X	X	17%	16%
It is in our interest to support the project	15%	15%	10%	X	10%	4%	X	3%
I do not think I can earn money from the project	4%	X	5%	X	9%	X	X	9%

X= no responses volunteered in this category

Table 9.2: Percentage of male responses to the question: Do you think you can earn money from the project?

	El Maghzen	Tagdite	Mejjou	Tenfit	Ighir-Tazoughart	Tijrichte	Tarbat	Ijoukak
I can earn money from the project	45%	65%	82%	43%	72%	50%	73%	80%
I would like to increase my income from harvesting	23%	22%	X	X	10%	X	X	8%
I will earn money if there is enough thyme	X	X	X	X	X	5%	11%	X
Do not know	14%	X	11%	42%	X	25%	16%	8%
It is in our interest to support the project	12%	13%	7%	15%	18%	10%	X	4%
I do not think I can earn money from the project	6%	X	X	X	X	10%	X	X

X = no responses volunteered in this category

9.5 How people anticipated using distillation project income

To assess the socio-economic needs of the local population and to determine the extent to which the project could meet these, it was important to identify how people would spend the money earned from the project (table 9.3). In most villages, people prioritised essential household needs and items that they could buy in the local market (tea, gas, flour, meat, candles). These requirements were particularly high in the villages of Ighir-Tazoughart. In Ijoukak, the figures were lower (19% for women and 8% for men), presumably because of its location on a main transport axis, its proximity to shops and to more readily accessible wage labour, either locally or in Marrakech. Ironically, in Tarbat where many men are able to work in Marrakech or Casablanca and therefore were already in receipt of a steady cash income, 28% of women and 40% of men stated that they would still spend the money on household needs because of low wages and high expenses of urban work.

The population expressed a desire to build houses: 11% of women and 3% of men in El Maghzen, 18% of women and 5% of men in Tagdite, 16% of women and 25% of men in Mejjou, 18% of women and 15% of men in Tenfit, 18% of women in Ighir-Tazoughart, 14% of women and 15% of men in Tijrichte, 21% of women and 4% of men in Ijoukak. The figures are notably higher for women than for men. Many families live together under one roof and there may be a desire to live independently. Although traditionally newly married women have to move to their husband's household, the situation may not always be harmonious. In addition, there is a desire to build houses in Marrakech or Agadir, particularly amongst older people. Women rather than men had a strong desire to refurbish the house. This included beds, armchairs, fridges, washing machines and other house equipment that most households presently do not possess. Buying clothes for children was important. Most families benefit from the distribution of second hand clothes and children generally do not have good shoes. Such sentiments were more likely to be expressed – at one extreme - in Tarbat (16% of women and 20% of men in Tarbat) than in Maghzen (3% women and 2% men) – at the other.

Personal effects and improvement were also important in the villages. Throughout the valley, people expressed aspirations and ambitions. These ranged from the desire to own a sewing machine, and having one's teeth repaired, to doing something for the environment (such as recycling village rubbish), to buying medicines, books, and 'an education'. The ownership of animals is highly important for most

villagers. Not only does it symbolise wealth for a family but it also provides important dietary supplements as well as being a crucial buffer in times of crisis. Jewellery, as an external sign of wealth, is important for women, and if earning money, women would rather invest in gold than silver. This was particularly prevalent amongst the women in Tarbat. Women and men were also keen to learn to read and to buy books for themselves and for their children. There was a great concern about being able to help the family and to secure the children's future.

Marriage and religion are important. This was emphasised particularly in the case of Ighir-Tazoughart, Tagdite and Tijrichte. For boys, married status symbolises the passage to manhood. However, marriage also implies acquisition of dowry for the bride, paid in jewellery and goods for the home. Living within the same family compound can be difficult. Younger people have expressed the wish to build a house to be able to live separately from the traditional household (see above). Quite a few young people in the villages remain unmarried for economic conditions, involving a combination of factors that include the lack of financial means and a growing wish for independence among young women.

Devoutness in the valley was expressed in the desire by many to go to Saudi Arabia for the *haj* pilgrimage. A journey to Mecca in one's lifetime was important for most elderly people.

Transport in the valley is a problem. Apart from trucks that serve as public transport, people travel mainly by foot, mule or donkey. People therefore often expressed a wish to acquire a vehicle. Many men stated that they were waiting for the project to start before deciding how they would spend the money. Men in particular showed a strong desire to start up small business ventures: 50% of men and 4% of women and in El Maghzen, 41% of men and 3% of women in Tagdite, 20% of men and 13% of women in Mejjou, 15% of men and 9% of women in Tenfit, 24% of men in Ighir-Tazoughart, 30% of men and 14% of women in Tijrichte, 30% of men and 26% of women and in Tarbat, and a high of 64% of men and 14% of women in Ijoukak. Aspirations included a butchers shop, a bakery, a grocery shop and a telephone boutique for men, and jewellery and craft shop for women.

Table 9.3: Examples of types of expenditure anticipated from Agoundis valley distillation project income

Villages	El Maghzen	Tagdite	Mejjou	Tenfit	Ighir-Tazoughart	Tijrichte	Tarbat	Ijoukak
	Female (-Male)	Female (-Male)	Female (-Male)	Female (-Male)	Female (-Male)	Female (-Male)	Female (-Male)	Female (-Male)
Household requisites	28% (21%)	32% (44%)	24% (42%)	17% (58%)	37% (77%)	36% (38%)	28% (40%)	19% (8%)
Personal effects: jewellery, medicine, environmental improvements (e.g. recycling village rubbish), vehicle, helping the family, marriage costs, pilgrimage, cattle acquisition, books, education.	45% (20%)	20%	19% (7%)	13%	20%	15% (15%)	20%	22% (24%)
Housebuilding	11% (3%)	18% (5%)	16% (25%)	18% (15%)	18%	14%	X	21% (4%)
House refurbishment	10% (3%)	15% (5%)	13% (6%)	22%	14%	7%	10% (10%)	16%
Clothing	2% (3%)	12% (5%)	8%	12%	11%	9% (17%)	16% (20%)	8%
Another project	4% (50%)	3% (41%)	13% (20%)	9% (15%)	(24%)	14% (30%)	26% (30%)	14% (64%)
Do not know, waiting for project to start	X	X	7%	9% (12%)	X	5%	X	X

X= no responses volunteered in this category

9.6 Priorities for community infrastructure

In addition to the ways in which people in the valley hoped the project would contribute towards household and personal expenses, they also anticipated that it would contribute towards community infrastructure, such as to a hospital, electricity supply and piped water. At the time of my study, most people resorted to candle light after dusk and so electricity was considered a high priority all over the valley. This was particularly the case in the villages of Tagdite, Mejjou, Tenfit, Ighir-Tazoughart, Tijrichte, Tarbat, and El Maghzen (figures 9.3-9.9 and table 9.4). A hospital was considered an urgent priority in the higher villages, for example in Tagdite and Mejjou (figures 9.3; 9.4), but less so in lower villages such as El Maghzen, Tenfit, and Tarbat. Women overall seemed to be more concerned with this issue than men, given their concerns for reproductive and child health.

Running water is a problem in most villages, especially in the higher locations. Improvements were considered a priority in Ighir-Tazoughart, Tijrichte and Tagdite and even in Ijoukak situated on the main transport axis. Households in El Maghzen had benefited from financial assistance from IFAD with a budget allocation of 40 000 dirham in 2006. The men from the village association were therefore able to refurbish the water system with rubber pipes and taps supplying water from a reliable source. It was, therefore less of a priority for them (figure 9.9). The stated needs of other villages included a school for women and children (El Maghzen), road building and maintenance, clean streets, a telephone network, public baths, a mosque and a small market (Tagdite, Mejjou, Tarbat and Ijoukak). Women expressed the wish to own chickens, sheep, goats and cows, particularly in Ijoukak. All villages favoured improving facilities for women's activities, such as providing a club or workshop to make carpets or clothes, and these were all highly supported by men (Mejjou, Tijrichte, Tarbat, El Maghzen, Ijoukak, figures 9.4; 9.7; 9.10). This is explained by the fact that men would like to see their wives earning money but without having to go outside the village. A few senior women from Tarbat and Ijoukak mentioned that it was important to be able to teach these skills to the younger generations to prevent knowledge loss. The people in El Maghzen, particularly men, hoped that the project would bring another project, presumably because people were disillusioned with the existing non-operational distillation project.

Fig 9.3: Community infrastructure expectations for the distillation project: Tagdite

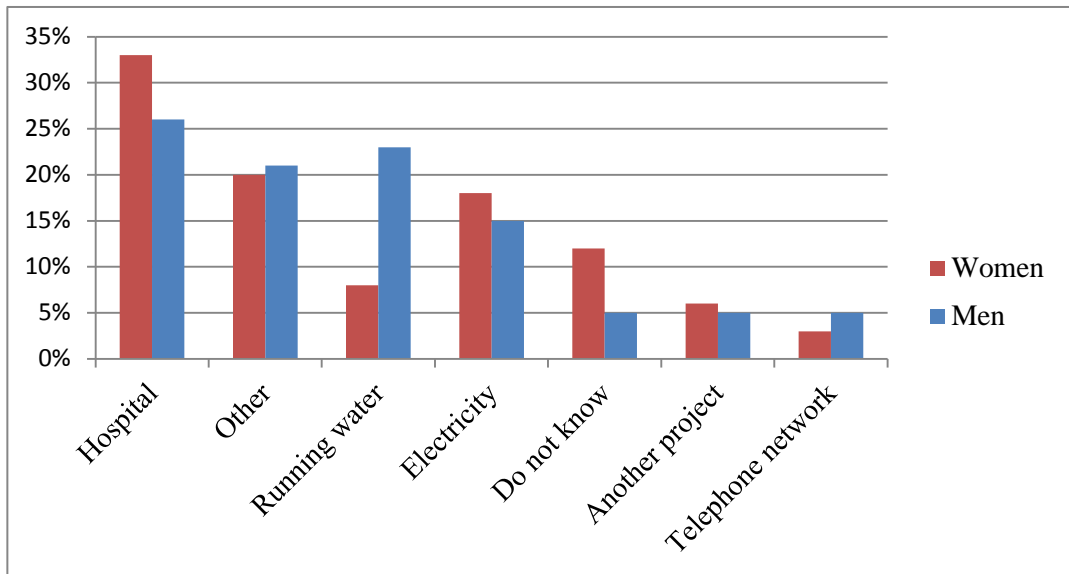


Fig 9.4: Community infrastructure expectations for the distillation project: Mejjou

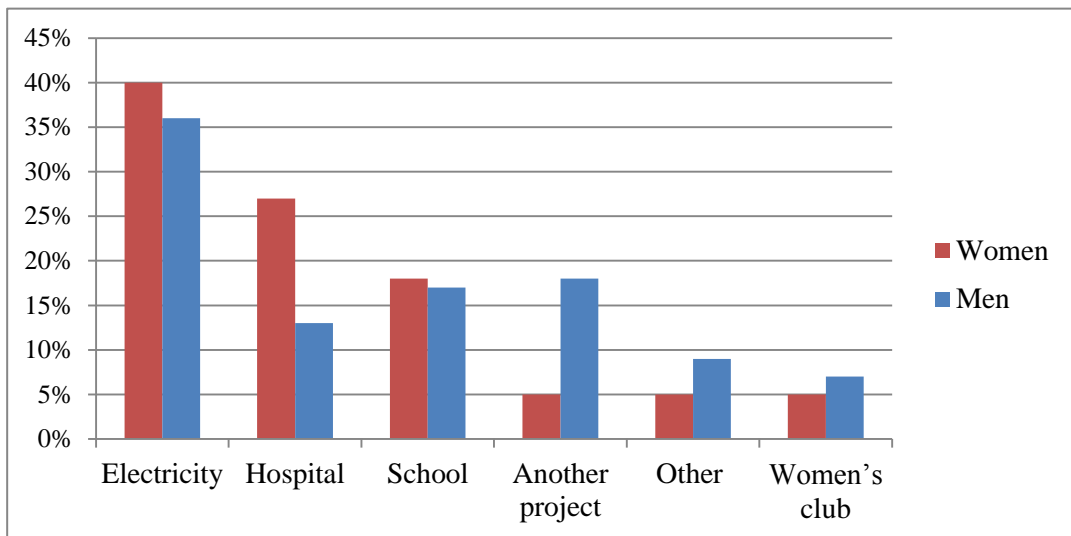


Fig 9.5: Community infrastructure expectations for the distillation project: Tenfit

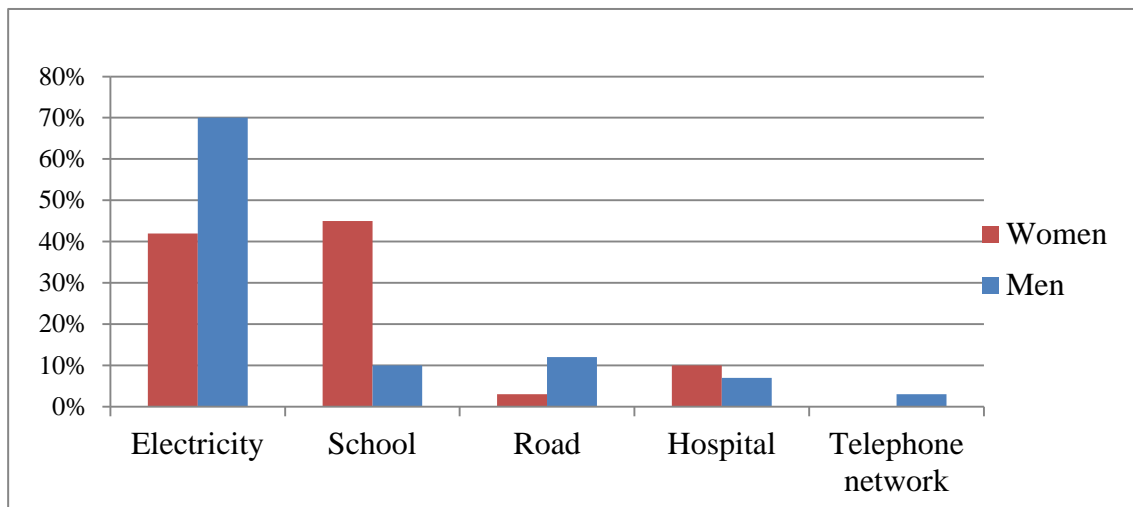


Fig 9.6: Community infrastructure expectations for the distillation project: Ighir-Tazoughart

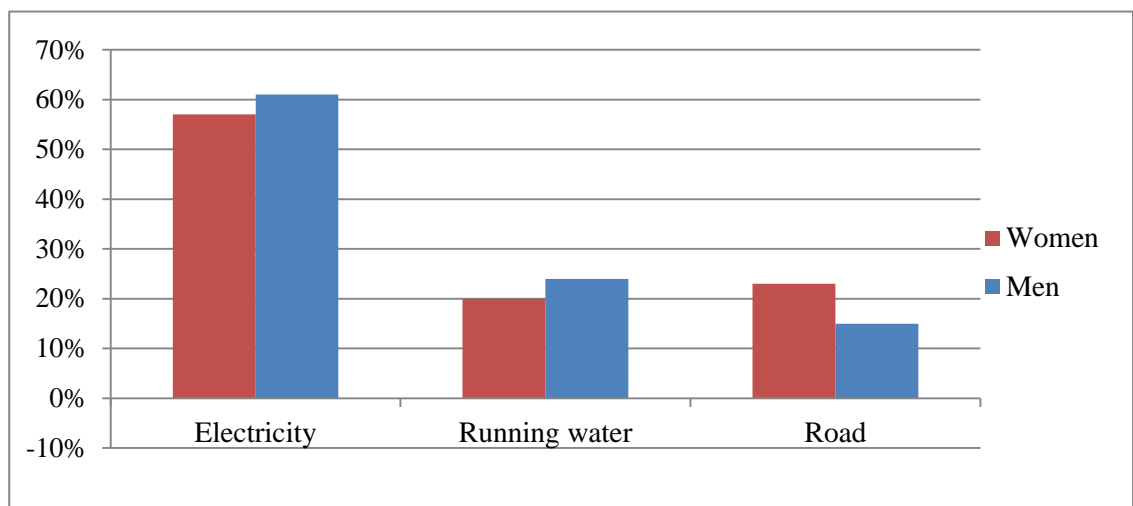


Fig 9.7: Community infrastructure expectations for the distillation project: Tijrichte

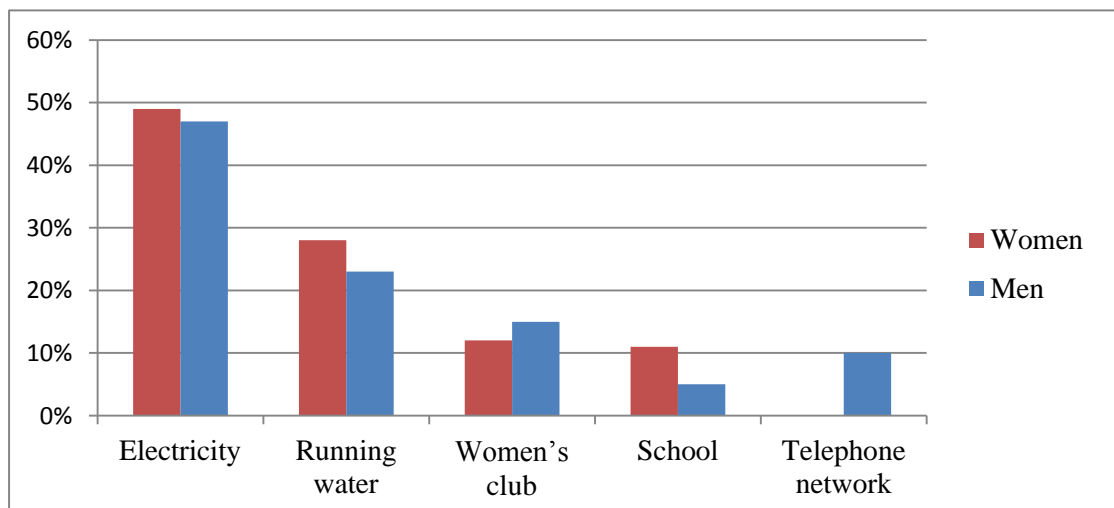


Fig 9.8: Community infrastructure expectations for the distillation project: Tarbat

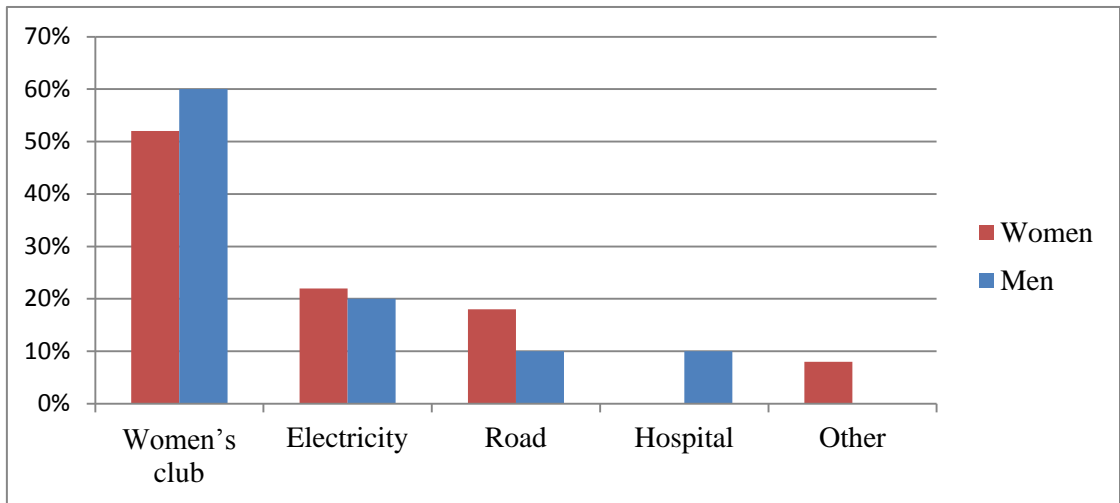


Fig 9.9: Community infrastructure expectations for the distillation project: El Maghzen

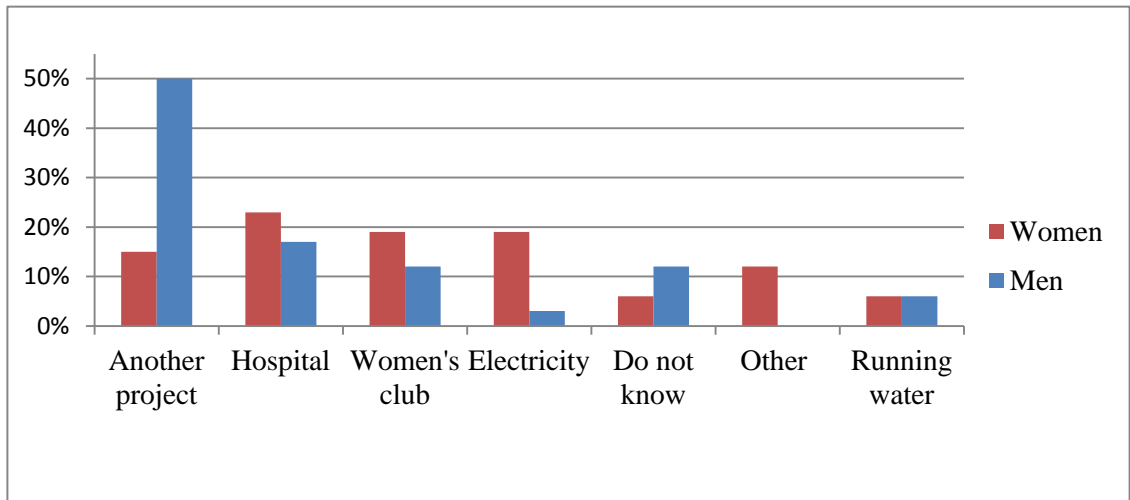


Fig 9.10: Community infrastructure expectations for the distillation project: Ijoukak

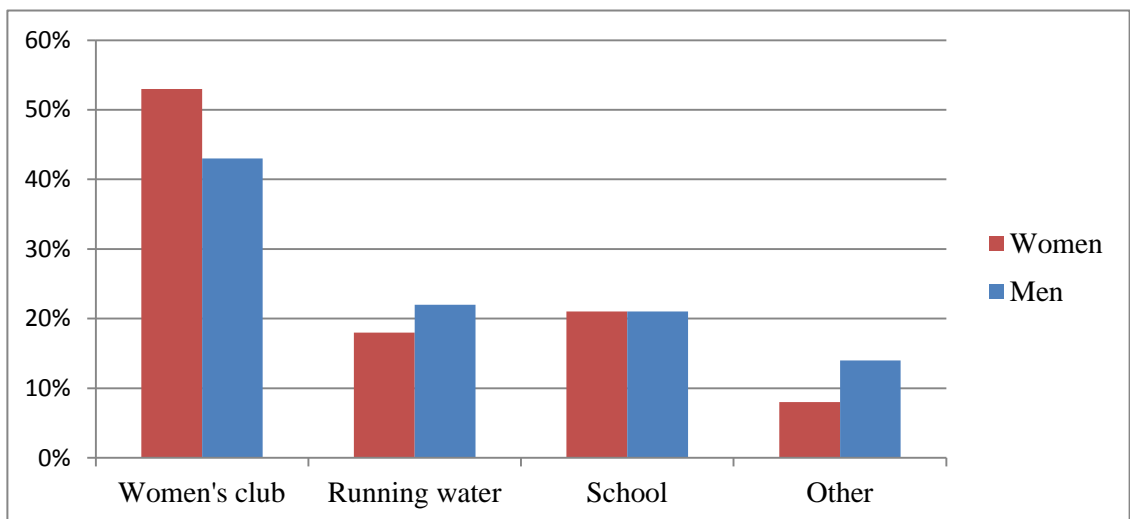


Table 9.4: Comparison of priorities between the villages of the Agoundis valley relating to community infrastructure expectations for the distillation project

Villages	Ijoukak	Tarbat	El Maghzen	Tenfit	Tijrichte	Ighir - Tazoughart	Mejjou	Tagdite
	Female (Male)	Female (Male)	Female (Male)	Female (Male)	Female (Male)	Female (Male)	Female (Male)	Female (Male)
Electricity	X	22% (20%)	19% (3%)	42% (70%)	49% (47%)	57% (61%)	40% (36%)	18% (15%)
Hospital	X	(10%)	23% (17%)	10% (7%)	X	X	27% (13%)	33% (26%)
School	21% (21%)	X	X	45% (10%)	11% (5%)	X	18% (17%)	X
Running water	18% (22%)	X	6% (6%)	X	28% (23%)	20% (24%)	X	8% (23%)
Road	X	18% (10%)	X	3% (10%)	X	23% (15%)	X	X
Telephone network	X	X	X	(3%)	(10%)	X	X	3% (5%)
Another project	X	X	15% (50%)	X	X	X	5% (18%)	6% (5%)
Other	8% (14%)	8%	12%	X	X	X	5% (9%)	20% (21%)
Women's club	53% (43%)	52% (60%)	19% (12%)	X	12% (15%)	X	5% (7%)	X
Do not Know	X	X	6% (12%)	X	X	X	X	12% (5%)

X= no responses volunteered in this category.

9.7 Village perceptions of administrative authorities

In the new government policies operative since 2005 (see Chapter 2), the commune has been assigned the role of mediator for the local communities. The INDH funding allocated for the distillation project building was transferred to the commune of Ijoukak before it was received by the cooperative (see Chapter 8). The new government policies not only promised active participation for the communities but also greater consultation with villagers. Therefore, given the role of the local authorities in authorising and implementing the distillation project, it was important to ascertain village perceptions of their role and effectiveness. Beside the president of the cooperative, who was informed of directives between the authorities, most people believed that the funding for the building came from the commune of Ijoukak, even though its source was at the provincial level. Therefore, there seemed to be a consensus view in the villages of Ijoukak, El Maghzen and Ighir-Tazoughart surveyed in 2007 and 2008, that the commune of Ijoukak had helped with the project (tables 9.4; 9.5).

The figures presented in table 9.4 and 9.5 are responses from informants interviewed from all villages concerned in the project that I visited in 2007. My second visit to the villages in 2008 was merely to complete the interviews and to find the informants who were not available to take part in the interviews during my first visit. There are no fluctuations of opinions regarding the authorities' involvement between these two periods; on the contrary, as events about the project unfolded, people had lost interest and their appreciation of the authorities had declined.

As can be seen from table 9.5, men from Ijoukak were certainly better informed on the involvement of the authorities in the project. Meetings relating to the project occurred in the commune of Ijoukak and the president of the cooperative interacted closely with the treasurer of the Cooperative, who also lived in Ijoukak. Information would therefore circulate between the treasurer and men of the commune. People in Ighir-Tazoughart also seemed well aware of this, which might be explained by the fact that one of the main middlemen trading in the valley lived in Ighir-Tazoughart, and was informed of all local transactions. By comparison, very few men knew of this in El Maghzen, even though the president of the cooperative lived there. However, women in El Maghzen and Ighir-Tazoughart seemed to be more informed about this than women in other villages. The president of the cooperative resident in El Maghzen would share this information with members of his family and this explains why many women were

informed in El Maghzen. The same applies to the women in Ighir-Tazoughart who were informed by women living in the same household as the middleman.

What is more, most people were aware that the men in the village associations had collected money towards the Cooperative. In all these villages, men were angry and complained that they had given money towards the project but had heard or received nothing in return. People even recalled the governor's visit during the opening ceremony. It follows that most people in Tagdite, Mejjou, Tenfit, Ighir-Tazoughart, Tijrichte, Tarbat, El Maghzen and Ijoukak did not know how the local authorities were involved or simply thought that the authorities did nothing (figures 9.11 and 9.12). People overall took the view that the authorities did not even venture into the valley.

Table 9.5: Percentage female responses to questions concerning local authority involvement in the distillation project between June and November 2007 and between January and March 2008

	Ijoukak	Tarbat	El Maghzen	Tenfit	Tijrichte	Ighir-Tazoughart	Mejjou	Tagdite
Commune contributed money towards the distillation building	6%	X	10%	X	X	10%	X	9%
Men contributed financially	X	10%	X	X	13%	19%	X	X
The authorities should support us	4%	X	21%	X	X	X	X	15%
Project does not work, people obey the authorities	X	X	2%	X	7%	5%	X	X

X= no responses volunteered in this category

Table 9.6: Percentage male responses to questions concerning local authority involvement in the distillation project between June and November 2007 and between January and March 2008

	Ijoukak	Tarbat	El Maghzen	Tenfit	Tijrichte	Ighir-Tazoughart	Mejjou	Tagdite
Commune contributed money towards the distillation building	32%	10%	6%	X	X	15%	X	5%
Men contributed financially	X	20%	X	29%	5%	17%	X	5%
The authorities should support us	6%	15%	24%	X	X	X	X	26%
Project does not work, people obey the authorities	X	15%	6%	X	10%	5%	7%	X

X= no responses volunteered in this category

Fig 9.11: Responses of women in the Agoundis valley survey to the question: What do the local authorities do to support the project?

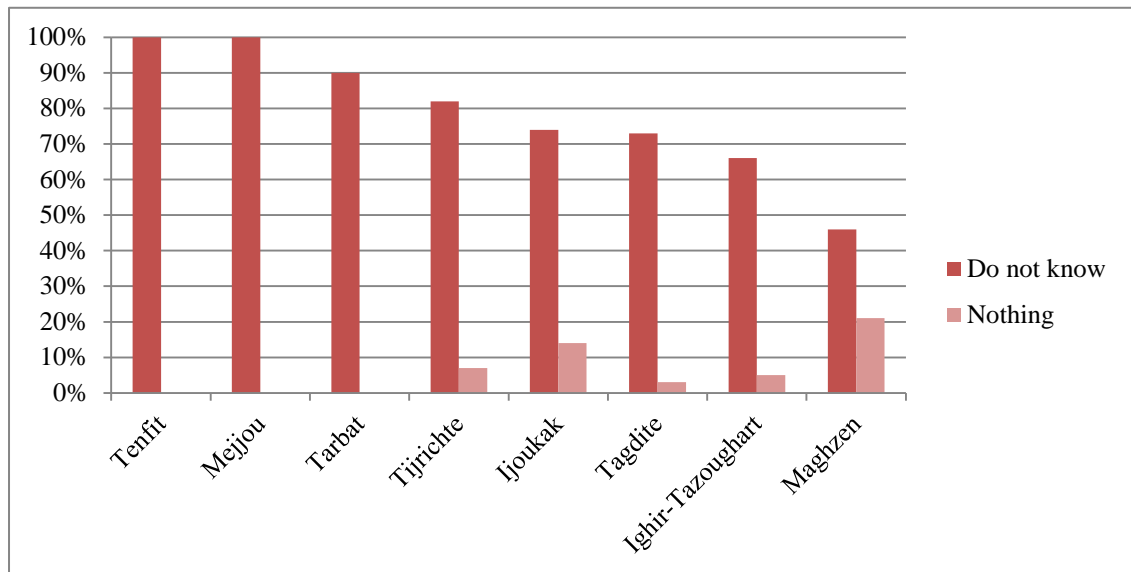
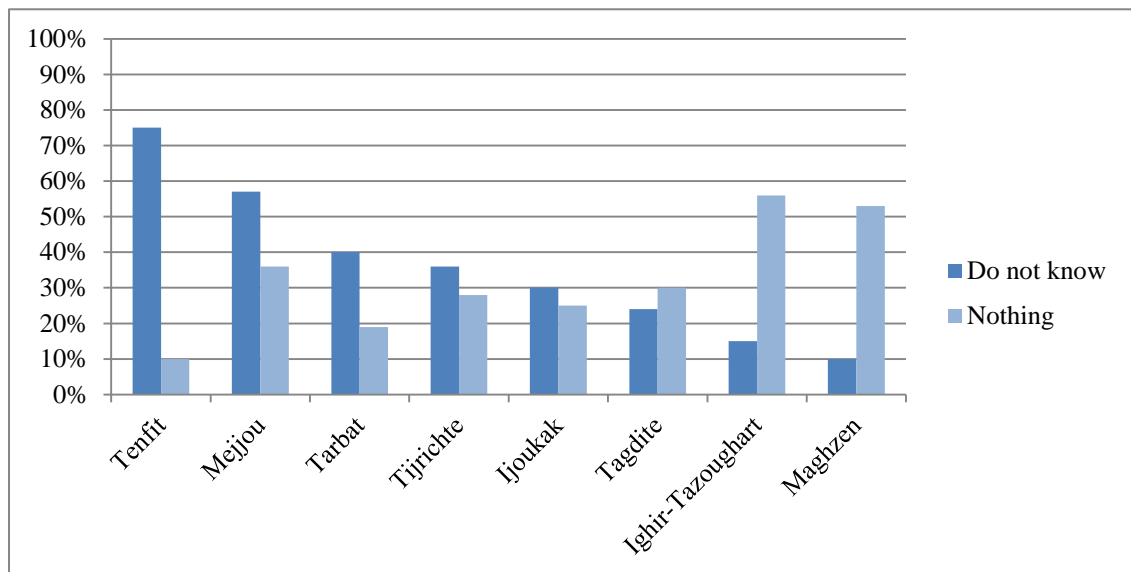


Fig 9.12: Responses of men in the Agoundis valley survey to the question: What do the local authorities do to support the project?



A few men from El Maghzen indicated that they did not expect anything from the local authorities. They stated that the authorities would not bring anything to the valley but rather that the project would. They further suggested that the local authorities should intervene materially and morally. In Tagdite, women complained that a few officials had previously visited them on a few occasions, promised various projects and initiatives, and that no action had followed. They further reported that they could not hold a meeting without the authorities' permission. In Ijoukak, women criticized the authorities, saying that they had promised and failed to supply animals and adequate water distribution to everyone and that the commune did nothing to help the local communities. In El Maghzen and in Mejjou, women claimed that the authorities should help them to create other work opportunities and work with people with more honesty. Women noted that the thyme harvest was only for a short period of eight weeks and questioned the role and involvement of the authorities in the project. They thought that the authorities should give more support by giving money or getting involved so that the project could move forward quickly. In general, people found the lack of initiative irksome.

Men in Ighir-Tazoughart complained that while they regularly enquired at the commune about both the project and the promised electricity supply, the authorities responded negatively. The vice-president of Tagdite's association complained that whenever they wanted to attend meetings at the commune with the commune president and the *khalifa*, the authorities would exclude them. Further, people had been told that the people of Maghzen as well as those people from the eight village associations would get 10% from the benefits of the distillation project. People were frustrated about this and emphasised that when money was available people would cash it in. Overall, the associations thought that the project was not working and that people were simply obeying the authorities and their political superiors. Ijoukak commune had promised that they would help most villages. Ironically, some people from Ighir-Tazoughart believed that the people from El Maghzen and the Department of Water and Forestry were responsible for the project, and some men in Mejjou thought 'they were all thieves'.

9.8 Local perceptions of village leadership

In order to assess the viability of the distillation project, it was necessary, in addition to examining local perceptions of wider authority structures, to assess perceptions of local village leadership. In this, the aim was to identify individuals who had shown a keen interest in participating in the distillation project or who had triggered incentives and were likely to influence the course of action for implementing the project. It was thought that this would reveal those likely to take directives at the village level.

Most people thought that they were working hard for the project (tables 9.7, 9.8), by which they meant that they were collecting thyme for the Cooperative as opposed to selling it to the middlemen. Many considered the Cooperative to be an important lever for economic development in the valley. These figures are higher for both men and women in El Maghzen than for any other villages because El Maghzen was the focus point of the project and people generally felt more motivated and realistic about the development occurring in the village.

In Tagdite, the president and members of the association expressed strong doubts that they were included in the project at all and manifested their frustration towards the president of the Cooperative and the commune. When conducting interviews with people about local leadership, the subject of money was frequently raised. People were angry because they had given quite large sums as requested by the president of the Cooperative and had not heard anything since the money had been given in the summer of 2006. They had contributed twice towards the Cooperative, the first time when they were requested to buy shares towards the creation of the structure and the second time, when the commune of Ijoukak asked the villagers to contribute towards harvest insurance. Not only were they asked for money a second time but were also put under pressure to pay, by threatening that otherwise they would not be allowed to harvest. They were further pressurised to sell to the Cooperative by the Cooperative treasurer which enabled him to realise a one dirham profit for each kilogram of thyme sold.

Some people thought that the middlemen were doing something for the project. They had indeed contributed quite large sums of money for the Cooperative and showed a keen interest. Some of them lived in the villages and had a very lucrative business through thyme harvesting. With the new directives, a contract had to be signed between members of the Cooperative and the middlemen for thyme collection. On average, each of the four interviewed middlemen said that they collected between 25 and 30 tons of

thyme during a good harvesting season and between 15 and 17 tons when the thyme was not so abundant. Each seemed to be making a profit of two dirham per kilogram when selling on to the bigger wholesaler. The merchandise is taken by the wholesalers to distillation factories in Casablanca. However, their role is not limited to the transport of merchandise. Middlemen play a significant role in the community by, for example, making cash advances to villagers or giving them credit when buying goods from the local village shop. Further, after the thyme harvest, they facilitate the financial transactions of villagers who have to get their harvest collected from their home rather than having to transport it to the *souk* on the public truck. Although they did not seem to have any particular information regarding the political situation pertaining to the project, their point of view was that the project was good for everyone, as it would allow people to work and earn a living. Three of the interviewed middlemen had ambitions and hoped to be able to develop other business ventures such as real estate, and selling door and windows. These middlemen further indicated that they would be prepared to sell thyme to the project to increase their income. One older middleman informed me that he thought that the project was not working and that he might consider bringing his thyme to the Cooperative once it had become operational.

When asking people if the village associations were trying to do something for the project, many recognised that the presidents and vice-presidents and men within the village associations had regular meetings, actively discussing the project as well as other internal village affairs. The presidents of associations who were also members of the Cooperative had also been attending meetings in the commune of Ijoukak. Although they were eager to take initiatives at the village level, they were not allowed to do so and had to request permission from the local authorities to hold meetings. However, away from the restrictions imposed by the local authorities, members of associations did cooperate. I witnessed this when trucks brought back the harvested thyme from the higher villages to El Maghzen in June 2008 under the *caid's* strict order that thyme should go to the Cooperative. The association presidents and members of the nearby village of Tenfit and Tijrichte kept a close check on the movement, and storage of the thyme.

An action much appreciated at the time was the gift of a plot of land for construction of the distillation project building by a local family in return for a percentage from oil distillation. Initially, a private land owner from El Maghzen agreed to lend a building in need of renovation for the storage of the alembic for a period of

five years. This was in agreement with the commune committee of Ijoukak, the village association and CDRT in 2005. However, the people from the higher villages of Tagdite and Mejjou did not only contest the choice of El Maghzen for the installation of the alembic, but also the rent of the building from a private landlord. Nor did they want the Department of Water and Forestry to allocate the land. What people had in mind in the long-term was for the Cooperative to be able to buy and own a plot of land. However, as problems persisted between the landlord and the villagers, the initial agreement with the private landlord was broken and the associations were faced with the problem of finding another suitable plot of land for the construction of a building.

Considering the central role of the Cooperative president in the community, he did not seem to be very much appreciated. He had a duty to communicate all relevant information to other members of the Cooperative and to ensure the enrolment process within the local population. However, interaction and communication seemed to be concentrated around the president and the treasurer of the Cooperative, and the president of the commune. All decisions and financial transactions were similarly concentrated.

Many people throughout the villages did not know of anyone in particular who was actively supporting the project beside the president and vice-president of village associations. Some women and men from Tijrichte mentioned that no one informed them of anything. Men and women in El Maghzen stated that the previous president of Ijoukak commune had contributed a lot to the communities. People questioned the role of the actual president for the project and other development perspectives such as the electricity installation and the road works programme that did not occur. Men and women in Tagdite, Tenfit, Ighir-Tazoughart, Tijrichte and Ijoukak reiterated the fact that they had given some money towards the project and had yet to see a return on this. People mentioned that the project had become a financial trap in which a handful of local people used the money to their personal advantage. In El Maghzen, some people thought that the Department of Water and Forestry and the commune of Ijoukak were responsible for the project and that its success would depend on them. In Tagdite, some men thought that I was directly involved in the project.

Table 9.7: Percentage female responses to the question: Who is working hard to implement the project in the valley?

Villages	El Maghzen	Tagidte	Mejjou	Tenfit	Ighir-Tazoughart	Tijrichte	Tarbat	Ijoukak
We work collecting thyme for the project	54%	6%	X	25%	X	X	X	X
Middlemen have contributed money	X	X	8%	X	X	X	X	X
President and vice president of the association	8%	20%	40%	33%	43%	31%	63%	43%
President of Cooperative	2%	X	X	X	X	X	X	6%
Do not know of anyone in particular who supports the project	36%	74%	52%	42%	57%	69%	37%	51%

X= no responses volunteered in this category

Table 9.8: Percentage male responses to the question: Who is working hard to implement the project in the valley?

Villages	El Maghzen	Tagidte	Mejjou	Tenfit	Ighir-Tazoughart	Tijrichte	Tarbat	Ijoukak
We work collecting thyme for the project	45%	10%	7%	15%	X	5%	10%	X
Middlemen have contributed money	X	X	7%	X	X	X	X	4%
President and vice president of the association	24%	29%	45%	45%	49%	49%	40%	76%
President of Cooperative	9%	X	X	X	10%	5%	X	4%
Do not know of anyone in particular who supports the project	22%	61%	41%	40%	41%	41%	50%	20%

X= no responses volunteered in this category

9.9 Communication problems

Communicating information regarding the various stages of project implementation was always going to be vital if the distillation project was to succeed and geographical non-proximity to the main sources of information in the Agoundis valley proved to be a problem. Communication required real effort on the part of key project actors and motivation to regularly visit and consult the population in their own homes. Few people besides the NGO staff made this effort. However, considering that the project was planned with the active participation of the local population, it was surprising that people were so rarely informed. The Cooperative's prime goal was to ensure that all villagers involved in harvesting thyme, and who had paid a membership fee, were informed and actively involved in the decision-making process. This role should have been assumed by the president. Being the first one to be informed of the initiatives for the implementation of the project, he had the responsibility to communicate this information to individual association presidents, who in turn would pass it on to all members during village association meetings. Through this top-down process, members would eventually communicate with other non-members until the whole population was reached.

It seemed important to find out the means by which people had been informed. In El Maghzen, the focus of the project, there were high levels of knowledge. These data were collected between June and November 2007 and again between January and March 2008. Most interviews occurred in the villages concerned with the project in 2007. In 2008, I revisited some villages with the aim of conducting interviews with informants who were not available during my first visit. As events occurred throughout the period of the implementation of the project, people had generally lost interest and for this particular reason, it was therefore highly unlikely that knowledge of the technical aspect of the distillation project would have increased. The building works were going on from spring 2007 to early 2009 and people were accustomed to seeing project activity when going to the mountains, to the gardens or to other villages. By comparison, while many people in the villages of Tagdite, Mejjou Ighir-Tazoughart knew about the project, in Tagdite 12% of women and 4% of men did not know, in Mejjou 14% of women did not and in Ighir-Tazoughart, 8% of women and 5% of men did not seem to know. Geographic proximity to El Maghzen was an important factor determining knowledge of the project. For this reason, it was not surprising that all adults in Tenfit, Tijrichte and Tarbat, knew about the project.

The means by which information about the project circulated were quite different for women and men. As women tend to be less mobile than men, and generally more confined to the village and household, most women in the villages of Tagdite, Mejjou, Tenfit, Ighir-Tazoughart, Tijrichte, Tarbat and Ijoukak knew of the project only because they had heard about it at second hand. In Tarbat, women told other women about the project while thyme harvesting and while I was conducting interviews with them. Many women also found out from the president and from the men of the village associations (Tagdite and Ijoukak). The men of El Maghzen told women in Mejjou and many women were told by their husbands. In Ijoukak, the Cooperative secretary and her mother told the women while enrolling them on the project. Many women had not seen evidence of the project for themselves. On the other hand, many women from Mejjou, Tenfit and Tarbat attended the opening ceremony (figure 9.15). Although much further away, 4% of women from Tagdite and Ijoukak, and 17% of women from Ighir-Tazoughart attended the ceremony. On the other hand, only 24% of women from Tijrichte attended despite its close proximity. Some women had seen the building work (10% of women in Mejjou, 13% women from Tijrichte) when travelling to the *souk* on the truck. The project had been publicised in the media and therefore some women learned about it from television. In Ijoukak however, 6% of women did not know anything about the project.

Most men who knew of the project in the villages of Tagdite, Mejjou, Ighir-Tazoughart, Tijrichte, Tarbat and Ijoukak, heard about it by word of mouth. The men from Tagdite were informed by the president of the village association and by the men of El Maghzen. These also informed men in Mejjou, Tijrichte, and Tarbat. The Cooperative secretary had informed some men in Ighir-Tazoughart. In addition, men overall tend to be more mobile than women and are more likely to be travelling up and down the valley on the truck. Men go down weekly to the *souk*, or attend to other business matters or travel to Marrakech and elsewhere. There are many opportunities for information exchange on these occasions. Therefore, a lot of men from Tagdite, Mejjou, Ighir-Tazoughart, Tijrichte, Tarbat and certainly from El Maghzen had seen for themselves the project or the building work. By comparison, only 4% of men from Ijoukak had actually seen the project because they had to travel up the valley. However, very few men from out-lying villages went to the opening ceremony: 14% of men in Tagdite, 15% in Tenfit, 5 % from Tijrichte and 8 % in Ijoukak (figure 9.16). Men who were members of the Cooperative obviously knew about it (7% in Mejjou, 13% in

Tenfit, 10% in Ighir-Tazoughart, 15% in Tijrichte, 8% in Tarbat and 36% in Ijoukak) and some from Ijoukak had been encouraged to contribute money towards the cooperative even though they were not members. Only 4% of men in Ijoukak did not seem to know about the project.

Fig 9.13: Percentage of women in different villages indicating that they knew about the distillation project: Agoundis valley survey, June-November 2007 and January-March 2008

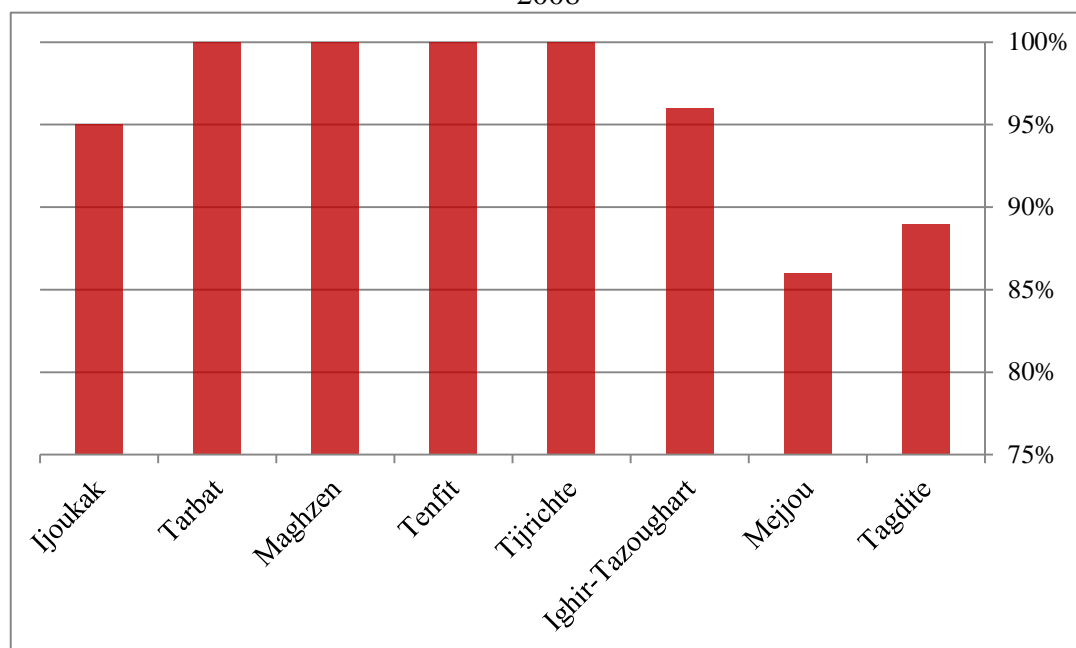


Fig 9.14: Percentage of men in different villages indicating that they knew about the distillation project: Agoundis valley survey, June-November 2007 and January-March 2008

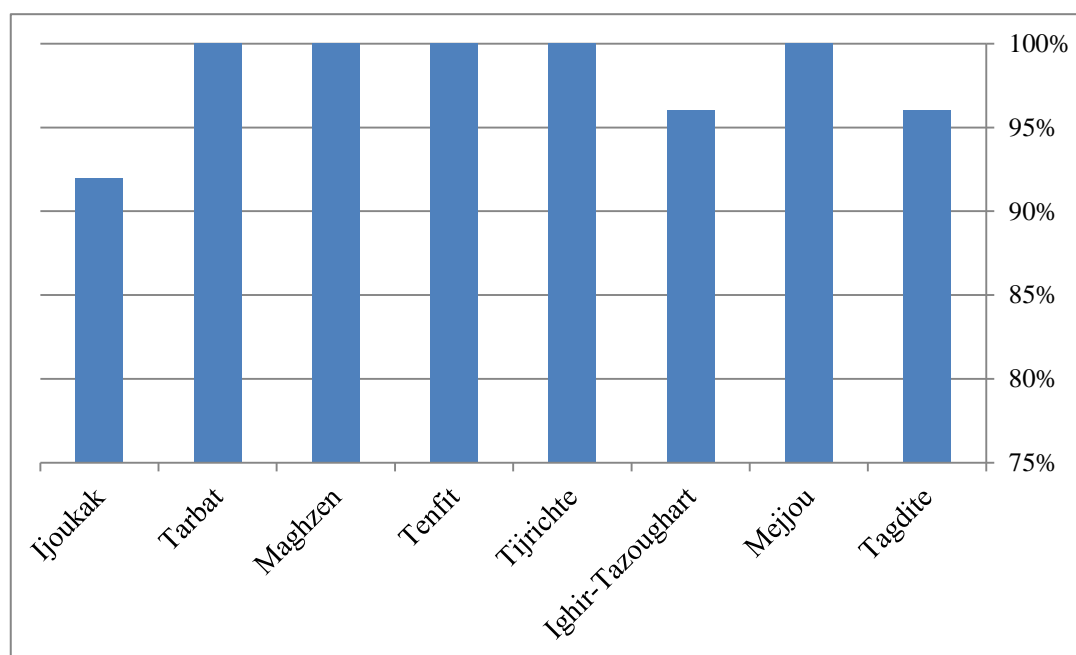


Fig 9.15: How women in different villages in the Agoundis valley survey learned about the distillation project

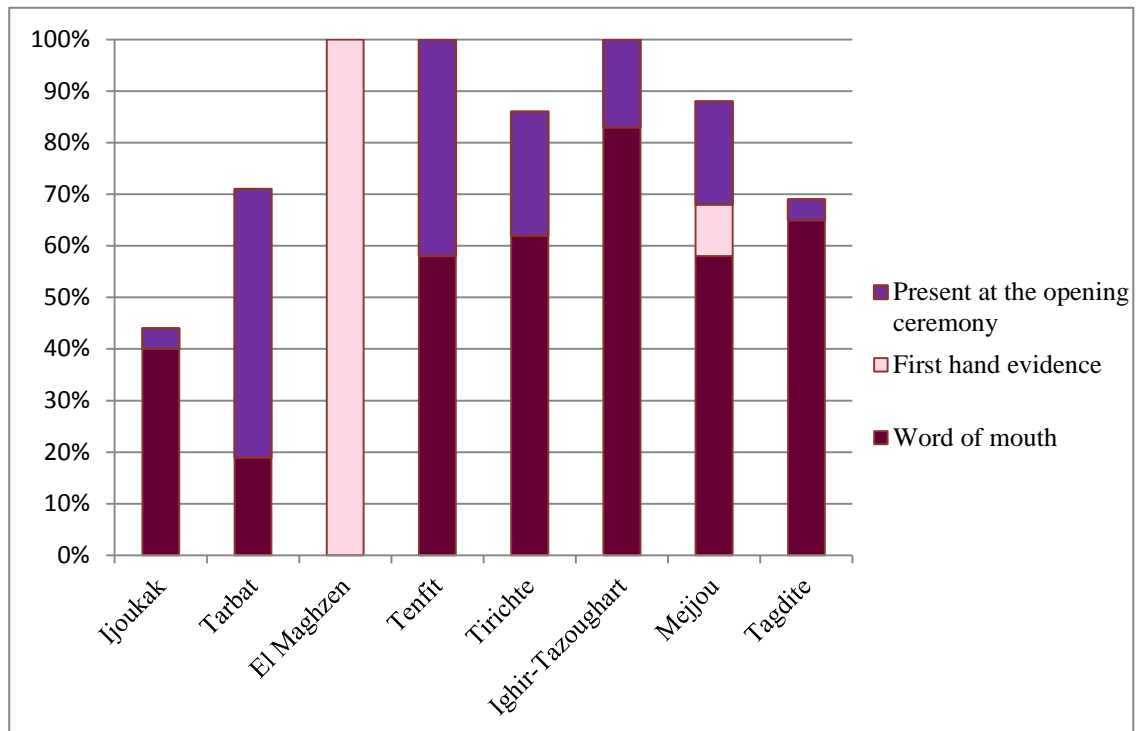
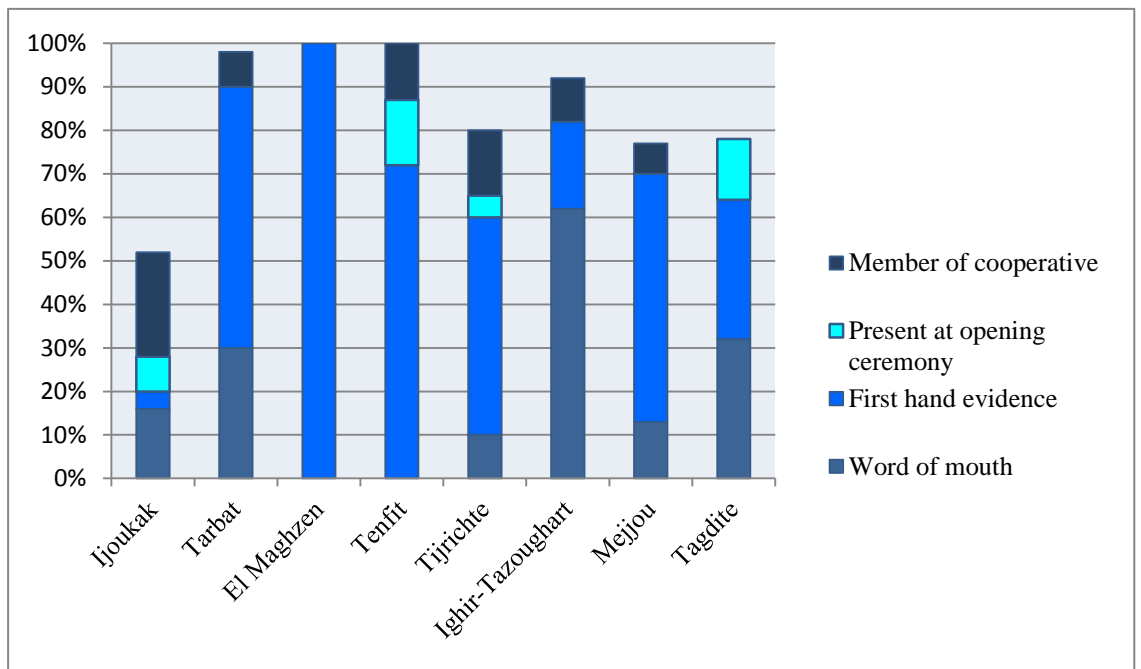


Fig 9.16: How men in different villages in the Agoundis valley learned about the distillation project



9.10 Local knowledge of thyme oil distillation

The active participation of the local population in any development project depends upon the successful transfer of technical knowledge. In the Agoundis valley, I found a major difference between local knowledge of thyme harvesting and that of thyme oil distillation in relation to its transfer. In all villages, people knew that the middlemen transported thyme mainly to Marrakech, and from there to distillation units in Casablanca. This is because people maintain close connections with the middlemen and because there is a direct interaction between buyer and seller. Beyond this, knowledge was very variable.

Given the importance of thyme collection in the Agoundis valley, it seemed important to assess how much local people knew about the distillation of thyme and how this had been acquired. It was surprising, therefore, to learn that few people knew of the installation of the alembic in El Maghzen, given that this was the central focus of the project. Indeed, 76% of women and 50% of men in El Maghzen (figure 9.17) did not know how thyme was going to be processed, while 16% of women and 38% of men knew that oil was going to be extracted. This was only because they had witnessed or heard about the distillation that the NGO (CDRT) had undertaken during its initial ground work in the village. They also thought that oil was going for export abroad and 4% of women and 12% of men had heard that they were going to produce medicine.

In Tagdite (figure 9.18), one of the highest villages in the valley, 71% of women and 62% of men knew nothing of the thyme processing proposed, 14% of women and 13% of men thought that thyme would be used to make medicine, 6% of women and 15% of men thought that thyme oil was for export to France and Europe. Six percent of women and 10% of men had heard that they were going to make a lot of money. Other men thought that it had something to do with oil and that those responsible for the project were going to make a lot of money.

In Mejjou (figure 9.19), ignorance regarding the purpose of the alembic was even greater, with 96% of women and 60% of men not knowing anything about it, 19% of men thought that they were going to make a lot of money, 21% of men had heard that oil was going for export abroad. Most villagers were told that those responsible for the project would become wealthy. The local stonemason who was working on the construction of the building for the alembic also informed some people. People from Mejjou contested the construction of the building and the alembic in El Maghzen, because they wanted their village to be the central point.

Although Tenfit (figure 9.20) is very close to El Maghzen, 100% of women and 86% of men were not aware of the technical aspect of distillation. Fourteen percent of men were told by the president of the cooperative that they were going to make a lot of money. Equally, in the more isolated and ill-informed village of Ighir-Tazoughart (figure 9.21), 87% of women and 61% of men did not know about the distillation project, while 13% of women and 24% of men thought that it would be making medicine and only 15% of men had heard that it had something to do with thyme and oil.

In Tijrichte (figure 9.22), 19% of women and 55% of men knew that thyme essential oil would be distilled and that it probably would go for export abroad. This may be because the Cooperative's vice president who is a local herbalist lives in Tijrichte and extracts essential oils in Marrakech as part of his practice. However, 44% of women and 40% of men still did not know how thyme would be processed. Thirty seven percent of women and 5% of men thought that they would make some types of medicine, such as cough syrup and ointments for rheumatism. On the whole, people had only vaguely heard of the pharmaceutical industry.

In Tarbat (figure 9.23), situated between El Maghzen and Ijoukak, 46% of women and 40% of men did not know that thyme essential oil would be distilled, 40% of men had heard about some oil production, while 25% of women thought that it might produce medicine for colds and headaches. Twenty percent of men thought that they were going to sell thyme to the project, 19% of women thought of chemical products such as washing powders and sanitary products and 10% of perfume, soaps and cosmetics. Information was quite widely diffused in Tarbat as the president of the association, an educated man who lives mostly in Casablanca, visits the village regularly, and is very involved within the community. He has an active role recruiting the inhabitants to undertake street maintenance works, installing house water supplies, and arranging education for women.

In Ijoukak (figure 9.24), the diffusion of information was very poor especially among women. Only 8% of women and 52% of men knew of the extraction of oil and its potential export, 48% of women and 12% of men thought of making medicine, 44% of women and 36% of men did not know. This is surprising considering that the commune is at the heart of the administrative process and a central point for information exchange, and where meetings were regularly held with the cooperative members.

Fig 9.17: Percentage responses by men and women in El Maghzen to the question: What do you know about the technical purpose of the alembic?

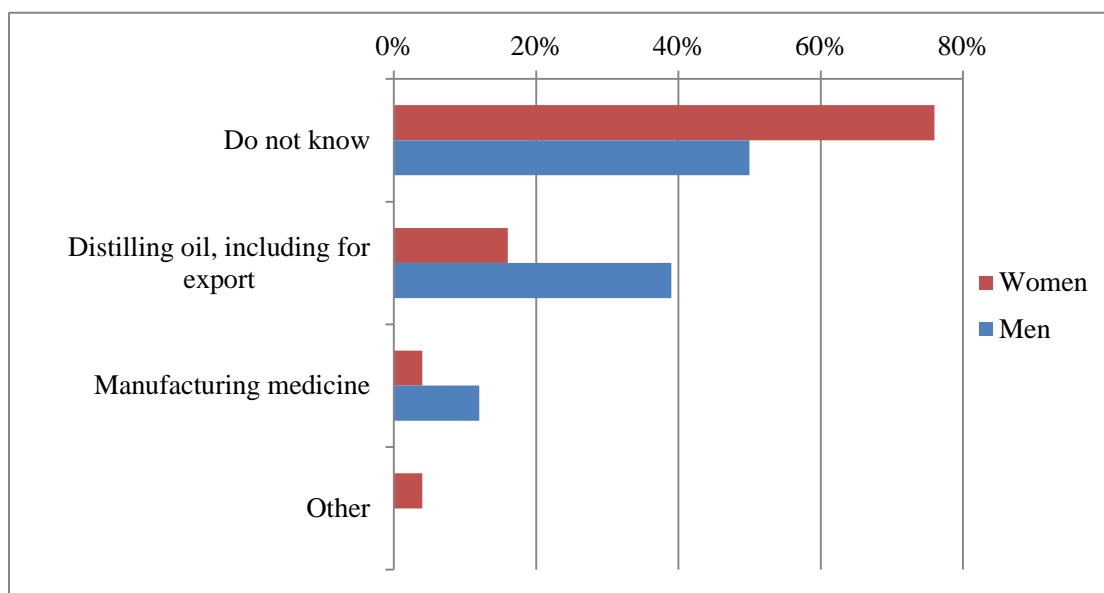


Fig 9.18: Percentage responses by men and women in Tagdite to the question: What do you know about the technical purpose of the alembic?

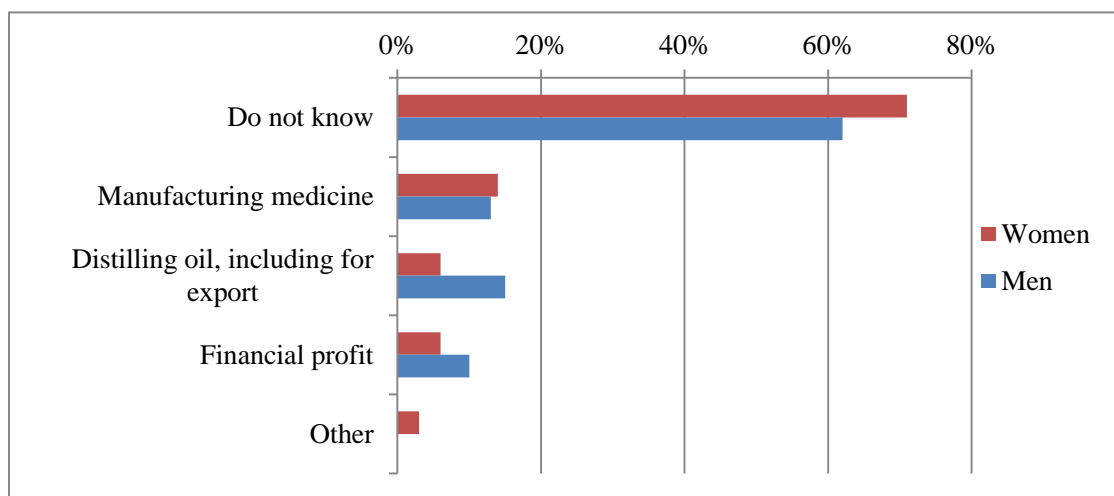


Fig 9.19: Percentage responses by men and women in Mejjou to the question: What do you know about the technical purpose of the alembic?

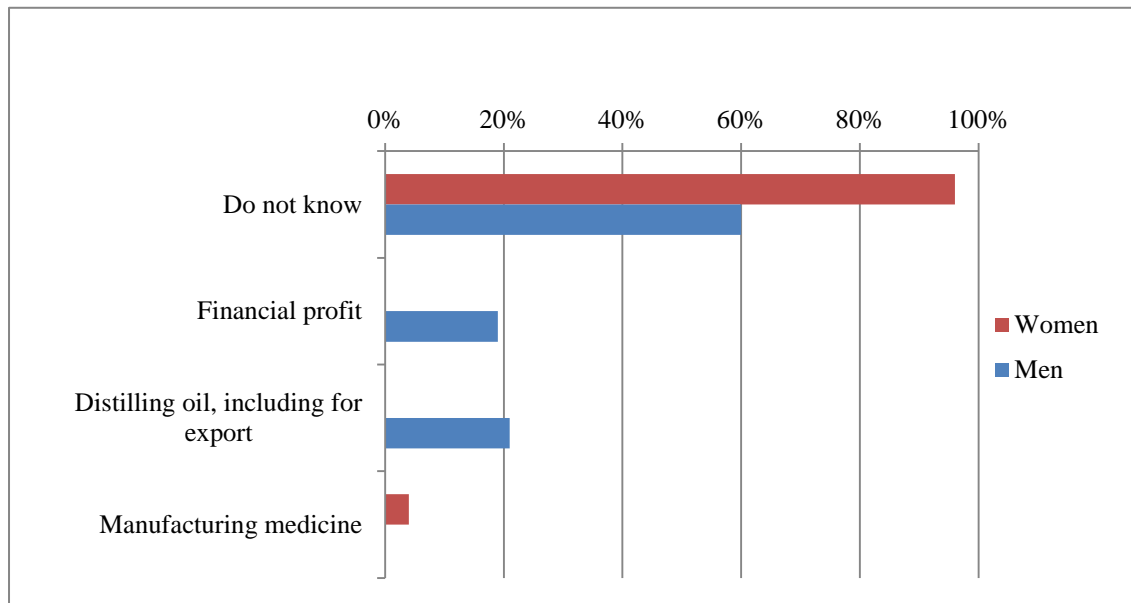


Fig 9.20: Percentage responses by men and women in Tenfit to the question: What do you know about the technical purpose of the alembic?

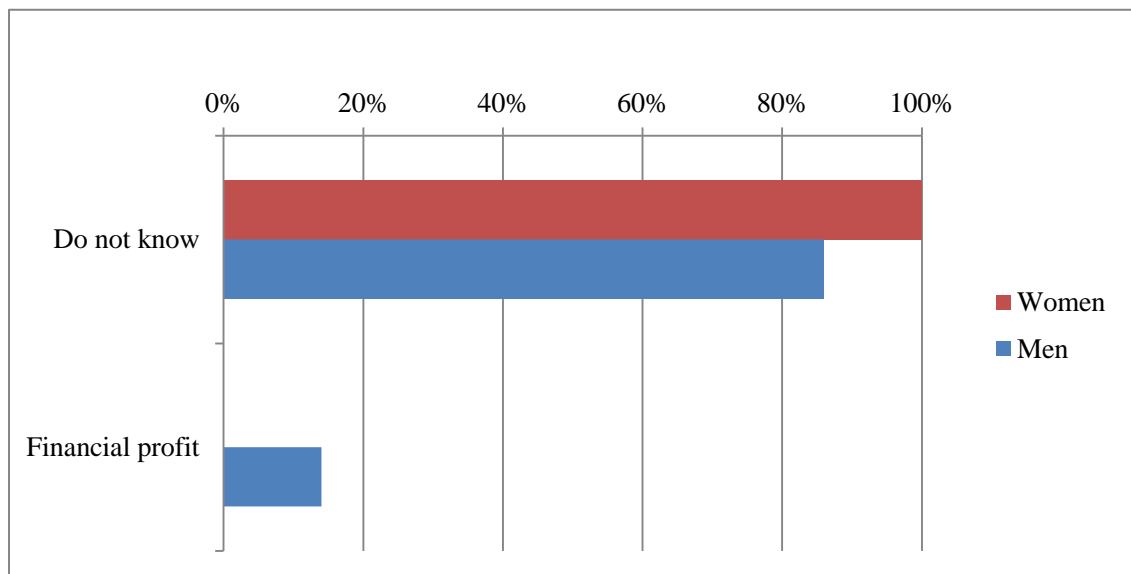


Fig 9.21: Percentage responses by men and women in Ighir-Tazoughart to the question: What do you know about the technical purpose of the alembic?

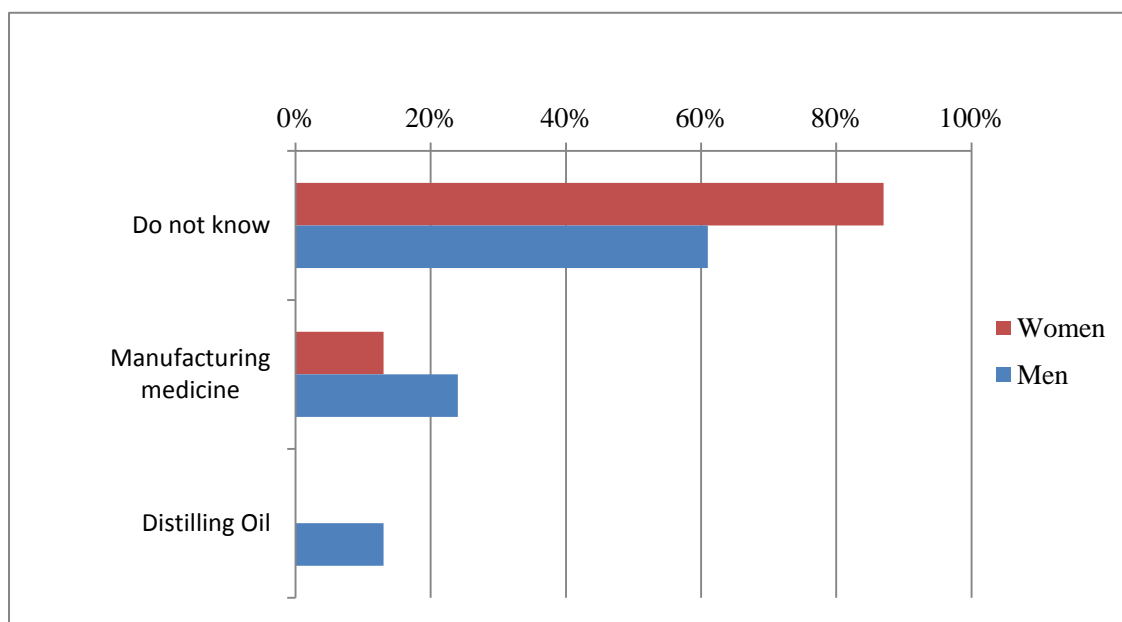


Fig 9.22: Percentage responses by men and women in Tijrichte to the question: What do you know about the technical purpose of the alembic?

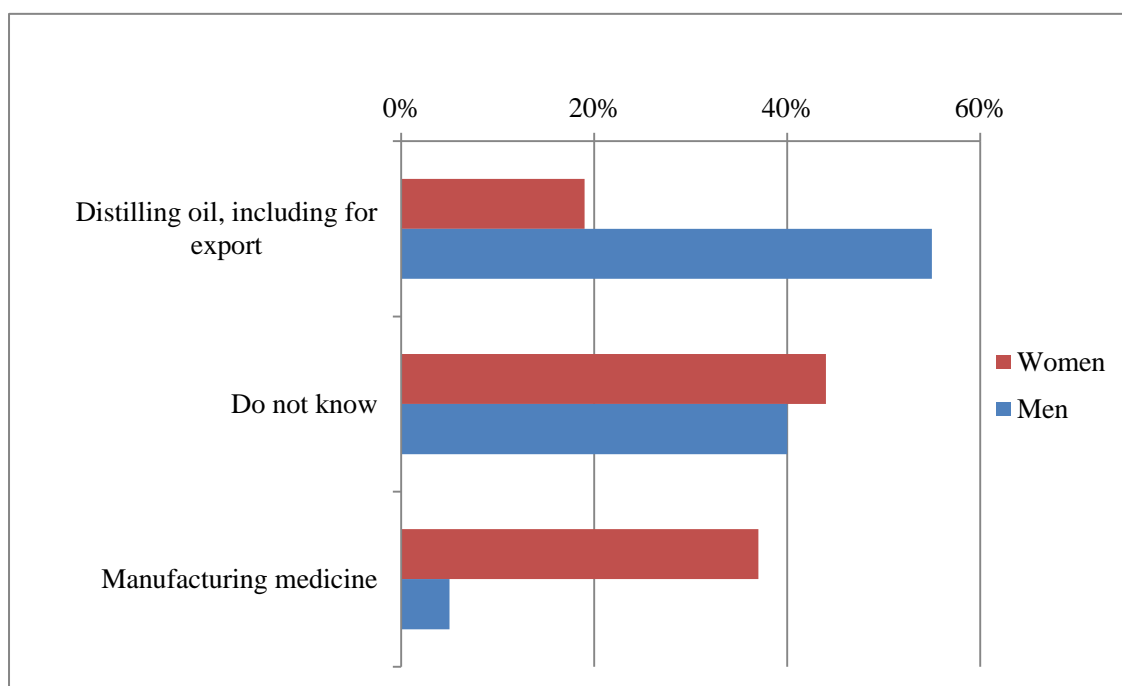


Fig 9.23: Percentage responses by men and women in Tarbat to the question: What do you know about the technical purpose of the alembic?

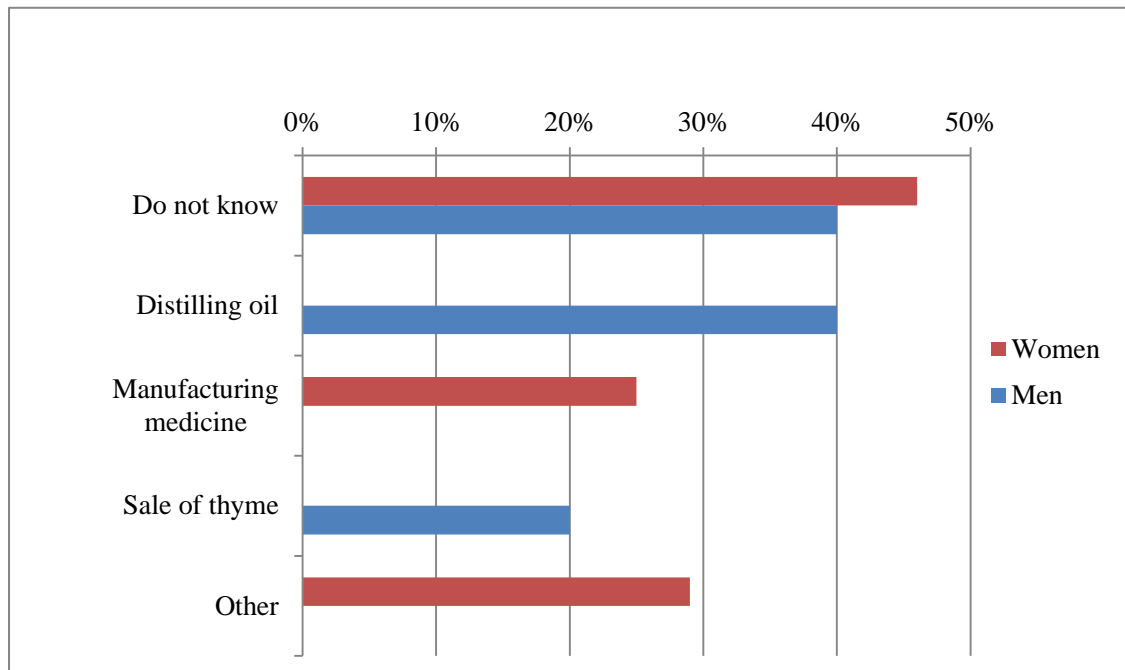
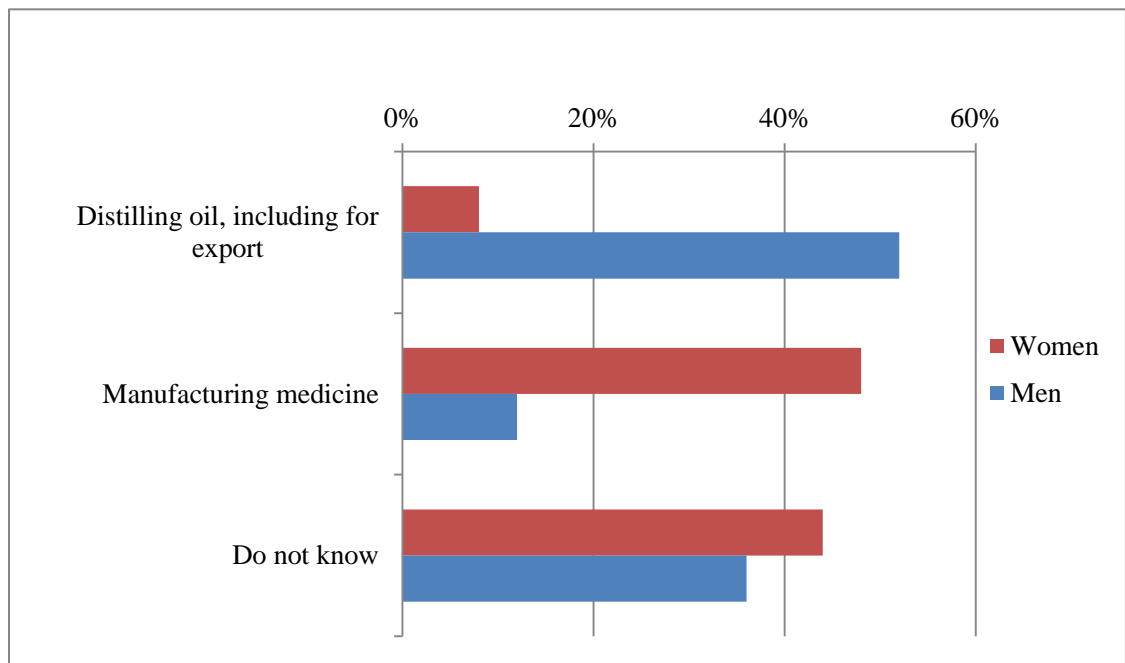


Fig 9.24: Percentage responses by men and women in Ijoukak to the question: What do you know about the technical purpose of the alembic?



9.11 Overall perception of the viability of the project

The desire for lifestyle improvement was evident throughout the Agoundis valley. However, people had a very realistic view of what was likely to influence the success of the distillation project. When I asked if they thought that the project would succeed, many people thought that the project would work. However, many villagers remained unsure or sceptical. By the end of 2008, there were still strong doubts expressed about whether the project would succeed (tables 9.5; 9.6). People emphasised that it could only be a success if people worked together, because as things stood there was a serious lack of communication. For many people, success would depend on the role of the authorities and on there being sufficient financial support. As indicated in tables 9.9 and 9.10, availability of thyme was considered by many to be a key to the success of the project.

Table 9.9: Attitudes of women in the Agoundis valley survey regarding the viability of the project.

Responses	El Maghzen	Tagdite	Mejjou	Tenfit	Ighir-Tazoughart	Tijrichte	Tarbat	Ijoukak
Hopeful	7%	3%	0	0	9%	3%	0	6%
Sceptical	55%	57%	88%	79%	61%	65%	73%	61%
Depends on the authorities	8%	10%	0	0	12%	0	10%	0
People disagree	16%	15%	0	0	13%	0	0	9%
Waiting to see	7%	10%	12%	0	5%	19%	0	21%
If there is thyme	7%	5%	0	21%	0	13%	17%	3%

Table 9.10: Attitudes of men in the Agoundis valley survey regarding the viability of the project

Responses	El Maghzen	Tagdite	Mejjou	Tenfit	Ighir-Tazoughart	Tijrichte	Tarbat	Ijoukak
Hopeful	6%	5%	0	0	0	5%	0	8%
Sceptical	44%	54%	77%	86%	67%	62%	60%	56%
Depends on the authorities	11%	10%	15%	14%	10%	0	20%	10%
Better if Moroccans do not manage project	10%	15%	0	0	0	0	0	7%
People disagree	14%	5%	8%	0	0	10%	0	8%
Waiting to see	12%	7%	0	0	13%	13%	10%	6%
If there is thyme	3%	4%	0	0	10%	10%	10%	5%

Some men in El Maghzen (10%), Tagdite (15%) and Ijoukak (7%) thought that the project would stand a better chance if the Moroccan authorities did not manage it. There was much uncertainty and disagreement, with little evidence of progress a year after the start of the project. Many were waiting to see if the project would succeed before committing themselves.

In this chapter, I have described the perceptions of the project at the village level. I have shown that provision of people's basic needs and the lack of infrastructure are important in the villages. I have also endeavoured to show that aspirations are numerous and varied amongst both women and men and the will to improve socio-economic conditions is prevalent throughout the valley. Although there was a strong interest in working on the project, people were sceptical regarding project implementation. This was consistently found throughout the valley. The inhabitants of the Agoundis valley are accustomed to broken promises. The population has clearly articulated their view of the local authorities' idleness and lethargy. There is a sense of scepticism and mistrust regarding any engagement with the local authorities to implement the project.

CHAPTER 10

Decentralisation, Local Knowledge and the Development of the Agoundis Valley Project

10.1 Introduction

In this chapter I return to the research questions set out in Chapter one. I originally sought to understand the Agoundis valley distillation project from the perspective of both the authorities and the local population, and to examine how their mutual engagement might influence implementation. While it is not within the scope of this chapter to undertake a full analysis of the Moroccan political system, it is important to take a wider view, particularly in relation to the government's reluctance to place political decentralisation at the heart of its reforms despite its stated intentions. Equally, to understand the feasibility of the project from a local perspective, it is vital to also take into account the physical and administrative remoteness of central power and authority. This final chapter points to key factors that have prevented the enterprise from developing at grassroots level. These include inadequate measures for involving the local communities as stakeholders, the issue of land access and the communities' lack of technical business knowledge to develop the enterprise. Overall, the case of the Agoundis valley project demonstrates that the approaches utilised by the government to involve local communities are incompatible with local needs and suggest that there is little desire to empower the local communities in the way that would be necessary to achieve effective economic development. The chapter also addresses the specific issues that the Agoundis valley distillation project give rise to in the context of wider discussions concerning the potential role of traditional knowledge and practices in promoting development at a grassroots level.

10.2 Decentralisation in Morocco

The case of the Agoundis valley project clearly reflects the complexities of applying decentralisation policies in a context of chronic poverty and isolated populations. It would have been easier if the central authorities had opted for political decentralisation (Chapter 2.6). However, this is not the case and the Moroccan central government has

instead deployed decentralised measures through an administrative structure. There are specific reasons why the country has not opted for political decentralisation. As described in Chapter 2.7, security and political stability issues are central for the Moroccan government. However, there are other internal pressures. These relate to social demands and expectations, rapid population growth and the threats posed by movements including the more radical Islamist groups, such as *Jama'at al-Adl wal Ihssane*²¹ (Madhi 2006). This is especially the case for the administration, public sector, military and security apparatus which have benefited most from the patronage system, and from segmentary competition within the elite. At the same time, these are the most obvious threats to the monarchy and render the monarch's task particularly difficult. Considering the necessity to maintain control over diverging forces within this fragile political environment, the commitment of the monarchy to open-up the country is perhaps not surprising. Caught between the will to develop Moroccan society according to a European model, and to fulfil international expectations for democracy in return for motivating economic incentives (Chapters 2.7; 8.2), the king has opted to comply with external demands but to retain ultimate control. His strategy of responding to the calls for a 'Western style' democracy has been facilitated by his educational background, political knowledge of EU-Maghreb relations and exposure to European culture. His education in public law and training in Brussels with Jacques Delors (then president of the European Commission) allowed him to gain considerable knowledge of democratic and financial mechanisms. He later acquired a PhD in EEC Maghreb-relations at the University of Nice (Medea 2009). By complying with external agencies' imperatives, the country benefits massively from external financial aid. These political manoeuvres have permitted the country to stand as an example for the rest of the Arab world. The kingdom is nonetheless still ruled by divine right, the centralisation of all state power in the palace has remained untouched, control remains with the state (*Mahkzen*) and its elites (Chapter 2.2), political stability remains fragile and the problems of inequality are not resolved.

²¹ *Jama'at al-Adl wal Ihssane* (Community of Justice and Spirituality). This Islamist group advocates principles of social justice, non-violence and activism in an orthodox Islamic context. Its role is to press for change in the Moroccan religious-political sphere (Madhi 2006).

Additional problems are the political reforms currently sweeping through the Arab world. Morocco has so far managed to avoid major civil disturbance. The challenge is indeed to maintain a balance between the calls for democracy and maintaining the existing class structure. The king has responded swiftly to the discontent by promising changes in the Moroccan constitution. Nevertheless, the current practices in relation to decentralisation present a whole array of contradictions, and reform is presently purely 'administrative'. The government has failed to tackle the long-standing issue of governance in the mountain areas in a way relevant to the peoples of the Agoundis valley, and at the level of palace politics, one local Berber project is of little concern to the wider Moroccan state agenda.

By bringing the state closer to the people, by increasing local participation and building upon social capital, decentralization promises to deliver democracy (Agrawal and Ribot 1999; Rondinelli et al. 1989; Dillinger 1994). While multiple international actors are involved in the process of attempting to deliver on this promise, they have not brought the expected results. International donor agencies may be concerned with issues such as citizen participation, poverty and hunger eradication, education and gender (Chapter 2), but the rate at which the policies are raised in a fast changing global scene to meet world political agendas cannot be sustained at the local level as originally intended. Consequently, the gaps between top-down directives and in situ implementation are numerous and significant. My research has shown, for instance, that although the INDH is well intentioned and active in the field of finding and funding projects, it cannot fulfill the needs encountered at the local level because these are not necessarily adequately mapped out (Chapters 8.3; 9.6). Because identification of urgent problems rests on 'so-called' decentralised local services' expertise in the identification and prioritisation of poverty issues, it requires the ability to convey an accurate image of the pressing issues and to remain neutral in terms of local politics. However, corruption at the commune level and the authorities' non-involvement is likely to handicap the identification of such issues. The INDH is a busy government organisation allocating funding, not a social welfare service. The allocated funding is managed as a bank loan that is accountable to donor agencies (Chapters 2.8; 8.2; 8.3). The institution, highly acclaimed on the Moroccan news media and praised for its action in achieving its

goals²², does not have the time or the human or political resources to check whether projects deliver the promised outcomes. Its role therefore stops at the opening ceremony. It applies what has been requested, e.g. the delivery of the government's political agenda. Consultants dropping in and out of programmes to evaluate their implementation assume this role.

10.3 The local authorities, the national park and the commune

Further difficulties encountered by the state in involving local populations in the development process can be seen in the lower echelons of the decentralized apparatus. International donors require participatory approaches as a condition of allocating funding and explicitly require consideration of the welfare and involvement of the rural community. The state must comply with programme objectives of poverty alleviation and gender balance (Chapter 8.2). In the Agoundis valley, local communities fit this model, and the Department of Water and Forestry is not excluded from these processes. Indeed, the Department is now compelled to include participatory approaches through the new directives. The Department of Water and Forestry and the officials who act directly under the *tutelle* of the Ministry of Interior do not have the capacity or motivation to do so. History has shown repeatedly that it is ill-equipped to approach the local communities (Chapters 3.7; 8.7).

As described in Chapter 3.5, the Toubkal National Park offers considerable capital in terms of natural and human resources. Its development is one of the government's top priorities for raising the output of forest products (Chapter 8.7). Furthermore, as the country has limited resources outside of agriculture, it currently relies heavily on tourism to achieve economic stability. Indeed, it has a long-term vision to develop the country as one of the top global touristic destinations by 2020, through sustainable development and socio-cultural authenticity (CNP 2010). Morocco's natural environment provides an ideal playground for tourists, and for its own urban populations and elites. Therefore, with the backing of institutional partners such as GTZ

²² In a purely statistical sense, Morocco has achieved one of the Millennium Goals: poverty reduction. The rural poverty rate has declined from 25 to 14 percent since 2000, while the proportion of the population living on less than \$1 per day has decreased to less than 1 percent, from 2 percent a decade ago (Achy 2010).

(Chapter 8.7), the development of tourism in Morocco's national parks, with local actors already set in place in the valleys, offers significant untapped sources of income towards this goal. The Park, therefore, has the potential to serve as an exemplary model of conservation consistent with the government's vision.

The case from Kerala in India illustrated by Heller (2006; 2008) and Veron (2001), and discussed in Chapter 2, demonstrates that un-promising local situations can be turned around. Because local municipalities became pro-active in decision-making and took responsibility for development expenditure, the accountability of elected officials and the bureaucracy was assured. This enhanced new forms of association and the meaningful participation of traditionally marginalized groups increased.

As argued in Chapter 2, there is enough evidence to show that the Moroccan government has been trying to engage with the local level without success, and I have shown that as part of the new decentralised policy, the commune has been assigned a crucial role in representing the populations' needs and priorities. So far, the applied measures that promised to reach the rural communities have failed. I have discussed in Chapter 9 the inadequate arrangements for consultation with the local communities, concerning their needs and indeed their knowledge of the distillation project. The Agoundis situation is comparable to the cases illustrated by Boujrourf (2004) and discussed in Chapter 1. The new measures cannot work because the rural commune has neither the financial resources nor the technical capacity to pursue development.

Although participatory approaches claim to narrow the gap between local government institutions and local populations, there is no fundamental difference between current and other attempts during the post independence era which have claimed to empower the local commune and earlier attempts during the Protectorate era discussed in Chapter 2. The measures applied then as now served a purpose: to limit the 'so-called' attributed powers. Because of the strong guardianship, nothing escapes control at the commune level. While busy sorting out small local affairs, ignoring illegal transactions in thyme for instance, the commune is left to its own devices, unable and ill-equipped to take on the responsibilities that it was 'assigned'. The commune is therefore a space where undisclosed transactions can be performed without any objection or having to account either to the province or to the local community. This perpetuates a cycle of unregulated internal transactions. Development kept at bay cannot occur as the room to manoeuvre is significantly reduced. This keeps the municipality level in limbo, preventing any movement arising from the grass roots level. The current

policies do not aim to empower the local level, as they do not give the commune the right tools to do so.

Lack of transparency and accountability goes some way to explain why this situation is perpetuated at the local level. Typically, elections (as discussed in Chapter 2) should deliver transparency. This mechanism, however, is not applicable in the Agoundis valley, even though candidates are elected by direct universal vote. Candidates are primarily motivated by the potential for self-enrichment, and staff remuneration is used to buy votes to win elections. We can, therefore, agree with Fisman and Gatti (2002) and Bergh (2009:346) that local communities have very few economic opportunities to become 'taxpayers' and to voice their right to demand accountability. A direct consequence is local community frustration regarding the authorities' attitudes and inaction and a sense of disenchantment and victimisation triggered by a corrupted non-functional system providing few initiatives and little information. This sentiment only reinforces the inability to hold councillors to account and ensures that participation in commune affairs is low. This arrangement under the 'decentralisation' scheme seems to have a disengaging effect vis à vis the local communities, ultimately maintaining the division between 'communities and authorities' in an already intimidating relationship. There is, therefore, no direct accountability to the local communities and transparency is nonexistent.

The project in the Agoundis valley emerged at a time that suited all institutional levels in the political hierarchy. It fitted perfectly with the national agenda for natural resource and economic development. It would have replicated successes evident from other isolated regions of Morocco, its success within the Toubkal National Park conservation policies would not only have boosted the image of the Park but also the government's good work in conservation and development. It would have vindicated the Department of Water and Forestry in its methodology for integrating local populations, in keeping with the new enterprise and partnership scheme proclaimed by the government. The INDH was launched by the government at about the same time that the project began in 2005 and its success would have bolstered the image of the initiative and satisfied the bureaucratic requirements of donor agencies. Further, successful implementation of the project at Ijoukak commune level would have strengthened those government policies promoting the commune as a key component of decentralization. For Ijoukak and its 'hidden' elite, a successful project would have represented a victory over Talat n'Yakoub commune, its main competitor. In the

political arena, as we saw in Chapter 8, all institutions have their own agenda and compete with each other. This results in lack of coordination, delays and ultimately conflict. The institutions' reputation, power and financial prosperity depend on fulfilling the organization's profile and agenda. This space, however, within and between the organisations, also becomes one in which to sort out personal differences related to power and political positioning. This holds the capacity to fragment or positively influence the outcome of designed projects. In the course of events, however, none of the authorities anticipated the high expectations local people would have of the project and the hope that it raised, and this contributed to the ensuing frustration. The problems of mountain communities are still low in terms of government priorities and the state has not resolved the integration of its isolated mountain regions. The dilemma is therefore re-emerging and maintains the division *Bled Al Siba* and *Mahkzen*. This situation may however favour a handful of elites who benefit from unseen local transactions to the detriment of the local populations (Chapter 5.8), while preserving law and order without too much dissent. As part of this order, mechanisms are set in place so that the authorities remain in control of the land and maintain the communities in economic isolation.

10.4 Development and economic organisation in the Agoundis valley

In Chapters 3 and 9, I have provided data on the living conditions in the Agoundis valley. The inhabitants, who previously had no comparable experience, could only perceive the project as a promising socio-economic advantage. For them, it was a unique opportunity to earn money, improve one's living conditions generally and fulfil aspirations, ambitions for themselves as well as for their children. To trigger initiatives in the context of poverty is difficult as the space for creativity and enterprise is largely reduced when people's priorities lie in area of daily subsistence.

While local people recognised that the rural commune had helped financially with the project and that this was INDH money, which had to transit via the local commune, and was delivered not without delays, they clearly expressed their general sense of resignation and disenchantment of the local authorities. The communities are well acquainted with the local authorities' unwillingness to contribute to initiatives and the disappointment is a direct consequence of the authorities misleading politics. Promises of change and reforms at the local level go back to the years of the Protectorate. Then as now, policies have been reshuffled in order to maintain authority

over the local level, preventing integration into the mainstream of economic development. The project raised a lot of hope; but the hope that the authorities would lift their strong-hold over the local population, has not materialised.

Despite the autarchic and political conditions that maintain the population in isolation, development is at bay and the communities are eager to be part of the economic process. Given the current socio-economic situation within villages, the political acquiescence of the population in the Agoundis valley, and the failed attempts to include the local level, the alternatives are few. The issues at stake here are about changing the paradigm to produce a dynamic local socio-economic development while the other is about remaining in a 'pseudo-development' phase that perpetuates the cycle of community stigmatisation, pressure on resources, builds up frustration leading to exacerbated hostility and assistance. While I do not think that enterprise will resolve all problems, I suggest that the communities have the capacity to move from a passive state to one of responsibility, confidence and economic contribution in a development process that emerges from below. The enterprise, then, would embody an innovative process where local knowledge is negotiated at the community level, to meet external opportunities that will ultimately and consequentially influence the course of development within and outside the community, opening up new ways for improving the welfare of the inhabitants rather than capitulating to top-down directives, that still seek to maintain the status quo (see Sillitoe 2006: 152-153, 170). However, because of the financial problems, and the corruption that are prevalent throughout the valley, horizontal transparency and accountability between members within the communities need to be established. In this, the local commune must become accountable for the communities' development initiatives to the higher authorities. This can be further implemented by independent audits and accountants who can make periodic checks. It would be helpful if the government could provide the means, to allow this to happen (see also Appendix 10 on policy implications and recommendations).

It is widely recognised that a community-based organisation stands a better chance of succeeding if it can draw upon the social dynamic and cultural forms of existing communities. The same model also requires that responsible key actors are able to take decisions and ensure community participation. I provided some examples of how this has worked in other parts of the world in Chapter 1.

A persuasive example of the unsuitability of participatory approaches that are 'designed' from above rather than which 'emerge' from below was the choice of the

president of the Cooperative. Although chosen for his *fellah* background (Chapter 8.2), this choice proved to be inadequate. This is not to say that the choice of a local figure to represent the community was not judicious. However, as seen in Chapter 8.9, selected actors become instrumental elements either for manipulative strategies or to serve the authorities' interests. Mountain environments present difficult and challenging issues in terms of governance. The 'governance' of these mountainous zones has been an issue for the Moroccan government throughout history, as we saw in Chapter 3. There is therefore no one model that fits all situations in terms of suitable approaches in this particular environment and for implementation to take place, governance can only be effective on the communities' own rules. Participatory approaches, then, have to embrace the community's customary rules, that will facilitate the establishment of local 'governance', allow people to get recognition, and involve the active participation of the community in the decision-making process, so as to influence external interventions (Sillitoe 2006:156). For instance, Benaboubou (2004c:34) has pointed out that knowledge of patrilineal organisation is essential from the perspective of undertaking development actions involving the population. This is important because it affects the way that conflicts can be resolved. Equally, the traditional *jama'a* cannot be disregarded because it is still important in the communities today. For instance, when choosing a suitable leader for the organisation of an initiative, the principle of the *ikhfaoun n'lajmaa't*, the brain of *lajmaa't* cannot be dismissed.

The choice of a leader has far-reaching consequences for community organisation and development. Because this status allows for decision-making on behalf of all (Chapter 3.10), it has the power to shape outcomes in either a positive or negative manner (Chapter 8.9). In practical terms, depending on the educational and intellectual capacity of the leading subject, it can lead to effective internal operations (as was the case of the cooperative secretary in initiating women's activities), and exert a great influence over the decision-making process more generally (Chapter 7.4). This role is vital given the level of misunderstanding concerning outside interventions throughout the valley (Chapter 9.11). This function has other significant implications beyond the boundaries of the community, for example in the absence of community recognition.

As was argued in Chapter 9, the communities currently lack the basic knowledge and experience for enterprise development (marketing strategies, administration, accountancy, business planning) and technical skills (post harvesting skills, product quality control and development, therapeutic effects, labelling). Infrastructure such as

roads, telephone networks, and means of accessing and communicating information, are major problems. This has prevented the effective circulation of information regarding the distillation project. However, this is not irreversible. This study has shown that the communities, though in some respects very different (in terms of situation, structure and size) can pull together when required. The informal connecting networks within and between the villages are important means by which information circulates. These networks compensate for the lack of information concerning technical aspect of the distillation project available through other means, for example through the authorities and the president of the Cooperative.

The perception of the authorities was that one should not expect more than the community's formal educational level might suggest, and that the ideal relationship between government and governed should be one of obedience (Chapter 8.5), and for this reason communities could not be expected to take initiatives. Chapter 8.8 demonstrates that responsible leadership is in fact present throughout the valley and that people are eager to work independently. The results further show that the associations' presidents were willing to take on directives, yet unable to act upon them (Chapter 9.8). Although inhibited, this suggests that initiatives can emerge at the village level, but face resistance from the institutional framework. This appears to be because project implementation is in the hands of decision-makers higher up the institutional pyramid, circumventing and frustrating active community participation (Chapters 9.7; 9.11; 9.25; 9.26). This is significant because the government claims a close partnership between the institutions and the local community and officially sees the role for the latter in decision-making. However, one may doubt whether the government's vested interests are served by community organisation emerging from below.

Education has a major role to play. Jutting et al. (2004) and Johnson (2001) have recognised that participation of the poor and the ability to participate in the political arena is unlikely in territories with a weak history of government accountability combined with low education levels. The Agoundis populations are already deprived of teaching the Tachelhit language, which could enhance the reconstruction of their identity. The current low education levels prevent the communities from engaging in political action and developing participation. While illiteracy programmes focus on the teaching of the *Koran*, its application in prayer and basic Arabic arithmetic, they do not address the populations' potential to develop initiatives and entrepreneurship. The current education programmes, therefore, cannot facilitate the awareness process and

stimulate creativity that external opportunities could compliment, nor do they encourage action.

A major challenge for the communities is to reinforce social cohesion in the face of external interventions. This study suggests that the communities are not presently encouraged to reconstruct community identity and confidence, nor to work towards political representation (Chapter 3.9). Rather, they have been subjected to a development discourse imposed through outside interventions (Sillitoe 2006:156). Only effective representation that can influence the development discourse in a way that serves their socio-economic interests can change this. The traditional *jama'a* and its moral authority within the community has therefore an important role to play in connecting traditional rules of natural resource management and the modern bureaucracy of the local commune, in a similar way to that anticipated by CDRT for the management of the natural resources through the Cooperative (Chapter 8.6). We might hope that the government would offer the possibility for this space to flourish so that collaboration with the authorities can occur on an equal footing. Only then, could the resulting enterprise allow the community to gain some socio-economic development and recognition. However, as I have described, it is unlikely that the government can provide the Cooperative with the opportunity to develop flexibly enterprise involving the community's own social rules, as it depends on employing the Cooperative as a work force under the auspices of the Toubkal National Park and the Department of Water and Forestry.

I have shown in Chapter 5 that the thyme trade at the present time is highly organised. One of the main objectives of the distillation project was to eliminate the role of existing middlemen and to ensure a more equitable distribution of the profits. CDRT had planned a community organisation to oversee the work, from harvesting to delivery of the final product. This has important implications since it has the potential to equip and strengthen the communities with knowledge of resource rights and benefit-sharing once products are commercialised and when faced with external buyers. As shown in figure 5.1, middlemen are numerous in the Agoundis valley, an indication that this lucrative trade offers many opportunities, an arrangement that benefits not only middlemen themselves but also officials. While the high number of middlemen contributes to the wide differential between the harvesters' remuneration and the retail prices paid by consumers in external markets, middlemen do have an important role to play within the community. Their intervention is crucial because the harvesters do not

have the financial capacity to transport the merchandise themselves. What is more, thyme collection occurs at home or within the village boundaries, even for the most isolated villages of the valley. This represents a major advantage for the villagers, as they do not have the human or financial means to bring the merchandise to the cooperative, especially in the most remote villages. Further, dealing with middlemen means that they have access to important information related to the trade. For the cooperative members, the middlemen provide vital external market connections, as well as credit. The intervention of numerous middlemen also introduces competitiveness between buyers of thyme, which is good for the harvesters. The possible way forward is therefore not to eradicate the current structure, but rather to change it so that the middlemen can better serve the interests of the distillation project. Open trade would bring increased accountability, another measure that the NGO anticipated with contracts between the middlemen and the cooperative. In practical terms, an alliance between harvesters and middlemen has the capacity to develop community organisation in the way already found in the informal 'illegal' thyme trade. The networks are in place and have the capacity to influence the course of initiatives and the decision-making process, and act in a cohesive manner to push matters forward, to coordinate within villages and ultimately transfer this to the Cooperative level. By fitting these elements together, the community has the potential to develop local initiatives, coordinate these between the villages to converge to achieve shared objectives.

10.5 Land access and natural resource management

Case studies demonstrating that land reform is a prerequisite for community involvement in natural resource management are numerous. However, as Palmer and Engel (2007) have emphasised, land agreements, ownership, and equity are often the main problems. Conflicts may arise regarding ownership and customary rights where land, forest and natural resources are claimed by the state (Yasmi et al. 2009). The Agoundis valley study has shown that a major hindrance to effective project execution has been the issue of land access (Chapter 8.7).

From the viewpoint of the various state authorities, it is the local population which has been responsible for natural resource degradation. The persistent stigmatisation by the local authorities of natural resource use by villagers is connected with the same authorities' non-recognition of traditional forms of resource management. For the communities these forms of management are part of their cultural heritage, and

attachment to the land and the services they render are strong. People do not accept the limitations and restrictions imposed by the external authorities and resent them for imposing them. The inhabitants of the Agoundis valley have always been self-sufficient. They have developed flexible mechanisms – terracing, irrigation, pasture management, transhumance, crop selection - that have allowed them to survive difficult (including extreme climatic) conditions using the resources at hand; villagers have adapted and shaped the landscape according to their needs.

Viewed from a community perspective, land access restrictions, fear of reprisals, the custody of the authorities and imposition of non-flexible rules are all factors that prevent cooperation between the authorities and the local communities. As stated above, the community's internal organisation centres on common property access and institutions such as the *tuiza* and *takatine* regulated by the traditional *jama'a* (Chapter 3.11). But although the authorities may formally control resource access and use, in practice this never happens. The Department of Water and Forestry's agenda does not match community priorities, while their presence and the way in which rules have been standardized contradicts customary social organisation. This prevents the Department from being fully incorporated within the purview of the community. Viewed from a community perspective, this perpetuation of outside control in turn feeds hostility between the community and the authorities. The authorities have stated that they would never go back to the traditional system. The issue of land restitution in the valley is intricately linked to the dominating exercise of central power over Berber identity and heritage. Recognition of customary law amounts to restoring birthright, and restoring birthright amounts to restoring identity. It conveys the persistent problem of the government's unwillingness to restore or compromise on customary law but is also associated with the exploitation of natural resources. Community involvement in the management of natural resources, however, is necessary if resources are to be properly managed. This requires that people are recognised as key expert holders of the local biodiversity knowledge, found in their direct environment (Sillitoe (2006:157). Unless the authorities can recognise the communities' central role, their interventions in the valley will be interpreted simply as disruptions of local social organisation.

The CDRT, it would seem, bypassed this problem with the creation of local commune-community-authority'committees. By assigning the Department of Water and Forestry the role of assisting and advising the communities with the technical aspect of resources that the population obviously lacks, it acknowledged the presence of the

institution not as a repressive agent but as a partner. By doing so, it aimed to maintain a balance between the community's own rules and those of the authorities (Chapter 8.6). Further, by giving the right to the communities to deal directly with the institution, it encouraged exchange on a more equal basis. The current policies are, however, unlikely to alter a long-standing deleterious relationship between the communities and authorities. Unless the local population's own rules and active participation in the decision-making process can be integrated in directives, trust cannot be restored.

10.6 Moving towards market integration

Although the communities of the Agoundis valley were positive about the thyme distillation project, building up an enterprise requires time. As I have noted above, the communities lack the basic knowledge, experience and skills necessary for enterprise development. Given the villagers' busy daily schedule, time management is essential and people prefer to organise themselves as a small 'cottage industry'. For the authorities, a successful project was expected to replicate the model used in other regions. For the communities, the project in the Agoundis valley was perceived as a unique opportunity to start trading and gain financial independence.

I have demonstrated in Chapter 5 how the results of the present study confirm that the thyme harvested in the Agoundis valley makes a significant contribution to the internal Moroccan herbal market. My results demonstrate also that there is potential for the communities benefitting further from this current trade and for contributing more to the local economy. The current imbalances in the trade are numerous and the inequalities between harvesters, wholesalers, manufacturers and retailers significant. If the price of thyme is determined by the relationship between demand and supply in a completely free market (Dhaka et al. 2009), the harvesters' current remuneration in the Agoundis valley is considerably suppressed (Tables 5.5; 5.6; 5.7). When analysing the market chain, the main beneficiaries can be seen to be the numerous middlemen who operate within the valley, retailers in the *souk* of Marrakech or the wholesalers who supply external companies. These in turn make a large profit by producing essential oil which is in turn sold to European or International companies. However, the herbal market supply is highly competitive in Morocco and middlemen compete to supply external markets, which forces down the price and leads to considerable fluctuation. Although these networks are crucial to meeting national and international demand, they could also contribute to the dynamic of the internal product development.

Given the organisation of the current illegal thyme trade, the communities in the Agoundis have the potential to keep product development within the valley. The work force is important in the valley and people are eager to earn incomes through increased thyme production. In Chapter 9, I have shown that in 2007 people generally supported the project, were ready to deliver thyme to the Cooperative in El Maghzen, and to start harvesting once capital was available. In Chapter 8, I showed how CDRT planned to encourage external business connections by stipulating in the cooperative articles the rights to sell to external agents. The community did this at a critical time when the money was needed to remunerate the harvesters in 2007, for which the authorities turned a blind eye. By granting the community the right to trade directly with external companies, to extract other natural resources and to negotiate directly with the Department of Water and Forestry, CDRT endeavoured to press for further community autonomy.

El Maghzen was chosen for the distillation project because of its accessibility. As I showed in Chapter 5, the herbal business is currently expanding. This is unlikely to diminish because of growing demand. National and international producers are eager to innovate in order to delineate themselves from other businesses in an increasingly competitive market. Consumers, on the other hand, are increasingly demanding fair trade products and major brands are responding to this demand (Renard 2005:419). There is also a growing demand for product safety, as well as for products that embody production values such as sustainable community development, education, health and environment improvement. External agents have been keen to get a plant supply from a source satisfying these criteria and even to provide financial support. Capitalising on these assets, encouraging ties, securing financial support, trade arrangements and joint ventures with external companies is important for community development, increasing financial stability and autonomy as well as entrepreneurial development. As was noted in Chapter 5, similar community projects have been successful elsewhere, for example in Madagascar, Namibia and India.

Ensuring sustainability, better monitoring and protection as well as payments for ecosystem services (for instance in return of community certification) is vital for community development (Gruère et al. 2006a). As discussed in Chapter 8, the Department of Water and Forestry has acquired firsthand the Fair Wild status through its top down directives. In principle, this should reflect the wild harvesting of the plant, the communities' awareness of plant sustainability, local endeavours towards its

conservation, and remuneration of the harvesters accordingly. In the Fair Wild scheme (Fair Wild Foundation 2009), the buyer pays the collectors and this usually entails a 5% mark-up. The principle is that fair harvesting status applies throughout the supply chain, until it reaches the final stage of product transformation, as is the case currently for thyme in the Agoundis valley. While the aim is to ensure that harvesters receive more income for their work, in reality, the scheme does not guarantee that sustainable practices will happen. For the people of the Agoundis, thyme harvesting is critical to the annual household economy, and they would never turn down additional remuneration, even though they are aware of the detrimental consequences of over-harvesting for conservation. Unless people are consulted and made fully aware and responsible for plant sustainability through support programmes, they are likely to continue cutting thyme the way that they have always done.

If the government were serious about plant sustainability and returning benefits to local populations, the Fair-Wild Premium Scheme would have been chosen instead. The Fair Wild Premium Scheme (Fair Wild Foundation 2009) is primarily designed for social development projects and ensures that, collectors and their organisations (in this case, the cooperative) receive the funding. All actors in the supply chain are remunerated for sustainable wild collection, the production and sales of final products, usually at 10% above the price normally paid to collectors, which women are encouraged to produce. Further, in the Fair Wild Premium scheme, independent audit necessitates evidence of money being used for the agreed objectives. The granting of this status to the communities through direct economic incentives not only encourages and promotes practices consistent with plant sustainability but also encourages accountability. This is also a major factor in attracting fair trade companies genuinely concerned and involved in social, ecological, and sustainable community development. This said, the Fair Wild Premium Scheme is not in the interests of the Department of Water and Forestry as it relies on a level of local community autonomy and direct accountability to an external partner that would undermine its own power. It further implies some responsibility towards resource sustainability, giving the community decision-making power in the management of resources. This is not part of the government's agenda.

However, the Agoundis valley project has the potential to achieve other objectives related to trade organisation as described in Chapter 5. The middlemen present throughout the valley provide the capacity to transport the crop readily from the

more remote villages to El Maghzen. My research confirms that selling the dried plant material is a significant economic asset for the harvesters. The drying process reduces considerably the plant volume, and thyme sold in the dried form is more lucrative than in the fresh form (tables 5.9 and 5.10). For the external markets, the quality of thyme bought dried often depends on the post harvesting method employed. Companies often spend considerable time and money cleaning the plant material to remove dust and debris if bought unclean (Montanari 2004). An advantage is therefore achieved in improving the post harvesting process, though this requires the right equipment. Further, dried thyme is kept in reserve to sell in times of shortage. This is a significant way for the harvesters in the Agoundis valley to add value and to increase their profit margins.

Moreover, my data confirm that the Agoundis valley abounds in natural resources that are already integrated into local knowledge systems. The potential of converting these into financial assets is high, benefitting not only the harvesters but also the local economy in general. The phyto-chemical constituents of thyme and lavender as described in Chapter 6, are a valuable asset for the essential oil market (tables 6.1 and 6.2), and this provides an opportunity to promote the marketing of other niche products on the basis of their ‘cultural authenticity’. While thyme and lavender oils are the key cash-earning products of the valley, there are also opportunities for the sale of other herbs, dried fruit and homemade products.

10.7 Traditional skills and modern enterprise

I have outlined in Chapter 7 some traditional skill sets that might be thought to have relevance for enterprise development. Whereas men’s skills tend to be confined to outside labour, women are engaged in a wider range of traditional activities across multiple and diverse domains, both within and outside the household. For this reason, their skills might be considered to offer more flexibility. Many of these are transferable skills, for example the culinary techniques involved in making homemade couscous and biscuits could be developed as money-making enterprises at a cottage-industry level. Another example is plant drying, where women tend to be the gatekeepers to plant knowledge and control post-harvest processing. Among male activities, olive processing, bee keeping and cultivation skills could be adapted for enterprise purposes.

I have found that villagers were highly motivated to take advantage of all development opportunities available. There was, as Tania Li (2007) puts it, ‘a will to

improve'. As I show in Chapter 9, all villages were eager to engage in entrepreneurial activities, to support the project and earn a living. In the traditional context, men are the external representatives of the household, dealing with external matters, including going to the weekly *souk* to buy groceries. The fact that women tend to be less mobile than men, and are confined to the village, limits their access to economic resources. Because of this, men preferred their wives to be able to earn a living within the village boundaries, a prospect largely appreciated by women themselves.

Female group cohesion facilitates the organisation of the enterprise. Women undertake many activities together and this underpins the coordination of activities. In the early stages of the distillation project (2007), the women in El Maghzen were organising themselves and working in rotating teams for the production of dried herbal mixtures, homemade couscous and biscuits. Nevertheless, as I have shown in Chapter 8, however strong the will is among women to work, they do not have the capacity or the incentive to initiate activities because they generally lack confidence. Any initiative requires the support of strong leadership and management. On the other hand, labour is readily available; there is group cohesion, organisation and the flexibility, all of which facilitates the integration of activities in the interests of enterprise. Generally, the more women there are in a household, the easier it becomes to integrate external activities.

Although the inhabitants of El Maghzen are strongly motivated to perpetuate their traditional knowledge base for good economic reasons, my research indicates that many practices including those relying on plant knowledge, are vulnerable because their transmission depends on women's work in key places, such as the household, the gardens and to some extent the mountainsides. As I have explained in Chapter 7, women are central to the maintenance of the household equilibrium, and other outdoor activities and the transmission of knowledge to the younger generation take place through these channels. As women become increasingly involved in the production of goods and increase their financial income, the pattern of traditional activities and the associated knowledge transmission is likely to change. We might anticipate that women will give up the activities that they perceive to be the most unrewarding within and outside the household.

An example of a traditional activity vulnerable to erosion is the collection of cow fodder. Given the choice, people would prefer to purchase hay at the *souk*. At present, the younger generation retains these skills and underlying knowledge, though this could

be jeopardised as household income increases and children are sent for further education outside the village.

A more serious concern is the transmission of herbal knowledge. The abundance of plant material available in a household is an indicator of the vitality of plant knowledge and associated use values. The more a plant is used for treatment, the more associated knowledge of the plant there will be. Because it is mostly women who collect plants, this activity is likely to diminish as women get more involved in other paid work, increase their cash incomes and favour convenient off-the-shelf allopathic medicines instead. Further, besides the plant collection that occurs for the purpose of providing plant medicine and cash exchange, plant knowledge is strongly linked to participation in traditional outdoor activities for both men and women. Within the household, fragmentation of traditional knowledge also occurs with the building of separate residences for newly-married couples. If the bride does not possess any plant knowledge at all, it is likely that she will not use plant medicines herself.

Guglielmino et al. (1995) and Eyssartier et al. (2008) point out that the conservative transmission of knowledge in a community allows the least room for innovation. This largely depends on the quality and quantity of knowledge held by each individual. At present, group cohesion is strong in the Agoundis Valley communities and much traditional knowledge is transmitted through these channels. However, this is vulnerable to change as people start earning money, and this in turn influences others, regardless of age (Chapters 7.8.1; 7.8.2).

This study further indicates that men's knowledge is as vulnerable as women's. Men acquire plant knowledge vertically through their parents and family and this occurs mainly in the context of activities that take place on the mountainsides. Men, depend more than women on family connections to acquire plant knowledge. It becomes evident that if members of the family become increasingly involved in the enterprise, or move away to work in the cities, they could lose the knowledge transmitted via this channel. Further, knowledge transmission within the younger generations is vulnerable as the younger members of the community tend to undertake many activities together and influence each other. This is how, for instance, building work came to be seen as the least favoured activity amongst younger members of the village. However, the erosion of male plant knowledge is potentially preventable because, as indicated in figure 7.11, thyme collection stands as the most preferred outdoor activity amongst

men. This also applies to female plant knowledge, as women mostly favour gardening activities.

One of the most positive outcomes of development activity in the Agoundis valley is likely to be the reduction of pressure on natural resources. Electricity has now been installed in most villages, and other infrastructures, such as roads, are likely to reach the villages in the near future. The valley, with its essential oil distillation, is likely to become a major tourist destination that will bring other economic opportunities. Therefore, as households generally increase their cash income by other means, it is likely that imported shop commodities will replace locally harvested products, thereby reducing the pressure on natural resources. This would apply to wood degradation and plant collection, particularly lavender, as widely collected as cow fodder.

10.8 Summary of findings

Decentralisation and community participation are said to be the twin pillars that contribute to successful natural resource management. Its success depends on applying a decentralised framework and the degree to which under-represented communities are permitted to enter this space. Whereas political decentralisation holds the potential for integrating communities through their involvement in decision-making processes, and thus contributing to community autonomy through empowerment, and better natural resource management, for the Moroccan government, decentralisation ultimately remains a means of retaining a kind of administrative control.

This thesis has challenged the underlying mechanisms for implementing an essential oil distillation project in the context of decentralisation in the High Atlas Mountains of Morocco. International funding agencies and policy makers have set the pace and designed programmes that address worldwide issues such as poverty, hunger, and natural resource conservation. These are in turn assigned to institutions, each having their own agenda for achieving the prescribed goals within a time frame that keeps up with the pace of changing world events. Programmes are then offered to developing countries that choose to comply or not with what seems to be most suitable arrangement given their internal political agenda. In Morocco, economic growth to secure the country against terrorism and the influence of radical Islamism is seen as paramount, and political positioning on the Arabic global scene has encouraged the government to open up the country.

By complying with International aid agency requirements, particularly with respect to policies on democratisation, poverty eradication, gender issues and natural resource conservation, the Moroccan government has massively benefitted from financial aid. This has permitted capitalisation of the national economy, and has kept the country relatively stable. The government's strategies have proved to be effective, especially in the face of the recent events (2011) sweeping across the Arab region- the so-called 'Arab Spring'. While the country has been compelled to address the problems relating to the designated programmes, such as poverty and natural resource conservation, the participatory approaches advocated by the government have not occurred and the policy designs have proved to be unsuitable at the local level. It is at the village level that government political choice of benefiting from International advantages without disrupting its central political agenda becomes most apparent. The issues at a community level remain unresolved and community' development along the lines envisaged non-existent.

The case of the Agoundis valley reflects the unsuitability of existing policies, and the government's determination to retain direct control over the High Atlas. Moroccan history, through past attempts by the government to decentralise to the local level, illustrates the repeated failure to devise appropriate development schemes. One of the main reasons jeopardising local socio-economic leverage at this level is the recurring problem of Berber ethnic recognition and the associated problem of land access. The Toubkal National Park, a high profile national asset, has to be maintained both on the national and international scene. It therefore seeks novel initiatives for the conservation of its natural resources. Given the economic incentives associated with issues related to biological diversity and the conservation of natural resources from international donor agencies, the restitution of land access for the communities does not permit the employment of the local population as a work force and would jeopardise these prospects. For the government, the distillation project in the Agoundis valley, had it been successful, would have been a model replicable in other regions, providing local employment and an improved means for maintaining the existing landscape, and for regulating the harvest of medicinal plants. However, as I have shown in this thesis, the government's policies have had the opposite effect on the communities, who continue to harvest plants in a way that runs the risk of over-extraction, as no alternatives are available to meet their subsistence needs.

Although the government has claimed to seek a close partnership with the local communities, this process is hindered by the national and regional political agenda. At the heart of the government's agenda for socio-economic development are the politics of Berber political representation. Berber ethnic communities do not have a political voice at the local level. Political decentralisation would address this imbalance, and the numerous problems that the rural communities face. In particular, a political decentralisation approach holds the potential to rebuild the deteriorated relationship between the rural communities and the local authorities, working towards a collaborative management, which in turn would contribute to regional economic development and conservation of natural resources. For the region to recover some form of economic prosperity, it is imperative that entrepreneurial development schemes be separated from politics. However, the current government agenda does not seek the conversion of communities as agents of development from below, but rather to preserve a status quo that perpetuates the over-exploitation of local natural resources and community isolation.

Paradoxically, at the village level, the distillation project was taken very seriously. In practical terms for restoring local economic vitality to the region, the communities possess significant assets to contribute to a reconstructive process, which could partly resolve the problem of poverty and social exclusion of the region. Local entrepreneurship represents an important aspect of this reconstruction. Developing small scale entrepreneurial units as well as promoting the distillation project would help to attain these goals. Enterprise, then, would not only become an objective but also a mechanism by which the community could achieve its broader social and economic goals (c.f. Nikolakis 2008).

The work force in the Agoundis valley is important and the local communities eager to participate in the economic development of the valley, on their own terms. What is more, the community possesses strong inherent organisational characteristics that, if properly channelled and managed would facilitate the process of socio-economic development. In particular, the 'brain of the *jama'a*' (see section 3.10 in Chapter 3) stands as a major feature of the traditional community that can provide a model for the kind of leadership required to respond to new community initiatives. Its successful integration, however, depends on finding suitable individuals who can pursue the common good. As I have shown, the lack of concrete participatory action has hampered

this process, in particular the failure of the authorities to understand the role that existing customary practices might play.

Given the demand for herbal medicine worldwide, the natural resources of the Agoundis valley represent valuable commodities. Thyme and lavender, already exploited by the local population, could contribute further to the growing essential oil market, the pharmaceutical industry and the public's increasing demand for ethical and fair trade products. Thyme distillation, as I have shown, could provide a model for developing other products from the valley. Other medicinal plants have the potential to be developed into 'cottage industry' quality herbal products as have some of the diverse traditional activities. Undertaken by women, these are important assets that not only would increase household revenues, but also contribute to the local economy if properly integrated and managed. What the population lacks at present are the skills to develop these valuable entrepreneurial tools into lucrative activities.

10.9 Contribution to the literature

The aim of this thesis has been to understand the mechanisms by which a 'participatory' essential oil distillation project in the High Atlas mountains of Morocco has been implemented in the context of government attempts at decentralization. The thesis has also examined the distillation project in the Agoundis valley in the context of policies to conserve natural resources within the Toubkal National Park. The research has challenged the directives prescribed by donor agencies and questions the new models of development which advocate poverty alleviation, and participatory approaches through the notion of 'decentralisation', 'democracy' and 'governance'. I have shown that decentralisation and the participatory approaches advocated by the Moroccan government, cannot deliver the socio-economic benefits promised to the people, nor can they enhance the management of natural resources. The political agenda, rather, serves other purposes that relate to macro development ideologies. Although project policies claimed to move away from a 'centralised' and 'top down' discourse towards a more flexible approach in planning, more often than not, project policies remained top-down, even though bottom up schemes were being increasingly advocated (Mosse 1997:17-19). The reasons behind these contradictions were the need to protect and guarantee some international interests, whether commercial or political, to satisfy the political agenda of Western agencies, and increasingly the issue of terrorism in the Maghreb. State-donor partnership programmes and preordained national poverty reduction

strategies are designed with financial incentives, administrative procedures, budget expenditures that guarantee their delivery (Mosse 1997:24; 2005:21, 23, 233, 234, 235). Against this background, decentralisation in Morocco could hardly be otherwise than administrative as important financial exchanges are at stake and the promulgation of political decentralisation would jeopardise these processes.

I have shown that the impacts of the policies applied by the Moroccan government, ironically in particular advocacy of ‘participatory approaches’ have failed to include local populations, or to provide concrete solutions to the poverty issues of the region. Moreover, these policies have created new inequalities within the communities, and isolated the populations even further. Because the policies were designed as part of programmes that also sought to retain state hegemony (Mosse 2005:4-5), the promises made by the central authorities could not be delivered to the local communities in the Agoundis valley. Rather, the state extended yet further its regulative and bureaucratic power with even greater control exercised over the marginalised and isolated communities. Relevant social, historical and political information about the communities, necessary for ensuring effective development was dismissed by the authorities, not because information was unavailable, but because it was inconsistent with the preservation of preferred models and protected interests (Mosse 2005:23-24).

I have shown that while the partner institutions and authorities claimed that the distillation project would address the issues of natural resources depletion, and for which the local communities were blamed, the local and cultural dimensions were largely dismissed (c.f. Sillitoe 2004; 2009). In the Agoundis valley, the management of the natural resources is a crucial component of local traditional knowledge that had sustained subsistence for centuries, and yet was dismissed. Thus, I have demonstrated in this thesis that villagers have managed agricultural, water and pasture resources, not only in a way that addresses appropriately the problems associated with living at high altitudes and limited space, but in a way that also buffers extreme climatic conditions through traditional customary law, the *jama'a*. Indeed, local knowledge, skills and capacities have been constantly shaped and reshaped, to respond to particular local problems and situations, in order to achieve and maintain specific survival objectives (Sillitoe 2004a; Sillitoe, Bicker and Pottier 2003:5, 230).

From the viewpoint of the authorities, the local population were responsible for the degradation of resources. However, the villagers were aware of their dependence on the resources for their subsistence. As an economic practice, thyme harvesting relies on

the same traditional skills traditionally sustained the resource. Thyme, as with other resources, is essential for the communities to ensure cash income. The traditional skills applied to the harvest of thyme have been modified to ensure the continuity of the resource on which economic subsistence depends. The way the villagers harvest, is not systemically unsustainable. Rather, the communities lack the technical skills to enhance its long-term sustainability and conservation, particularly in relation to a marginal natural environment. For the harvesters, a main indication that a change is occurring and likely to affect the availability of thyme is reflected in the lack of rain. They have witnessed this increasingly in the shortage of water and the associated problems for irrigating gardens and this confirms their suspicion that it may also be affecting thyme availability. This observation is based on a locality shaped by past and present experiences, and interpreted in relation to the physical and social environment. For the inhabitants of the Agoundis valley, the threat to thyme sustainability is perceived through changes in weather patterns that they cannot measure in technical terms.

The current trend in development practice is one where failed design policies succeed one another in an attempt to bring tailor-made solutions for the long-term improvement of communities in the socio-economic, health, agriculture and environmental realms. However, after so many failed attempts, there is an urgent need to find new alternatives to fulfil these goals. Such improvements may be achieved through interdisciplinary work, a hybridisation of knowledge, where technical and scientific skills are combined with traditional knowledge (Sillitoe 2004; 2009); Pottier, Bicker and Sillitoe 2003; Sillitoe and Bicker 2004; Sillitoe 2002; Sillitoe and Marzano 2009). I have shown that in the Agoundis valley, the successful implementation of the distillation project depends largely on the transfer of such technical and scientific skills to augment the numerous traditional practices that are readily available in the community. In the absence of government reforms, this can only contribute to the long-term conservation of plant resources and the socio-economic development of the valley. The case of the Agoundis valley defies the belief that community improvements solely depend on technocratic designs, but assertively supports the concept that traditional knowledge transferred to community entrepreneurship has a major role to play in improving and contributing to sustainable community development.

10.10 Postscript: my last visit to El Maghzen

My field research officially ended in 2009, but I visited El Maghzen again in May 2011. The village now has electricity and the essential oil distillation project has started. The president of the cooperative in El Maghzen is still the same person though it would now seem that various people from the village close to him have used their connections to get established within the organisation. As with the cooperative for aromatic and medicinal plants in Smimmou, Essouira (discussed in Chapter 8.7), where one family gained control of the project, the cooperative in El Maghzen seems now to be controlled by just a handful of local people headed by the president. There is a lot of hidden tension, as many villagers feel excluded.

Other problems that I found in 2011 relate to enterprise organisation, the cultivation of plants, and the control exerted by the authorities.

For instance, the herbal packaging does not carry the communities' own logo or a photograph of the Agoundis valley but rather a valley within the vicinity of the Toubkal National Park. The cooperative organisation is at present left to its own devices in relation to the technical aspects of the enterprise. There has been no follow-up and there are no educational programmes in place to instruct the local populations, in various management skills, product development, promotion and marketing, plant sustainability or community education. The essential oils are extracted on a small scale and sold through informal channels identified by the president and vice-president of the cooperative. Record-keeping is poor. The accounts are, therefore not transparent and transactions not traceable. While the oils extracted from thyme and lavender are of good quality and very potent, there are no therapeutic indications provided on the packaging. Considering the phyto-constituents of the oils and their potency, this is a serious health hazard that could cause much harm if the oils were to be taken internally without proper guidance.

The cooperative is now provided with young thyme plants cultivated by local men. These are destined for planting in gardens near the river. However, heavy rainfall in El Maghzen, has swept away not only half the mountain where the still is located but also the saffron that people had planted in the lower gardens next to the river. The problem now is finding the most suitable place for planting. The mountainsides would be the best option but this would not be a straightforward operation. Further, and assuming that these plants attain sufficient maturity for distillation purposes, the phyto-

chemical constituents will differ to those found in *Thymus satureioides* and *Lavandula dentata*.

From the land access point of view, and in relation to the extraction of thyme, the Department of Water and Forestry is back on the agenda. They have allocated permission to harvest 15 tons per year for the whole valley on an area of land covering 3200 hectares. This area is to be divided into two sections so that one can be used while the other is left to rest. However, 15 tons represents on average what a family harvests in a year in one village and the local population has been assigned a new role. They have now to watch over the land and act as guardians. Furthermore, they have to pay insurance to cover accidents that might occur during the harvest, and for fire hazard. It would seem that events have gone full circle. Needless to say, the mounting frustration is hard to contain among the cooperative members and villagers.

At the time of my visit in 2011, the villagers had yet to collect thyme for that year. They are supposed to cut and to bring thyme to the cooperative but were waiting for the 'go ahead' from the Department of Water and Forestry. Their revenues should also increase since the Department of Water and Forestry has opted for the Fair Wild status. This will undoubtedly encourage the illegal harvesting of thyme.

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Appendices

Appendix 1 Failed Previous Development Projects in the Atlas Mountains of Morocco

Year	Location	Conditions	Means / institutions	Outcomes
1961	Gharb Valley, Western Rif	Local erosion, flooding, local migration, improvement of road structures, health, education	International agencies and Moroccan government Restoration of local economy, Modification of land uses, Modernisation of agricultural techniques	Failed. Lack of coordination, at national (inter-ministerial) territorial administrations or local level. Incomprehension, hostility of local people. Gaps in initiatives, allocated budgets, and local implementation
1980	Ifrane, Middle Atlas	More efficient, improved production of land management, better quality herds, introduction of new animal foods through imported forage thereby protecting forestry heritage	International agencies and Moroccan government Limits to forest access to reduce overexploitation, Herds prohibited from using depleted areas, introduction of new techniques (tractors, seeds pesticides). Intensification of agriculture, Implementation of rotations	Failed. Lack of coordination at national (inter-ministerial) territorial administration or local level. Incomprehension, hostility of local people. Gaps in initiatives, allocated budgets, and local implementation
1985-1993	Tabant, Central High Atlas	Development of local employment, promotion of tourism in the region, training of mountain guides	Franco-Moroccan partnership / Network of structures with the inhabitants to welcome tourists on the strength of mountain treks	Failed as above.

Source: Boujrout 2004

Appendix 2

Common Medicinal Plants Found in the Agoundis Valley

Plate 2.1: *Lavandula multifida*
(El Maghzen, May 2007).



Plate 2.2: *Pistacia lenticus*
(El Maghzen, May 2007).



Plate 2.3: Tilirin (identification unavailable)
(El Maghzen, April 2008).



Plate 2.4: Mhrinza
(*Chenopodium ambrosioides*)
(El Maghzen, April 2008).



Plate 2.5: Tirka (*Globularia alypum*)
(El Maghzen, June 2008).



Plate 2.6: Timijja (*Mentha rotundifolia*)
(El Maghzen, June 2008).



Plate 2.7: Aknaria (*Opuntia megacantha*)
(El Maghzen, May 2008).



Plate 2.8: Capers-tylilout (*Capparis spinosa*)
(El Maghzen, June 2008).



Plate 2.9: Fig tree (*Ficus carica*)
(El Maghzen, June 2007).



Plate 2.10: Pomegranate (*Punica granatum*)
(El Maghzen, July 2008).



Plate 2.11: Soussban (*Iris germanica*)
(El Maghzen, June 2008).



Products from local plants

Plate 2.12: Lancert mixture
(El Maghzen, August 2007).



Plate 2.13: Rose buds sachets
(El Maghzen, July 2007).



Plate 2.14: *Lavandula dentata* herbal sachet
(El maghzen, July 2007).



Plate 2.15: Dried thyme sachets
(El Maghzen, July 2007).



Plate 2.16: Display of herb baskets
(El Maghzen, July 2007).



Plate 2.17: Sample of dried thyme and carob
(El Maghzen, July 2007).



Table 2.18: Drying Soussban roots
(El Maghzen, August 2007).



Plate 2.19: Drying walnuts
(El Maghzen, August 2008).



Plate 2.20: Drying almonds
(El Maghzen, June 2008).



Plate 2.21: Salty preparation of caper buds
(El Maghzen, September 2007).



Table 2.22: Drying figs
(El Maghzen, August 2008).



Photos: ©Bernadette Montanari

Appendix 3

Harvesting Thyme in El Maghzen

Plate 3.1; 3.1 (a): Harvesting thyme on Wijdane mountain (El Maghzen, June 2008).



Plate 3.2; 3.2 (a): Careful selection of the plants (Wijdane, June 2008).



Plate 3.3: Woody stems of thyme
(El Maghzen, June 2008).



Plate 3.4: Harvested thyme in flower
(El Maghzen, June 2008).



Plates 3.5; 3.5 (a): Piles of thyme drying on the cultivation terrace in El Maghzen
(June, 2008).



Plate 3.6: Separating thyme stems from leaves (El Maghzen, July 2008).



Plate 3.7: Turning over harvested thyme during drying (El Maghzen, July 2008).



Plate 3.8: Sieving thyme before packing (El Maghzen, July 2008).



Plate 3.9: Filling bags of thyme ready for sale (El Maghzen, July 2008).



Plate 3.10: Sack of dried *Salvia aucheri* (El Maghzen, July 2008).



Plate 3.11: Sack of *Salvia* ready for collection (El Maghzen, July 2008).



Plates 3.12: Bags of thyme ready for collection before loading on the truck in El Maghzen (July, 2008).



Photos: ©Bernadette Montanari

Appendix 4

Agricultural Practices in the Agoundis Valley

Plates 4.1 (a); 4.1 (b): Ancestral gardening practises (preparing the land for cultivation with cow manure as a natural fertiliser (El Maghzen, March 2007).



Plates 4.2 (a); 4.2 (b): Every space is used (El Maghzen, June 2007).



Plates 4.3 (a); 4.3 (b): Companion planting: (a) Corn (*Zea mays*) and pumpkin (*Cucurbita pepo*) and (b) tomato plants growing on reed frames with egg plant (*Solanum melongena*) (El Maghzen, July 2007).



Plates 4.4 (a,b,c,d): The architecture of gardening. (a) Reeds supporting tomato plants; (b) furrowed garden for irrigation; (c) onion plantation and (d) wheat (El Maghzen, June 2008).





Plate 4.5 (a) and (b): Modifying river flow with dams and sluices to improve garden irrigation (El Maghzen, March 2008).



Plate 4.6: Irrigation devices: (a) traditional use of soil/stone banking (*saqiya*) deriving its source from a Sultan spring (*ayn sultan*) (c.f. Geertz 1972) and (b) modern stone and cement conduct.



Photos: ©Bernadette Montanari

Appendix 5

Results of free listing exercise

Female				
Item	Number of reports	Reports as percentage of total number of respondents	Average Rank	Smith's salience
1 AZOUKNI	56	100	1.429	0.951
2 TIMZURIA	53	95	2.509	0.773
3 TIMIJA	44	79	4.523	0.495
4 AZOUKA	40	71	4.750	0.436
5 SHICH	34	61	5.971	0.312
6 MHRINZA	27	48	8.000	0.167
7 SALMIA M	27	48	7.111	0.211
8 IJOMRAR	24	43	6.292	0.223
9 FLIYYO	23	41	8.130	0.155
10 TIRKA	20	36	5.200	0.224
11 TILIRIN	19	34	6.211	0.156
12 IRGUEL	18	32	6.111	0.150
13 LERKAMT	17	30	9.176	0.109
14 LOUISA	15	27	10.133	0.093
15 SALMIA G	10	18	9.800	0.073
16 SHIBA	10	18	9.500	0.070
17 TAZOUKNIT	9	16	7.333	0.065
18 HERSSA	6	11	12.333	0.031
19 AORMI	5	9	8.000	0.037
20 IFZI	5	9	7.000	0.047
21 LATARSHA	4	7	12.750	0.020
22 TIGAYIN	4	7	10.000	0.027
23 TIRGUELT	4	7	4.500	0.038
24 IDZRI	4	7	5.000	0.050
25 BURDOUSH	3	5	15.333	0.018
26 TIMERNA	3	5	9.000	0.026
27 TAROUBI	3	5	13.667	0.010
28 TITKT	3	5	12.667	0.019
29 IZORAN	3	5	11.333	0.009
30 LOUZ	2	4	13.500	0.008
31 TAILIOUT	2	4	13.000	0.014
32 TIRKINOSRO	2	4	7.000	0.020
33 LARHBEZA	2	4	10.500	0.011
34 TIKIDA	2	4	19.000	0.008
35 GUERNOUNCH	2	4	7.000	0.020
36 AGDIGUE N	2	4	11.500	0.019
37 GUEZRIEL	2	4	11.500	0.009
38 TIBE	2	4	8.000	0.018
39 TIFIDAS	2	4	15.500	0.006
40 IZORAN NIDR	1	2	25.000	0.001
41 ALILI	1	2	7.000	0.006
42 TIMNRA	1	2	9.000	0.006
43 LRAOUR ENG	1	2	8.000	0.008
44 LIAZIR	1	2	7.000	0.010
45 AZATO NOUS	1	2	5.000	0.012
46 AGDIGUEROM	1	2	6.000	0.011
47 IMJA	1	2	4.000	0.010
48 ABRCHAD	1	2	13.000	0.001

49 IGG	1	2	14.000	0.009
50 ADERN TASE	1	2	6.000	0.014
51TIKT	1	2	17.000	0.007
52 LOUARD	1	2	5.000	0.008
53 TARKAYIN	1	2	13.000	0.008
54 AGDIGUE HA	1	2	20.000	0.005
55 ADEL	1	2	15.000	0.006
56 UQZERN	1	2	16.000	0.005
57 TADROT	1	2	18.000	0.003
58 TIRKMIN	1	2	19.000	0.003
59 AZIR	1	2	26.000	0.001
60 IFRAOUN ZIIT	1	2	11.000	0.009
61SHANOUSH	1	2	12.000	0.003
62IMZURIA	1	2	2.000	0.016
63TIFZYIN	1	2	10.000	0.011
64AGUERZURIEL	1	2	11.000	0.010
65 IZORAN TAS	1	2	3.000	0.015
66 NAFAA	1	2	13.000	0.001
67 IZORAN UDA	1	2	11.000	0.002
Total average	541	9.661		
Male				
Item	Number of reports	Reports as percentage of total number of respondents	Average Rank	Smith's salience
1 AZOUKNI	33	94	1.030	0.941
2 TIMZURIA	28	80	3.143	0.564
3 TIMIJA	25	71	6.000	0.344
4 SALMIA M	24	69	3.917	0.423
5 SHICH	19	54	4.000	0.336
6 AZOUKA	16	46	5.250	0.257
7 TIRKA	16	46	4.688	0.272
8 LERKAMT	15	43	7.533	0.153
9 IJOMRAR	12	34	6.833	0.109
10TAZOUKNIT	10	29	2.700	0.239
11FLIYYO	10	29	7.700	0.113
12 SHIBA	9	26	8.556	0.084
13 IRGUEL	9	26	6.778	0.104
14 SALMIA G	6	17	6.333	0.095
15 IFZI	5	14	7.000	0.052
16 LOUISA	5	14	9.000	0.038
17 MHRINZA	4	11	8.000	0.038
18 TILIRIN	3	9	9.000	0.023
19GUERNOUNCH	3	9	7.667	0.025
20 TIKT	3	9	8.667	0.027
21BURDOUSH	3	9	6.000	0.044
22LATARSHA	2	6	7.500	0.024
23TIRGUELT	2	6	10.000	0.018
24 ALILI	2	6	9.500	0.029
25TASEFT	2	6	8.500	0.028
26 TAZOUTA NO	1	3	9.000	0.008
27 IZRI	1	3	10.000	0.007
28 ZITUN IFR	1	3	7.000	0.015
29 TIMNRA	1	3	6.000	0.016
30 HERSSA	1	3	7.000	0.013
31TIRKINOSRO	1	3	8.000	0.010
32TAROUBI	1	3	4.000	0.024
33TIFZIYN	1	3	6.000	0.020

34 SAFRAN	1	3	6.000	0.013
35TAMAIT	1	3	8.000	0.017
36TICHKI	1	3	9.000	0.015
37ASSEL	1	3	10.000	0.013
38TESWICK	1	3	11.000	0.012
39 LOUZ	1	3	12.000	0.010
40HARMAN	1	3	13.000	0.008
41ADEL	1	3	14.000	0.007
42UQZERN	1	3	15.000	0.005
43KHOUKHE	1	3	16.000	0.003
44 MISHMASH	1	3	17.000	0.002
45 IZAIBI	1	3	4.000	0.018
46TIGAYIN	1	3	12.000	0.004
47 LIPSBESS	1	3	8.000	0.010
48MADNOUSS	1	3	9.000	0.008
49 TIKI	1	3	10.000	0.013
50TAILIOUT	1	3	11.000	0.012
51TAFLAYUT	1	3	15.000	0.005
52 AORMI	1	3	6.000	0.011
53IMZURIA	1	3	2.000	0.023
54 AIFS	1	3	4.000	0.014
55ZAATAR	1	3	2.000	0.025
56 DRO	1	3	3.000	0.021
57AZAR	1	3	5.000	0.014
58BERWAG	1	3	6.000	0.011
59TARFA	1	3	8.000	0.004
Total average	300	8.571		
Male and female combined	Number of reports	Reports as percentage of total number of respondents	Average Rank	Smith's salience
1 AZOUKNI	89	98	1.281	0.947
2TIMZURIA	81	89	2.728	0.693
3TIMIJA	69	76	5.058	0.437
4 AZOUKA	56	62	4.893	0.367
5 SHICH	53	58	5.264	0.321
6 SALMIA M	51	56	5.608	0.293
7IJOMRAR	36	40	6.472	0.179
8TIRKA	36	40	4.972	0.242
9 FLIYYO	33	36	8.000	0.139
10LERKAMT	32	35	8.406	0.126
11MHRINZA	31	34	8.000	0.117
12IRGUEL	27	30	6.333	0.133
13TILIRIN	22	24	6.591	0.105
14LOUISA	20	22	9.850	0.072
15TAZOUKNIT	19	21	4.895	0.132
16 SHIBA	19	21	9.053	0.075
17SALMIA G	16	18	8.500	0.081
18IFZI	10	11	7.000	0.049
19TIRGUEL	6	7	6.333	0.030
20BURDOUSH	6	7	10.667	0.028
21AORMI	6	7	7.667	0.027
22LATARSHA	6	7	11.000	0.021
23 HERSSA	5	7	11.167	0.023
24TIGAYIN	6	5	10.400	0.018
25GUERNOUNCH	5	5	7.400	0.022
26TAROUBI	4	4	11.250	0.015
27IDZRI	4	4	5.000	0.031

28TIKT	4	4	10.750	0.015
29TAILILOUT	3	3	12.333	0.013
30TIRKINOSRO	3	3	7.333	0.016
31TIMERNA	3	3	9.000	0.016
32 ALILI	3	3	8.667	0.015
33TITKT	3	3	12.667	0.012
34IZORAN	3	3	11.333	0.005
35LOUZ	3	3	13.000	0.009
36TASEFT	2	2	8.500	0.011
37TIMNRA	2	2	7.500	0.010
38LARHBEZA	2	2	10.500	0.007
39UQZERN	2	2	15.500	0.005
40AGDIGUE NOU	2	2	11.500	0.012
41 IMZURIA	2	2	2.000	0.019
42 ADEL	2	2	14.500	0.006
43TIKIDA	2	2	19.000	0.005
44 GUEZRIEL	2	2	11.500	0.005
45TIBE	2	2	8.000	0.011
46TIFIDAS	2	2	15.500	0.004
47 ASSEL	1	1	10.000	0.005
48KHOUKHE	1	1	16.000	0.001
49TIKI	1	1	10.000	0.005
50SAFRAN	1	1	6.000	0.005
51IZRI	1	1	10.000	0.003
52TICHKI	1	1	9.000	0.006
53MADNOUSS	1	1	9.000	0.003
54AIFS	1	1	4.000	0.005
55MISHMASH	1	1	17.000	0.001
56DRO	1	1	3.000	0.008
57AZAR	1	1	5.000	0.005
58ZITUN IFR	1	1	7.000	0.006
59TARFA	1	1	8.000	0.001
60IGG	1	1	14.000	0.005
61TESWICK	1	1	11.000	0.005
62AGDIGUE HAR	1	1	20.000	0.003
63 LIPSBESS	1	1	8.000	0.004
64 TAZOUTA NO	1	1	9.000	0.003
65 AZIR	1	1	26.000	0.000
66LIAZIR	1	1	7.000	0.006
67 HERSSA ELH	1	1	14.000	0.001
68IZAIBI	1	1	4.000	0.007
69BERWAG	1	1	6.000	0.004
70LOUARD	1	1	5.000	0.005
71 AZATO NOUS	1	1	5.000	0.008
72 AGDIGUE RO	1	1	6.000	0.007
73 LRAOUR ENG	1	1	8.000	0.005
74TAFLAYUT	1	1	15.000	0.002
75SHANOUSH	1	1	12.000	0.002
76 ABRCHAD	1	1	13.000	0.001
77 IMJA	1	1	4.000	0.006
78 ZAATAR	1	1	2.000	0.010
79TIFZIYN	1	1	6.000	0.008
80 ADERN TAS	1	1	6.000	0.008
81TAMAIT	1	1	8.000	0.006
82 IFRAOUN ZIIT	1	1	11.000	0.006
83TARKAYIN	1	1	13.000	0.005
84TADROT	1	1	18.000	0.002
85TIRKMIN	1	1	19.000	0.002
86 HARMAN	1	1	13.000	0.003
87IZORAN NID	1	1	25.000	0.001

88AGUERZURIEL	1	1	11.000	0.006
89 IZORAN TAS	1	1	3.000	0.009
90 NAFAA	1	1	13.000	0.001
91IZORAN UD	1	1	11.000	0.001
Average total	841	9.242		

Key: Frequency; respective percentage; average rank; Smith's salience

Appendix 6

Aromatic and Medicinal Plants of the Agoundis Valley

Latin name	English name	(A)Moroccan Arabic and (B) Berber names
<i>Atropa belladonna</i>	Deadly nightshade	(A) Bou rendjoub
<i>Atractylis gummifera</i>	Spindlewort	(A) Addad
<i>Aristolochia longa</i>	Snakeroot	(A) Burustum
<i>Artemisia arborescens</i>	Tree wormwood	(A) Shiba
<i>Artemisia herba alba</i>	Wormwood	(A) Shich
<i>Bryonia dioica jacq</i>	Sanke bryony	(A) Fashira
<i>Capparis spinosa</i>	Common Caper bush	Kabbar (A) and (B) Tylilout
<i>Cerotonia siliqua</i>	Carob tree	Kharroud (A) and (B) Tikidit
<i>Chamaerops humilis</i>	Dwarf palm	
<i>Chenopodium ambrosoides</i>	Worm seed	Natna (A) and (B) Mhrinza
<i>Cistus laurifolius</i>	Cistus	(B) Irguel
<i>Citrillus colocynthis</i>	Colocynth	(A) Handal
<i>Coriander sativum</i>	Coriander	(A) Kusbara
<i>Cucurbita pepo</i>	Pumpkin	(A) Qar'a
<i>Daphnea gnidium</i>	Spurge flax	(A) Lezzar
<i>Euphorbia echinus</i>	Cactoid Euphorbia	(A) Umm el Ibima
<i>Fraxinus auguatifolia.Valh</i>	Ash	(A) Dardar
<i>Foeniculum vulgare</i>	Fennel	(A) Besbas
<i>Ficus carica</i>	Common fig tree	Karm (A) and (B) Uckzern
<i>Globularia alypum</i>	Globularia	Shelpa (A) and (B) Tirka
<i>Iris germanica</i>	German Iris	Soussban (B) and (A) Azraq
<i>Isatis tinctoria</i>	Woad	
<i>Juncus maritimus</i>	Sea rush	(A) Samar
<i>Juglans regia</i>	Walnut	l-gerga (A) and (B) Tarkayin
<i>Laurea arboriscence</i>	Laureat arborescent	(A) Mmu-lbeyna
<i>Letharia vulpina</i>	Wolf lichen	
<i>Lavandula dentata</i>	French Lavender	(B) Timzuria
<i>Lavandula multifida</i>	Lavender	(A) Kohyala
<i>Lavandula stoechas</i>	Spanish Lavender	(B) Timerza
<i>Lippia citriodora</i>	Lemon vervein	(A) Iwiza
<i>Lonicera peniclymenum</i>	Honeysuckle	(A) Arifi

<i>Malva parviflora</i>	Mallow	(A) Khobbeiza
<i>Marrubium vulgare</i>	Common white horehound	Marriout (A), Ifzi (B)
<i>Mentha pulgemium</i>	Spearmint	(B) Fliyou
<i>Mentha rotundifolia</i>	Mint, round-leaved	(B) Timijja
<i>Mentha veridis</i>	Sweet mint	(A) Nana
<i>Morus alba</i>	White mulberry	(A) Tout
<i>Myrthus communis</i>	Myrtle	(A) Mersin
<i>Nasturium officinalis</i>	Watercress	(A) Qurrat El' Ayn
<i>Nerium oleander</i>	Oleander	(A) Defla
<i>Nigella sativa</i>	Black Cumin	(A) Kammun aswad
<i>Ocimum basilicum</i>	Sweet basil	(A) Habaq
<i>Ononis natrix</i>	Ononis	(A) Sabun la 'zara
<i>Oreganum majorana</i>	Sweet marjoram	(B) Mardaddoush
<i>Papaveras rboeas</i>	Corn poppy	(A) Ben na'aman
<i>Petroselum sativum</i>	Parsley	(A) Madnouss
<i>Pinus halepensis</i> Miller	Aleppo pine	(A) Senouber
<i>Pistacia lentiscus</i>	Lentisk	(B) Derw
<i>Portulaca oleracea</i>	Purslane	(A) Rashad
<i>Prunus malus</i>	Apple	(A) Teffah
<i>Punica granatum</i>	Pomegranate	(A) Romman
<i>Quercus ilex</i>	Green oak	(A) Kerrus
<i>Reseta luteola. L</i>	Dyer's weed	(A) Qased
<i>Rosa canina</i>	Dog rose	(A) Ward ez-zeroub
<i>Rosa damasca</i>	Damask rose	(A) Ward djouri
<i>Rosmarinus officinalis</i>	Rosemary	(A) Ikhil
<i>Rumex acetosella</i>	Sheep sorrel	(A) L-hummayda
<i>Rubia peregrina</i>	Sweet woodruff	(A) Fuwwa
<i>Rubia montana</i>	Mountain rue	(A) Fidjla El Djebeli
<i>Saponaria vaccaria</i>	Saponaria	(A) Tigigest
<i>Salvia officinalis</i>	Sage	(A) Salmia
<i>Tetarclinus articulata</i>	Arar tree	(A) Ara'r
<i>Thymelea hirsuta</i>	Passerine	(A) Methnan
<i>Thymus spp</i>	Thyme	Zata'r (A) and Azoukni (B)
<i>Trigonella foenum graecum</i>	Fenugreek	(A) Hulba
<i>Urticaria urens</i>	Dwarf nettle	(A) Horreiq
<i>Verbascum thupsiform</i>	Mullein	(A) Muslil al-andar
<i>Verbena officinalis</i>	Vervein	(A) Al Louisa
<i>Zea mays</i>	Indian corn	(A) Dra

Source: Benaboubou 2004

Appendix 7

Traditional activities

Female indoor and outdoor activities

Plate 7.1: Women harvesting alfafa (*Medicago sativa*) in gardens (Maghzen, July 2008).



Plate 7.2: Landscape of wheat terraces (Tagdite, October 2007).

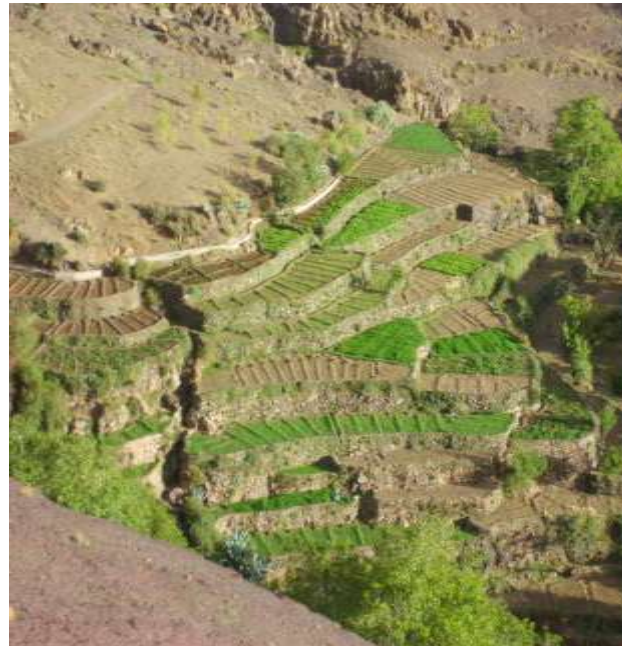


Plate 7.3 (a): Arum bread (El Maghzen, March 2008).



Plate 7.3 (b): Tanourt bread (El Maghzen, March 2008).



Plate 7.4: Souring milk (El Maghzen, October 2005).



Plate 7.5 (a): Making couscous (El Maghzen, April 2008).



Plate 7.5 (b): Sieving couscous grains (El Maghzen, May 2008).



Plates 7.6 (a and b): Women in a group making biscuits
(El Maghzen, October 2007).



Plate 7.7: Traditional grinder installed
in a basement house
(El Maghzen, February 2008).



Plate 7.8: Grinding grain in the basement
(El Maghzen, January 2008).



Plate 7.9: Traditional oven making
(El Maghzen, July 2008).



Plate 7.10: Preparing maize for grinding
(El Maghzen, September 2007).



Plate 7.11: Baking *tanourt*
(El Maghzen, August 2007).



Plate 7.12: Sorting out Luisa (*Lippia citriodora*) harvested from the garden for medicinal purpose (El Maghzen, October 2005).



Plate 7.13: Cattle fodder collected from the mountains (El Maghzen, April 2008).



Plate 7.14: Cattle fodder collected from the terraces
(El Maghzen, May 2008).



Plate 7.15: Wheat harvested from the gardens
and carried back to the village terrace for drying
(El Maghzen, May 2008).



Plate 7.16: Washing clothes at the river
(El Maghzen, June 2007).



Plate 7.17: Cracking almonds and walnuts
(El Maghzen, October 2007).



Plate 7.18: Children learning how to crack nuts
(El Maghzen, August 2008).



Male outdoor traditional activities

Plate 7.19 (a and b): Building work (El Maghzen, June 2008).



Plates 7.20 (a and b): (a) collecting Barbary figs and (b) special tool for handling the Barbary fig (El Maghzen, July 2007).



Plate 7.21: Dam building
(El Maghzen, July 2008).



Plate 7.22: Ploughing with donkey on terraces
(El Maghzen, April 2008).



Plate 7.23 (a and b): Maintenance of an irrigation channel
(El Maghzen, February 2007).



Plate 7.24 (a and b): Traditional olive press (a) and (b) added azoukni (*Thymus satureioides*) to the crushed olives for flavour (El Maghzen, January 2008).



Plate 7.25: Threshing wheat and barley
(El Maghzen, August 2007).



Plate 7.26: Shearing sheep
(El Maghzen, July 2008).



Plate 7.27: Bee keeping
(El Maghzen, May 2007).



Photos: ©Bernadette Montanari

Appendix 8

Principales étapes du processus d'identification d'une idée de projet à présenter au PMF/FEM

PROJETS BIODIVERSITE

Le PMF/FEM appuie des projets dans deux domaines : la biodiversité et les changements climatiques.

Pour définir si votre association peut obtenir un appui financier du PMF/FEM il faudra d'abord vous assurer qu'il existe au niveau de votre zone d'intervention une problématique liée à l'un de ces deux domaines.

Conditions à remplir pour obtenir un appui financier pour un projet de sauvegarde de la biodiversité :

La première condition à remplir pour qu'un projet soit examiné par le PMF/FEM est que la zone d'intervention de votre projet contienne une **biodiversité importante**. En effet, le programme privilégie les projets qui conservent des écosystèmes et des espèces animales et végétales **endémiques, rares et menacées**.

Des études menées aux Maroc ont identifié les zones où il existe une biodiversité importante. A cet effet, une liste de Sites d'Intérêt Biologique et Ecologique et de Parc Nationaux a été définie. Pour savoir si votre site se situe dans une zone où la biodiversité est importante référez-vous à la liste des sites d'Intérêt Biologique et Ecologique identifiés au Maroc en annexe de ce document. Des listes des espèces animales et végétales importantes ont également été établies. Vous pourrez consulter ces documents chez les Eaux et Forêts, vous pouvez également demander ces informations au PMF/FEM.

Démarche à suivre pour identifier si votre association peut développer un projet dans le domaine de la biodiversité ?

Etape 1 : Lisez attentivement le dépliant d'information du PMF/FEM. Consultez également le site web du programme dans lequel vous pouvez retrouver une description résumé des projets qui ont été réalisés par des associations qui ont bénéficiées de l'appui du Programme au Maroc et dans d'autres pays du monde à l'adresse suivante : **www.undp.org/sgp**

Etape 2 : Définissez si votre zone d'intervention se situe dans ou à proximité d'un site d'intérêt biologique et écologique ou dans un parc national en vous référant à la liste en annexe.

Etape 3 : Contacter les Eaux et Forêts ou la coordination du PMF/FEM pour obtenir des documents d'informations sur le site d'intérêt écologique et ou sur le parc national où se situe votre zone d'intervention.

Etape 4 : Après avoir pris connaissance de ces documents, tenir une réunion avec la Direction Régionale des Eaux et Forêt pour préciser :

- la biodiversité importante qui existe dans la zone
- le degré de dégradation de la biodiversité de la zone,
- les principaux problèmes à l'origine de cette dégradation,
- les principaux acteurs qui ont un lien avec chacun de ces problèmes,
- les projets réalisés, en cours et leurs résultats ainsi que les projets prévus.

Cette réunion devrait vous permettre de commencer à remplir les quatre tableaux en annexe (le tableau de la situation de la biodiversité au niveau du site, des acteurs qui ont un lien avec cette biodiversité, celui des problèmes et celui des projets).

Etape 5 : Vous pouvez réaliser une sortie sur le terrain pour mieux observer les richesses et constater les problèmes qui se posent au niveau du site.

Etape 6 : A partir du tableau relatif aux acteurs, sélectionnez, les catégories d'acteurs les plus importants parmi ceux que vous avez identifié, c'est-à-dire ceux qui sont le plus concernés par la biodiversité du site. Dans un second temps, identifiez des représentants de ces acteurs pour programmer avec eux une réunion de travail. N'oubliez pas d'inclure les femmes dans le tableau des acteurs concernés et par la suite de les consulter.

Etape 7 : Tenir une réunion, avec les principaux représentants des acteurs qui ont été sélectionnés. Vous validerez les informations que vous avez déjà rassemblées dans les 4 tableaux et complétez avec eux les tableaux en validant avec eux les points suivants :

- la situation de la biodiversité,
- les problèmes prioritaires à l'origine de cette dégradation et leurs causes,
- les acteurs concernés par ces problèmes.
- leurs opinions sur les projets réalisés, en cours ou prévus pour résoudre les problèmes identifiés,
- leur intérêt à résoudre un ou des problèmes parmi ceux qui ont été identifiés (tableau des acteurs colonne 3).
- les activités qui devraient être réalisées dans le cadre d'un projet pour résoudre les problèmes rencontrés.
- leurs contributions dans la réalisation de ces activités (tableau des acteurs colonne 4).

Etape 8 : Après cette réunion faites une recherche complémentaire sur les solutions qui ont déjà été mises en place dans le cadre d'autres projets pour résoudre les problématiques identifiées. Vous pouvez faire une recherche auprès des autres associations, sur le net et/ou contacter le PMF/FEM à ce sujet.

Etape 9 : Si ces solutions ne sont pas connues par les acteurs que vous avez rencontrés et qu'elles peuvent être intéressantes à mettre en place, tenir une nouvelle réunion avec eux pour leur présenter ces solutions et pour discuter sur la possibilité de les adapter. Sélectionner les solutions à retenir lors de cette réunion et préciser le budget global et les contributions des acteurs.

Etape 10 : Finalisez le formulaire et le validez avec des représentants des acteurs que vous avez rencontré avant le soumettre au PMF/FEM. Vous pourrez joindre en annexe du formulaire les tableaux 1, 2, 3 et 4.

Tableau 1 : Situation de la biodiversité au niveau du site

Nature des richesses	Etat de ces richesses	Remarques

Tableau 2 : Acteurs concernés par chacun des problèmes identifiés

Acteurs	Nature de leur implication dans la problématique identifiée	Leur intérêt/refus à intervenir pour diminuer la menace identifiée	Leur participation éventuelle
Problème 1			
Problème 2			

(Il est préférable de présenter les acteurs concernés pour chaque problème. Ne pas oublier d'inclure dans ce tableau les catégories de population habitant sur le site dont les activités ont un lien avec la biodiversité: par exemple les agriculteurs, les éleveurs, les femmes qui ramassent le bois, les femmes qui ramassent les plantes aromatiques et médicinales...); Les autres usagers du site ; Les agents de l'administration locale ou centrale ; Les élus et agents des collectivités locales, des associations qui interviennent dans le site.

Tableau 3 : Les problèmes et les solutions à mettre en place

Principaux problèmes à classer par ordre de priorité	Impact	Causes de chaque problème	Solution proposée pour résoudre le problème

Tableau 4 : Les projets et/ou études déjà réalisés, en cours ou prévus pour résoudre les problèmes rencontrés

Acteurs responsable du projet ou de l'étude	Nom du projet ou de l'étude	Date de début et de fin du projet ou de l'étude	Composantes principales du projet ou de l'étude	Enseignements tirés des études et des projets en cours ou déjà réalisés
Les Eaux et forêts				
La commune				
La préfecture				
Une ONG				
La population				
Université ou centre de recherche				
Autre				

Liste des SIBES par Provinces administratives

PROVINCES	SIBES		N°	PROVINCES	SIBES		N°
AGADIR	PN SOUSS-MASSA		G	ESSAOUIRA	Jbel Amsittene		57
	Ain Asmama		56		Dunes d'Essaouira	L	25
	Ademine		58		Archipel	L	26
	Dar Lahoussine		61		d'Essaouira		
	Jbel Kest	L	62				
	Embouchure du Tamri		27				
	Cap Ghir	L	28				
AL HOCEIMA	PN AL HOCEIMA		B	FES	Jbel Amergou		11
	Koudiat Tidighine		09		Dwiyate	H	10
ASSA ZAG	Oued Tighzert		76	FIGUIG	Jbel Krouz		69
AZILAL	Jbel Tazerkount		29	GUELMIM	Foum Assaka	L	30
	Tamga		49		Plage Blanche	L	31
	Aqqa Wabzaza		50				
	Imi n'Ifri		51				
	Sidi Meskour		52				
	Cascades d'Ouzoud	H	32				
	Oued Lakhdar	H	35				
BEN SLIMANE	Oued Cherrat		33	IFRANE	PN IFRANE		D
	Barrage Oued El	H	08		Jaaba		25
	Maleh				Aghbalou n'Arbi		26
					Plan d'eau	H	16
					Zerrouka	H	17
					Oued Tizguit	H	18
					Dayet Ifrah	H	22
					Aguelmam	H	23
					n'Tifounassine	H	24
					Plans d'eau		
					d'Amrhass		
BENI-MELLAL	Tizi n'Aït Ouirra		28	KELAAT SRAGHNA	Barrage Al	H	29
	Deroua		42		Massira	H	31
	Bou Tferda		48		Sahb Al Majnoun		
BERKANE	Beni Snassene		14	KENITRA	Mamora		31
	Barrage Mohammed	H	02		Merja Bokka	H	04
	V				Oued Fouwarate	H	05
					Merja Oulad Skhar	L	13
					Merja Bargha	L	14
					Merja Halloufa	L	15
					Merja Zerga	L	16
					Sansouire du	L	17
					Sebou	L	18
					Sidi Bou Ghaba		
BOUJDOUR	Pointe d'Awfist	L	37	KHEMISSET	Oued Korifla		32
					Tsili		34
					El Harcha		35
					Kharrouba		36
					Ment		37
					Bou Riah-Beddouz		38
					Dayet Er Roumi	H	09
BOULEMANE	Bou Iblane II		20b	KHENIFRA	PN HAUT ATLAS		E
	Bou Naceur		21		OR.		27
	Outat El Haj		22		Talarhine		38
	Jbel Tichoukt		23		Bou Riah-Beddouz		40
	Aghbalou n'Arbi		26		Ouardane		46
	Jbel Taghioult		45		Jbel Ayachi	H	25
	Source de Tit Zill	H	20		Aguelmam Sidi	H	26

PROVINCES	SIBES		N°	PROVINCES	SIBES		N°
					Ali Ta'nzoult Aguelmam Azegza Aguelmam Mi'Ammi Aguelmam Abekhane	H H	27 28
CHEFCHAOUEN	PN TALASSEM-TANE Jbel Bouhachem Brikcha Souk El Had Jbel Tizirane Cirque d'El Jebha Côte Rhomara		A 05 06 07 08 L 05 L 06	KHOURIBGA	Khatouat Beni Zemmour		39 41
EL JADIDA	Baie de Haouzia Jorf Lasfar Sidi Moussa Oualidia	L L L	22 23 24	LAËYOUNE	Oued Amma Fatma Oued El Ouar Lagune de Khnifiss	L L L	34 35 36
ERRACHIDIA	PN HAUT ATLAS OR. El Kheng Merzouga Msissi Lac d'Isli Lac de Tislite		E 68 70 71 H 33 H 34	TAN-TAN	Msseyed Embouchure du Drâa Oued Cheibeka	L L	77 32 33
LARACHE	Khemis es Sahel Marais Larache Merja Oulad Skhar Merja Bargha	L L L	04 12 13 14	TANGÉR	Perdicaris Cap Spartel Oued Tahadart	L L	01 10 11
MARRAKECH	PN TOUBKAL Palmeraie Marrakech Aghbar Tichka Aïn Asmama Assif N'Tifnoute		F 43 54 55 56 H 40	TAOUNATE	Jbel Lalla Outka Aïn Bou Adel Barrage Idriss 1er	H H	10 03 11
MEKNES	Jbel Zerhoun		30	TAROUDANT	PN TOUBKAL Aïn Asmama Tafingoult Jbel Kest Assads Assif N'Tifnoute Source à Tizi N'Test	H H	F 56 59 62 60 40 41
NADOR	Jbel Gourougou Barrage Mohammed V Emb. Moulouya Sebkha Bou Areg Cap des 3 Fourches	H L L L	13 02 01 02 03	TATA	Oasis de Tissint Imaoun Aït Oumribet		73 74 75
OUARZAZATE	Grotte d'Akhyam Vallée de Télouat Jbel Sargho Oued Todra Oued Mird Barr. Al Mansour Ad Dahbi		47 53 66 67 72 H 42	TAZA	PN TAZEKKA Azrou Akechar Jbel Ouarirt Bou Iblane Bouzemmour Bou Naceur Barrage Mohammed V	H H	C 12 18 20 20c 21 02
OUED ED-	PN DAKHLA		H	TEMARA	îlot de Skhirat	L	21

PROVINCES	SIBES		N°	PROVINCES	SIBES		N°
DAHAB	Hassi Touf	L	38				
	Baie de Dakhla	L	39				
	Baie de Cintra	L	40				
OUJDA	Chekhar		15	TETOUAN	PN		A
	Lalla Chafia		16		TALASSEMTAN		02
	Lalla Mimouna		17		E		03
	Emb. Moulouya	L	01		Ben Karrich		05
					Jbel Haabib	L	07
			Jbel Bouhachem	L	08		
			Koudiet Taifour	L	09		
			Lagune de Smir				
			Jbel Moussa				
RABAT	Bou Regreg	L	20	TIZNIT	Jbel Kest		62
					Anezi		63
					Aït Er Kha		64
					Boû Timezguida		65
SAFI	M'Sabih Talaa Sebkha Zima	H	44 30	SEFROU	El Aderj		19
					Bou Iblane I		20a
					Takeltount		24
					Dayet Iffer	H	14
SALE	Mamora Oued Korifla Falaise Sidi Moussa	L	31 32	SETTAT	Khatouat		39
					Barrage Al	H	29
					Massira		

Source: CDRT 2008

Appendix 9

The Distillation Project in the Agoundis Valley

Plate 9.1: The distillation project in the village of El Maghzen. (a) The building for the alembic near the school at the entrance of the village; (b) the village of El Maghzen as viewed from the direction of Tijrichte (March 2009).



Plate 9.2: (a) The first building rented for the distillation project in 2005 and before the authorities showed interest in the project. The building is situated at the entrance of the village (El Maghzen, April 2005).



Plate 9.3: The panel installed by the Department of Water and Forestry authorities to announce the incorporation of the Agoundis valley within the Toubkal National Park development scheme in 2006. The panel is situated at the entrance of the commune of Ijoukak, at the junction before entering the Agoundis valley (El Maghzen, September 2006).



Plate 9.4: The start of building work on the distillation project. All stone used for the construction came from surrounding mountainside (El Maghzen, April 2007).



Plate 9.5: Building work in progress (El Maghzen, June 2007 and July 2007).



Plate 9.6: The building as an empty shell waiting for the installation of the roof (El Maghzen, September 2007).



Plate 9.7: Building work started again after the INDH allocated a second sum of money to complete the building. This photograph also shows the internal floor to accommodate the alembic (El Maghzen, April 2008).



Plate 9.8: A view from the laboratory of the unfinished main room where the alembic will be installed (El Maghzen, May 2008).



Plate 9.9: View of completed distillation building (El Maghzen, November 2008).



Plate 9.10: View of the back entrance of the building for loading plant material for distillation (El Maghzen, March 2010).



Plate 9.11: Distillation buildings complex showing (in the background with the pink roof) the plant store, and the shop selling oils and herbal products; in the foreground, plastic tunnels to cultivate vegetables and herbs (El Maghzen, May 2011).

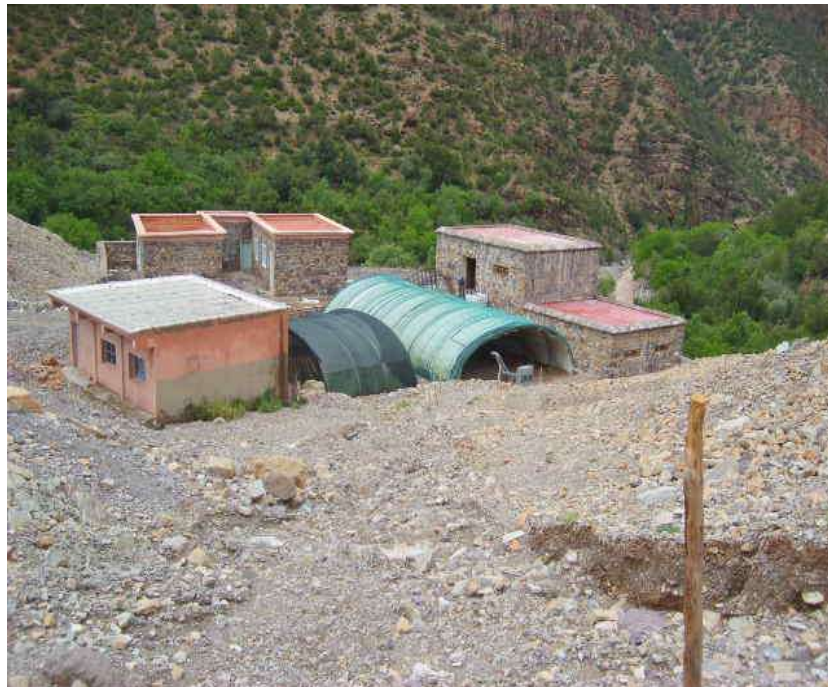


Plate 9.12: (a) The installed alembic with a capacity for 300 kilograms of plant material; (b) the condenser (El Maghzen, 2011).



Plate 9.13: The process of distilling essential oil

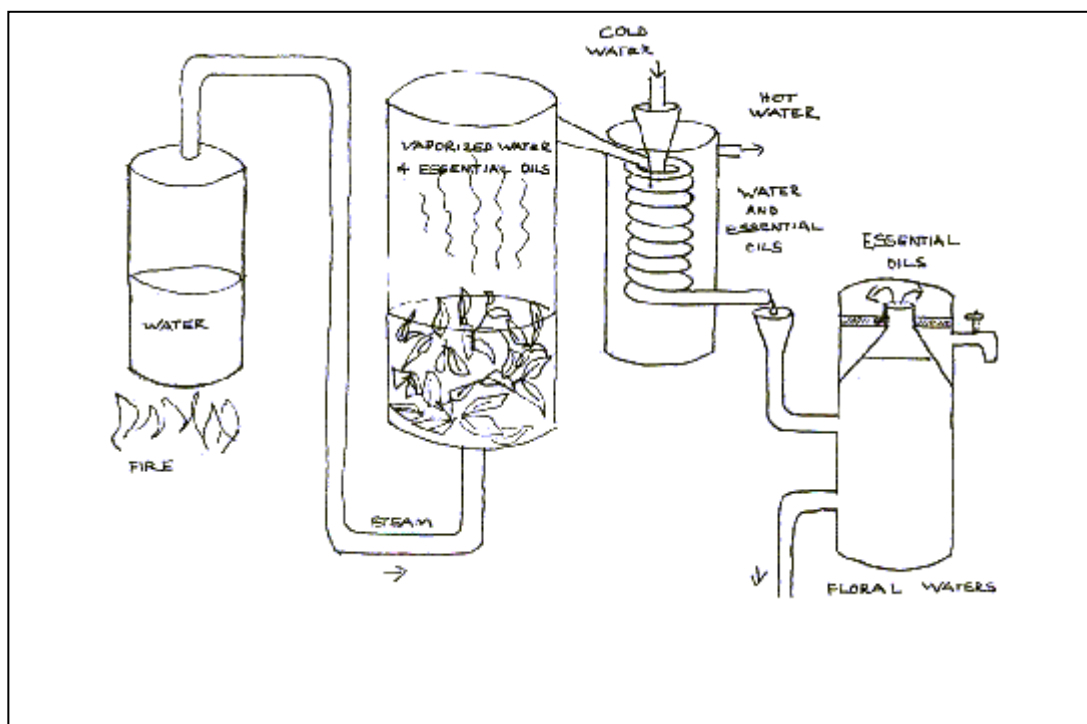


Plate 9.14: (a) A worker from El Maghzen loading lavender (*Lavandula dentata*) into the alembic from above; (b) used plant material released from the bottom of the alembic after distillation (El Maghzen, May 2011).



Plate 9.18: Hydrolat (floral water) bottles (rear) and small bottles (front) of essential oils for sale in shop in El Maghzen; (a) sage (*Salvia aucheri*), thyme (*Thymus satureioides*) and (b) lavender (*Lavandula dentata*) at the front (El Maghzen, May 2011).



Photos: ©Bernadette Montanari

Appendix 10 Survey questionnaire

Questionnaire regarding the perception of the project at the village level

1. How do you know about the project?
2. What are your views of the distillation project?
3. Has there been any other project before?
4. Do you think you can earn money in the project?
5. What will you do with this money?
6. What do you expect from the project?
7. Are you ready to work and benefit from the project?
8. What do the local authorities do to support the project?
9. Who is working hard to implement the project in the valley?
10. What do you know about the technical purpose of the alembic?
11. Do you think this project will succeed?

Thyme harvest interview

1. Is thyme harvesting an important source of income for you?
2. How many kgs do you collect per day?
3. How much are you paid for fresh thyme per kg?
4. Do you keep any fresh thyme for drying?
5. How much are you paid for dried thyme per kg?
6. Who pays you this money and when?
7. Do you cut thyme or pull it out?

Interviews middlemen

1. What do you think of the essential oil distillation project?
2. Do you think that you can earn money in the project?
3. How would you spend the money?

4. What do you expect from the project?
5. Would you be willing to work in the project?
6. How do you think the project could change the way you work now?
7. As a middleman, what could you contribute to the project?

Interviews officials

1. What are your views of the distillation project for the inhabitants of the Agoundis valley?
2. What are the amenities provided by the (organisation's name) to facilitate the implementation of the project?
3. What are the (organisation's name) responsibilities for the implementation of the project?
4. What facilities did the other institutional partners provide for the project?
5. What are the main financial sources allocated to the project?
6. What do you expect from the local population for the implementation of the project?
7. Do you think that the local population can become responsible for the implementation of the project?
8. How do you see the project in five years' time from now on?

Interview President and Secretary of the Cooperative

1. What do you think of the distillation project?
2. What do you expect from the project?
3. Are you ready to work in the project?
4. Which authorities work to implement the project?
5. What are the facilities that the authorities have provided for the project?
6. What are the financial sources allocated to the project?
7. As the President (Secretary) of the Cooperative, what are your responsibilities?
8. How do you see the project in 3 to 5 years time?
9. Do you think you can earn money from the project?

Appendix 11

Policy implications and recommendations

My research indicates clearly the limitations and failures of Moroccan government policies and their consequences for the local communities. These have long-term implications for both local communities and the government. The measures implemented by central government tend to be short-term solutions to long standing problems, in which the issues of mountain governance and the recognition of Berber regional culture remain unresolved. While the government has recently modified the national constitution and reviewed its policies relating to Berber culture, the impact of this change has yet to be felt at village level.

The Agoundis valley distillation project could potentially stand as an exemplary model of community-enterprise, working in co-management with the local authorities, contributing ideas for entrepreneurial schemes relevant to the socio-economic development of the region. In connection with this, a number of specific recommendations can be made, in relation to (a) land access, (b) tax and insurance, (c) the role of the middlemen, (d) accountability and (f) education, (g) community recognition and (h) conservation of traditional knowledge.

To overcome the issue of land access, it is vital that an equitable compromise be reached between the local population and the authorities. This status may be granted to the local population on a leasehold agreement for a given period, or restituted to the local community. As part of this agreement, the Department of Water and Forestry should allocate plots of land for collection that realistically meet the population's needs and recognise that traditional natural resource management is essential for the maintenance of the allocated land. It is important that the communities be involved in this process, so that a sense of shared responsibility is developed. To address the problems relating to thyme extraction and its regeneration, information must be communicated between the villages and the authorities to determine the quantities to be harvested within village's boundaries and for the collection of more important quantities at higher altitudes according to the plant transects results. The issue of natural resource sustainability must be raised in villages and villagers be fully informed of the technical aspects of plant sustainability. The local population must engage in planting thyme, caring for its cultivation at higher altitudes, with the assistance of Department of Water

and Forestry officers for the technical side of plantation. There must be a partnership between the authorities and the community. The role of the traditional *jama'a* has an important role to play in appointing the villagers in rotating teams to care for the plants at these altitudes.

It is increasingly recognised that the poor are hit the hardest in situations of physical incapacity, while disability reduces the ability to earn an income. Schemes of implemented insurance policies in the countries of Latin America and the Caribbean (Dercon et al. 2007; Trujillo et al. 2005; Skees 2008), and in India (Dror 2006; Dror et al. 2006), have been relatively successful. Daily subsistence is difficult for the villagers, and to buffer for loss of income due to ill health, or accidents occurring inside or outside the harvesting period, a fund should be created for the harvesters with agreements drawn between the Cooperative and an insurance broker. Currently, villagers cannot afford such a scheme, though they could contribute a small amount of money on a monthly basis. This fund would cover the villagers for accidents likely to occur during harvesting periods but also during their daily activities. In case of accidents or ill health, the insurance can provide a small daily allowance that helps the family with subsistence needs. Equally, the cooperative is not viable for paying tax. It should therefore be exempted for the first three years, so that capital can be built up.

Middlemen have an important part to play in the cooperative and in the development of the enterprise. Membership of the cooperative for middlemen should be optional. The collection and quantity of harvested plant material should be limited to allocated sectors, according to agreements drawn up for land access and collection between the villagers and the authorities. The possibility of becoming stakeholders should be offered to the middlemen in order to establish links with external companies, either for the sale of dried thyme or for essential oil distribution. They should be remunerated on a percentage base. Good business connections, especially with foreign companies depend on transparency. Therefore, the Cooperative should be able to apply for the Fair Wild Premium scheme. This would encourage responsibility and accountability to other external agents and minimise the risk of corruption.

Accountability, as described throughout the thesis, is a major problem. The local commune must therefore become responsible and accountable in its initiatives to village members of the Cooperative as well as to the higher authorities, the INDH at the province level. Just as the province is accountable to higher courts of audit, the Cooperative's accounts must be justified to the higher authorities. In case of conflict or

mistrust, the possibility of hiring independent audits should be considered. The local employment schemes should encourage entrepreneurial development projects. Therefore, the bureau-members of the cooperative might be advised to establish a business plan for long-term prospects and this can be done with the help of professionals, as part of the local authorities' development schemes to increase capital available into the local economy. Within the Cooperative, it is vital that members of the bureau become accountable to the local population. Harvester members should have a right to information and be consulted on the Cooperative's articles, activities and accounts. Cooperative members should be able to call for a general assembly and vote for the election of new bureau members if dissatisfied with present members. This can be done in the presence of the local authorities, the local commune and all villagers at village level.

The government, through its lower levels of administration, increasingly promotes regionalisation. The INDH in Al Haouz Province and its administrative ramifications should be responsible for delivering educational programmes at the local level. These could be delivered as part of bigger schemes addressing rural unemployment and socio-economic development of the region. The local commune could in turn become responsible and accountable for delivering these programmes within the communities. These programmes might address basic knowledge of management and commercial development, problems related to plant sustainability, environmental issues in general, and computer literacy (now that electricity has been installed in most villages). Further, workshops on plant sustainability, guidance on plantation could be conducted by the Department of Water and Forestry at village level, using the Cooperative building complex. Villager members would be expected to attend these sessions that could be rewarded by insurance bonuses as a special fund for children's education. Women in particular, as members of the Cooperative, should be encouraged to attend training in product development. These programmes could address post-harvesting techniques, storage, product design and labelling. Women could be remunerated monthly from the sale of products (herbal mixtures, biscuits and couscous). Women should be informed of their rights as members of the Cooperative, be able to consult the accounts and receive information on the cooperative operations.

Following the recent events sweeping the Arab world (the so-called Arab Spring), the Moroccan government put forward a new constitution. This was approved through a national referendum in July 2011. The King designated a team of experts to

design the articles rather than using an independent body of representatives (Ottaway, 2011). In the new constitution, the concept of regionalisation and recognition of Amazigh, Saharo-Hassani, Andalusian, Hebraic and Mediterranean influences as part of Moroccan cultural heritage are addressed. The constitution also stipulates that Amazigh language be officially recognised as the second official language of the country (Texte intégral du projet de la nouvelle constitution, June 2011). In theory, communities such as those in the Agoundis valley should be able to claim not only regional recognition but the right to Tachelhit language tuition in schools. Currently, the communities' lack of representation has made this impossible. However, Tachelhit language tuition could be facilitated through representatives of the state at the commune level, as part of the collaboration between local authorities and communities.

In this thesis, I have noted the vulnerability of community knowledge, especially in the context of economic development. Conservation of this knowledge is part of the local cultural heritage, and it is important that measures be introduced to prevent its erosion. It is through the promotion of income generating activities that these traditional practices are most likely to be conserved. This may be achieved in several ways. First of all, regarding women's traditional activities, traditional cooking (*tanourt*, *arum*, homemade couscous and *tajine*) could be promoted as part of touristic programmes. Workshops could be run for tourists. Where tourists stay in village accommodation, they could participate in cooking sessions (*tajine*, bread and traditional couscous making) as well as in demonstrations of herbal tea preparation. A plant herbarium could be created in a shop situated at the entrance of the village, emphasising the importance the sustainable extraction of mountain plants in the local economy, and in particular thyme, lavender and sage. Guided visits to the distillation unit could be available to tourists with the onward sale of herbal products. It is important that the promotion of traditional knowledge becomes leverage not only for generating income but for raising awareness of traditional practices as part of the Berber heritage.

The same argument applies to traditional organic agriculture as applies to home cooking and medicinal plant extraction. Guided tour of the villages, gardens and surrounding mountains might be included in a general eco-tourism package that would address the importance of biodiversity conservation in fragile mountain environments.

The integration of these activities as part of an ecotourism development initiative would not only generate income in the villages but would also create awareness of traditional community values and reinforce local identity. Children have a

part to play in this. Because children nearly always accompany their parents, the recognition of these traditional practices through economic development is likely to be transmitted to the children. It might be hoped, that this would not only contribute to the community welfare but also to the continuation and conservation of these communities' traditional knowledge practices.

