

Chapter 6

Migration impact research in the Todgha oases of Morocco by the University of Amsterdam

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6.1. General description of the Todgha valley and research oases

6.1.1. The valley's location and general description

The Todgha is one of the river valleys on the southern slopes of the High Atlas Mountains that drains the melt- and rainwater captured in the high mountains south- and east of the Sahara desert. In spite of the arid conditions reigning south of the Atlas climate divide, melt- and rainwater continuously recharge aquifers feeding numerous sources and rivers. This explains the existence of a concentration of oases south of the Atlas. With its chief town, Tinghir, situated 169 km east of Ouarzazate and 162 km west of Errachidia, the Todgha is centrally located between Morocco's main oasis regions, the Draâ valley and the Tafilalt.

From its source near the oasis of Zaouïa Sidi Abdelali, the ancient oases of the Todgha stretch out about thirty kilometres downstream on both banks of the river. In the upstream part of the valley, the river water flow is perennial. Several small dams in the river ensure the irrigation of fields. Further downstream, the flow of the Todgha gradually decreases, until the flow becomes entirely subsurface after passing Tinghir. In the lower Todgha, therefore, more and more use has to be made of *khattara* techniques¹ in order to tap underground water resources. Further downstream from the easternmost point of the ancient oasis, the so-called Ghallil plain stretches out over a length of about ten kilometres on the right bank of the Todgha. Formerly used as collective pasture land, this plain is now increasingly reclaimed for relatively large-scale agriculture. Here, peasants are dependent on the use of Diesel engines to pump up underground water.

The Todgha is a medium-sized river oasis, with a cultivated area of almost forty kilometres in length, and a width varying from one hundred meters near its sources to four kilometres downstream. It is situated at a relatively high altitude, from 1420 m near its source to 1100 m in the Ghallil plain. In 2000, the valley housed more than 70,000 inhabitants living in more than 64 *qsour*² and their modern extensions.

¹ The *khattara* represents an ancient, sophisticated technique enabling the drainage of underground water resources for irrigation. The *khattara* system taps the groundwater table by digging a nearly horizontal tunnel from the well to the surface over a long distance. At regular intervals, vertical shafts are dug which provide access to and maintenance of the tunnel. As the *khattara*'s tunnel is constructed in such a way that it has a flatter gradient than the terrain under which it is constructed, the tunnel transporting the water becomes gradually shallower until it emerges above-ground after a distance of several kilometres from the first well, which mostly lies at a depth of 10 to 20 meters (cf. De Haas & El Ghanjou 2000).

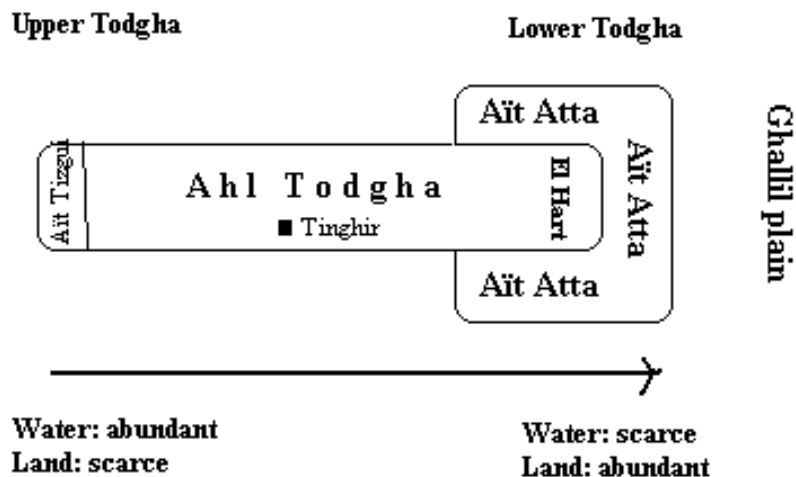
² *Qsour* (pl., sing. *qsar*) is the Arabic name (*ighrem* in Berber) for a traditionally fortified oasis village in southern Morocco, characterised by a dense, concentrated adobe habitat located within a common, defensive wall.

6.1.2. Population and ethnic composition

Its perennial source, its important agricultural resources, and its location on trading routes, have all given a strategic importance to the Todgha valley. The age-old struggle for dominance of the valley and the numerous armed conflicts between ethnic groups and tribes is reflected in the diverse ethnic composition of the valley. As other oases in the Maghreb, the Todgha has been an ethnic crossroads for many centuries. Given the rarity of water resources in this arid environment, population groups have contested each other over the control of the source of the Todgha as well as the agricultural land irrigated by this water. The actual settlement pattern of the different ethnic groups should be seen in the light of continuous struggle and war for the control of important water and land resources.

Two main ethnic groups make up the population of the Todgha valley: the Ahl Todgha in the upper Todgha and the Aït Atta in the lower Todgha. The ethnic groups live in neatly segregated zones of the valley. Although all these groups speak Tamazight Berber, they have distinct ethnic identities, which is reflected in a taboo on intermarriage between these groups. Especially in the lower Todgha, tensions between Ahl Todgha and Aït Atta are still intense, and regularly result in open hostility and small-scale warfare, particularly concerning the control and division of land and water resources.

Figure 6.1. Simplified schematic ethnic and resource map of the Todgha valley



Within the Ahl Todgha, two sub-groups have to be distinguished: the generally light-skinned *imazighene*, and the generally dark-skinned *iqabline* (known in the scientific literature as *haratin*, cf. Ensel 1999). These two Ahl Todgha groups live side by side within the same *qsour*, though spatially separated in distinct ‘quarters’ and divided by separate ethnic lineages. ‘White’ and ‘Black’ lineages do not intermarry. Distinct from these general groups, separate ethnic groups such as *shurfa* (descendants of the Prophet Muhammad), *mrabtin* (descendants of local saints) and, until recently, Jews, have lived in separate groups in the Ahl Todgha *qsour*. In addition to the mixed *qsour*, there are also a number of mono-ethnic *qsour* in the Ahl Todgha territory which are uniquely inhabited by either *imazighene* or *iqabline*. A separate group, formed by two large Ahl Todgha *qsour* -- El Hart Mourabidine and El Hart Nyamine – and located at the ‘frontier’ with Aït Atta territory, is uniquely populated by *iqabline*. Three of the four research oases are located within the Ahl Todgha-dominated part of the valley, but their internal ethnic composition reflects the ethnic heterogeneity of Ahl Todgha.

The first research oasis, *Zaouïa Sidi Abdellali* (hereafter *Zaouïa*), is a village lying second-to-last upstream in the Todgha, at a point where the valley is very narrow (less than one kilometre) and hemmed in by rather steep mountains. Strictly speaking, the inhabitants of *Zaouïa* are not part of the Ahl Todgha. They belong to the Aït Tizgui, an ethnic group affiliated with tribes inhabiting the High Atlas Mountains north of *Zaouïa*. Most inhabitants of *Zaouïa* are so-called *mrabtins* (i.e. descendants of local saints). The *mrabtin* of *Zaouïa* are believed to descend collectively from a saint called Sidi Abdellali, whose tomb is located in the oasis. According to local tradition, the three ethnic lineages within the *qsar* represent the descendants of the three sons of the holy *marabout*. On the *mouloud*, the birthday of the prophet Muhammad, a *moussems* (pilgrimage) is organised in the village. In the past, the religious function of *Zaouïa* was very important. Although *Zaouïa* is predominantly *imazighene*, some *iqabline* families inhabit the *qsar*. As their number is too small to form a separate lineage, as in many other *qsour* they have been incorporated into one of the *imazighene* lineages. Nevertheless, they are not considered as *mrabtin*, and they do not marry with White members of the lineage to which they formally belong. Until recently, the *mrabtin* married within the *qsar*. Due to their religious status, in past centuries the inhabitants of *Zaouïa* have received land as donations from families in the Saghro and Atlas Mountains. Therefore, many families also possess land outside the Todgha. They normally hire sharecroppers to cultivate those distant lands.

The second research oasis, *Tikoutar*, is located near Tinghir in the downstream portion of the upper Todgha basin. The population of *Tikoutar* is comprised of a mixture of *imazighen* and *iqabline*, and divided into eight mono-ethnic lineages. Black and White lineages used to live apart geographically in different quarters of the old *qsar*, which has by now been almost entirely abandoned. In the new settlement, ethnic segregation is repeated to a certain degree, with *imazighene* and *iqabline* living in different quarters (Büchner 1986). The ethnic cleavage within the oasis is a continuous source of conflicts, and the ethnic dimension is overshadowing local politics. Despite these internal problems, the villagers perceive themselves as a single unit in conflicts with neighbouring villages, and they strongly identify themselves as Ahl Todgha.

The third research oasis, *Aït El Mesquine*, is also a Ahl Todgha oasis, and is located in the central part of the lower Todgha, on the boundary separating the two *iqabline* oases of El Hart and also close to the Aït Atta territory. The four ethnic lineages of the village are all *imazighen*. Recently, some *iqabline* of the neighbouring El Hart oases have joined the ranks of the inhabitants of Aït El Mesquine. They generally work as sharecroppers (*khammes*), agricultural or construction labourers, functions which they sometimes combine with guarding the houses of migrant families who have left the oasis.

The second ethnic group inhabiting the Todgha, the Aït Atta, is comprised of former semi-nomads, *transhumants*, whose origins lie in the Saghro mountains directly south of the Todgha. On the eve of French colonisation, they controlled much of southern Morocco. Over the course of the past two or three centuries, they settled in the *qsour* located downstream from the Todgha on the fringes of the ancient oasis. Here, they practice agriculture based on *khettara* irrigation, as the Aït Atta don't have access to the perennial river water of the Todgha controlled by the Ahl Todgha.

The fourth research site, *Tadafelt*, is located within the Aït Atta zone and is the oasis located at the most downstream point in the survey. The inhabitants of *Tadafelt*, who live in five lineages, are part of the Aït Atta. Their settlement in the Todgha is more recent compared to that of the Ahl Todgha. *Tadafelt* is also among the most isolated and impoverished of the oases in the Todgha.

6.1.3. History

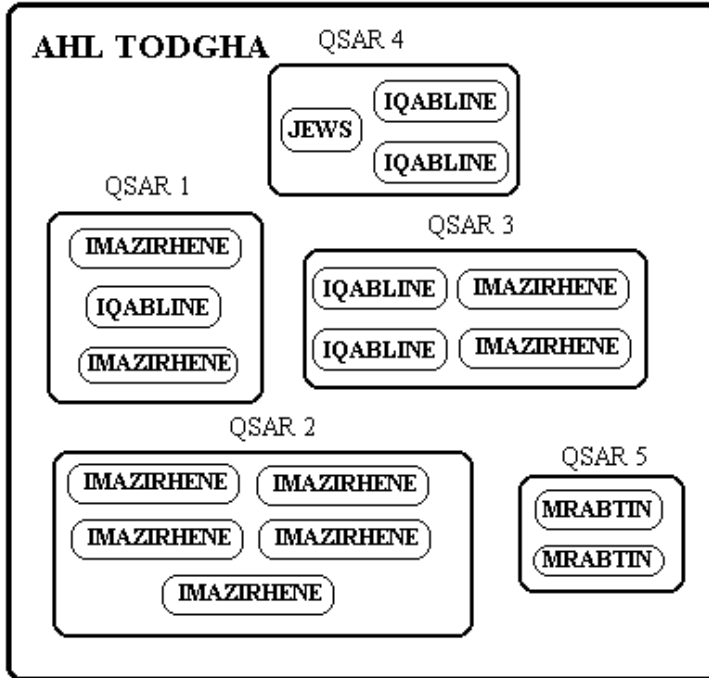
Apart from brief and general descriptions by early travellers, no reliable sources have been uncovered which may throw light on the ancient history of the Todgha. The only thing that seems certain is that the Aït Atta were the latest ethnic group to settle in the valley. In pre-colonial times the Todgha valley belonged to so-called *bled es-siba*, as, apart from some short periods in its history, the territory always remained independent of central *makhzen* state power. For the sultans located in capitals west or north of the Atlas Mountains, it was difficult to control this distant and backward area. Moreover, the Todgha valley was less economically and politically important than Morocco's principal oasis centres, the Draâ and the Tafilalt. Control of the latter areas was important in order to guarantee the sultan's crucial interests in the trans-Saharan caravan trade. Although the Todgha remained largely beyond control of central state power, it was the subject of a limited number of *harkas* (the sultan's military campaigns), which constituted an attempt to control trading routes and collect tribute. Nevertheless, until the 20th century they never gained permanent control over the *qsour* of the valley (cf. De Haas & El Ghanjou 2000).

As in the remainder of southern Morocco, nomadic or semi-nomadic tribal groups tried to control the oases by extorting so-called *ra'ya* (protection) agreements from sedentary populations. In the 19th century, the Berbers of the Aït Atta tribal confederation managed to dominate much of southern Morocco. Nevertheless, even the rapidly expanding and powerful Aït Atta did not succeed in gaining total control of the Todgha, and succeeded in settling only within the ecologically marginal, downstream fringes of the valley (see figure 6.1). Until the early 20th century, the Todgha always maintained a remarkable degree of independence from *makhzen* and Aït Atta power.

The signing of the Fes treaty in 1912 marked the formal beginning of the French and Spanish occupation of Morocco. However, it would take two additional decades of bloody war to defeat the numerous inland tribes who intended not to honor the treaty signed by the sultan, thus rebelling against central power. Resistance was at its fiercest in the northern Rif mountains and southern oasis areas, and it was only in the 1930s that the French gained effective control over these zones. The Aït Atta was the last Moroccan tribe to resist the French. In the Bougafer war of 1933 the Aït Atta were eventually defeated in their native Saghro mountains.

The second half of the 20th century was marked by the rapid development of infrastructure, a process which increasingly linked the Todgha with other parts of Morocco. Formerly based on largely self-sufficient subsistence agriculture, over the course of the 20th century the valley has been increasingly opened up to the outside world, and the Todgha have become increasingly integrated into the national and international economy. This is most clearly reflected in strong migration towards large cities and foreign, mostly European, countries. However, as a small but ancient trading centre, the old *qsar* of Tinghir in the past few decades has been expanding at a spectacular rate. It has become one of the south's booming centres, with intensive commercial and small-scale industrial functions, attracting people not only from within the valley but from its wide surroundings. Today, the Todgha is not only a place of departure for internal and international migrants, but also an immigration destination, highlighting the fundamental complexity of contemporary migration patterns.

Figure 6.2 Imaginary scheme of the internal ethnic structure of typical Ahl Todgha *qsour* (ethnic lineages - *âadams* - living in heterogeneous *qsour*)



6.1.4. Political structure

Before the colonial intrusion, the basic unit of socio-political organisation within the *qsar* was the so-called *âadam*, or the ethnic lineage. Each *qsar* is composed of several lineages. Depending on their population size, most *qsour* comprise two to eight lineages (for a hypothetical example, see figure 6.2). Each lineage, in turn, is composed of several extended family groups. The *qsour* of the Todgha are politically independent of each other. It is important to observe that the existence of lineages is generally limited to one *qsar*, so no strong inter-*qsour* solidarity between different sub-strata (i.e. lineages) of the *qsour* exists. For example, *iqabline* of different *qsour* do not organise themselves on valley level against *imazighene* in general. Regardless of their specific ethnic background, people identified and still do identify themselves strongly with the *qsar* they inhabit. Among the Ahl Todgha, the notion of ethnicity is strongly territorialised. The *qsar* is, thus, after lineage, the second and most important level of socio-political organisation. The Aït Atta *qsour* are all mono-ethnic, and all the inhabitants of one particular *qsar* belong to the same lineages within the Aït Atta tribe. In general, the Aït Atta have a stronger common tribal identity than the Ahl Todgha, who comprise a patchwork of different ethnic backgrounds and do not have a commonly imagined ancestor.

Each year, the *qsar*'s *jemâa* (traditional village community³) elects a chief (*amghar*), who is usually responsible for settling conflicts between families and lineages over land, water, and other issues; ensuring the maintenance of the irrigation system; and representing the *qsar*'s interests vis-à-vis other *qsour*⁴. In some *qsour*, in addition to a supreme *amghar* there exists a yearly elected special *amghar n'tamazirt* ('land and water chief'), who is specifically responsible for all agricultural affairs. In the absence of a central power and

³ More precisely, this is the 'council' of village notables, normally with representatives from each lineage.

⁴ For an extensive review of the political institutions regulating land and water management, see Otte 2000.

centrally-defined legal institutions, conflicts between *qsour* over, for instance, the distribution of water and land could easily result in armed conflicts between *qsour*, which have been indeed frequent (cf. De Foucauld 1885: 222). Only in the case of external threats have the different Ahl Todgha *qsour* united in struggle against a common enemy (e.g., attacks by nomad tribes such as the Aït Atta) (Beaurpère 1931:217).

The Ahl Todgha have been successful in defending the valley's important land and water resources against invading tribal confederations, in particular the Aït Atta. The Ahl Todgha have also remained independent of 'protection' and tribute exactions of conquering tribes. Reviewing an ethnic map of Morocco, the Todgha attracts attention as a rectangular 'ethnic enclave' among the large tribal confederations of southern Morocco. Confronted with a common external enemy, however, the different *qsour* of the Ahl Todgha have drawn on their warrior traditions to unite in defence of their territory, protected by the fortress-like habitation of the *qsour* supported by a chain of watch-towers (cf. Büchner 1986).

These fractions do not always represent existing ethnic groups, but follow ethnic boundaries wherever possible. Most upstream, Aït Tizgui represents a separate ethnic group under the same name. Further downstream we find the fractions of Aït Snane, Aït Igourtane, Ahl Tinghir, Aït Wamast and Harratin. Except for the last fraction, these all belonged to Ahl Todgha and are rather administrative than ethnic entities. Each of these fractions is represented by a so-called cheikh on the fraction-level and by several moqaddem on the village-level.

The valley's autonomy and political structure has altered fundamentally over the course of the 20th century. Following the conquest of the Todgha and surrounding areas, the French rapidly established a modern administrative structure by creating a 'Bureau des Affaires Indigènes', which fell under the authority of a French officer. The colonial authority created the Annexe de Tinghir, which comprised the Ahl Todgha, El Hart, and Aït Atta of the lower Todgha. At one higher administrative level, the Annexe de Tinghir fell under the jurisdiction of the Cercle du Dadès-Todgha. The Todgha was further subdivided into several *fractions* (administrative districts).

Following independence in 1956, the administrative structures established by the French have remained largely intact. The area became incorporated within the structure of the central Moroccan state. After independence, the Todgha was divided into two *communes rurales* ('rural municipalities'), both governed by a state-appointed *caïd* governing a so-called *caïdat*. The Todgha was further subdivided into several *fractions* (administrative districts), headed by a *cheikh*. Although *fractions* do not always represent existing ethnic groups *per se*, they follow existing ethnic boundaries, if possible. The *cheikh* in turn supervises several *moqqadim*, appointed chiefs responsible for one to three villages (cf. De Mas & Kruithof 1992).

In 1992, the administrative situation changed for the second time since independence. In that year, the town of Tinghir received the status of *municipalité* ('urban municipality'), a recognition of its de facto urban character, and the rest of the territory was divided into three *communes rurales*. In the upper Todgha, the rural *commune* of Todgha Oulya (literally 'upper Todgha') was created. The research village Zaouïa is a part of this *commune*. Downstream, the new *municipalité* of Tinghir not only comprises the actual urban centre but the surrounding *qsour* as well, including the research oasis Tikoutar, both of which are increasingly integrated into the urban system of Tinghir. Downstream from Tinghir, the *commune rurale* of Todgha Souffla (literally 'lower Todgha') was created, of which Aït El Meskine is a part. The commune of Taghzout n'Aït Atta, which governs all the Aït Atta *qsour* of the Todgha -- including the research oasis of Tadafelt -- continued to exist, but was extended slightly. The municipality is governed by a so-called *pasha*. The three rural

communes remain under the authority of one single caïd, whose office is located in the caïdat in Tinghir (the former Bureau des Affaires Indigènes).

On the municipal level a modern-style representative council was introduced which has, besides its name, nothing in common with the traditional *jemâa*. As we will see, the political integration of the Todgha has fundamentally eroded the power and effectiveness of this traditional village institution. The latter has continued to exist, but has lost most of its influence, with important consequences for community life and agriculture.

6.2. Methodology

Among the 64 *qsour* in the Todgha valley, four oases were selected in order to study in more detail the linkages between migration, agricultural development and resource exploitation. Environmental, agricultural, socio-economic and ethnic characteristics vary to a large extent among the oases of the Todgha. The oases have been selected in such a way that a more or less complete coverage of the different types of oases that are found in the Todgha valley has been achieved. Therefore, both oases in the upper and lower Todgha were selected. The selected oases (see table 6.1) reveal a high variety of land and water resources, migration patterns, ethnic composition, irrigation methods and cropping patterns.

Research in each oasis started with a rapid rural assessment, comprised of conversations with oasis inhabitants, transect walks, mapping and interviews with key actors. These activities took place in the period October-December 1998. Subsequently, a survey was conducted using household questionnaires, which were developed and tested in the field. As the oases were rather small (500-1000 inhabitants), no sampling methods were used, that is, all oasis households (71 - 123 households per oasis) were included in the survey. The questionnaires contained questions on demography, housing, migration, activity patterns, income, expenditures, agricultural practices and investment behaviour. The surveys were carried out in the period January-July 1999, taking place at different times in each oasis. The period July-August was used for conducting open-ended interviews with migrants who returned during the summer holidays, and for collecting additional data for the questionnaires. In the period September 1999 - January 2000, an additional plot-level research was conducted, involving interviews with peasants in a specific subsector of the oasis, so as to gain more insight into agricultural practices. In tandem, researchers conducted supplementary research on the so-called Ghallil plain, which has been recently exploited by peasants using water pumping techniques.

In order to analyse the impact of migration, the comparison of migrant and nonmigrant households is essential.⁵ As there are several ways in which households can be involved in migration, the basic migrant/nonmigrant dichotomy seemed overly simplistic. To deepen our insights into migration impacts, four categories of households have been distinguished. These categories will function as a benchmark and serve as a constant source of reference for subsequent migration impact analyses.

Households not involved in internal or international migration are considered *nonmigrant households*, with the exception of households containing international return migrants, or households maintaining any kind of financial bond with international migrants. *Internal migrant households* are households with members currently living outside the oasis in other parts of Morocco.

⁵ For a discussion on the rationale for the choice of a household as a basic unit of research, the definition of households and a migrant typology, see chapter 4.

Two categories of international migrant households have been distinguished. The first category consists of *international migrant households*. These are households that are currently involved in international migration (i.e., with at least one member of the household currently living and working in a foreign country). Households without direct household members living abroad, but which maintain regular financial linkages with other overseas relatives (not part of the household concerned), are also considered as international migrant households. Most typically, this concerns a brother or father sending remittances not only to his own household, but also to other relatives living in their respective households.

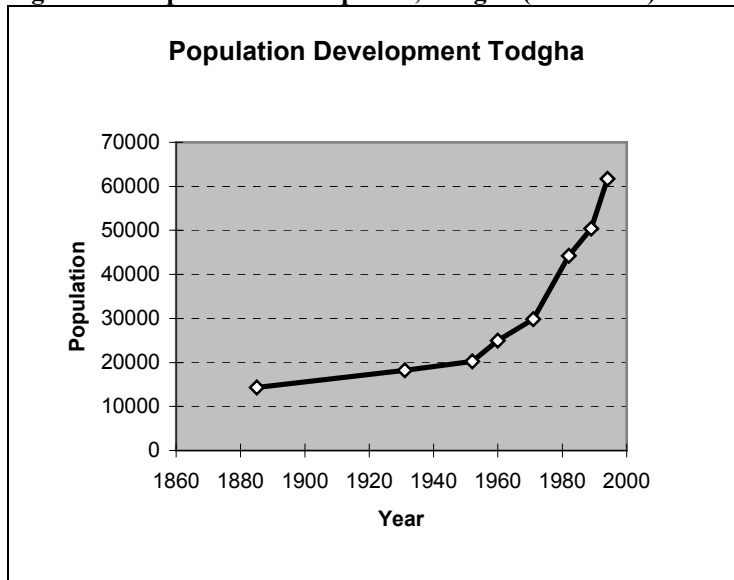
The second category consists of *returned international migrant households*. These are households with at least one member who has been involved in international migration, but who has returned home. As the majority of these returnees still receive money from abroad and have a much better socio-economic position than nonmigrants, they are considered as a separate category. Households containing domestic as well as international migrants were considered as international migrant households. Households containing current international migrants as returnees have been classified as international migrant households.

The research only considered households actually residing in the oasis. Households that left the oasis altogether as a result of family reunification have not been considered. It is important to note that many households have left over the past decade, either to Europe or to Moroccan towns such as Casablanca, Rabat, Meknes, and more recently also Tinghir, Errachidia and Ouarzazate. Although many of these households still possess residencies in the oases to which they may return from time to time, their ties tend to weaken over time and, subsequently, they cannot be considered as being member of the oasis community anymore.

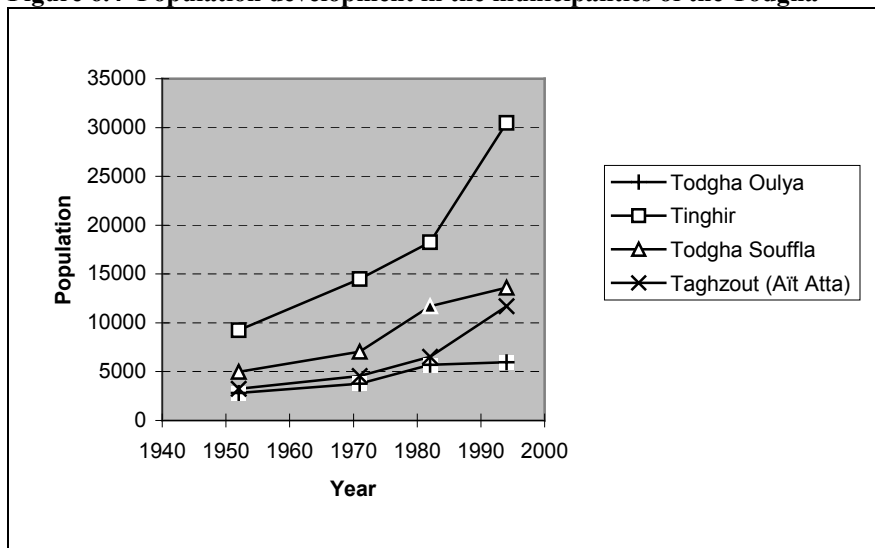
Table 6.1 General characteristics of the research oasis (1999)

Name of Research oasis	Ethnicity	Municipality	Households	Population	Average household size
Zaouïa	Aït Tizgui (<i>mrabtin</i> , some <i>iqabline</i> families)	Todgha Oulya	123	819	6.66
Tikoutar	Ahl Todgha (<i>iqabline</i> and <i>imazighen</i> lineages)	Tinghir	105	730	6.95
Aït El Mesquine	Ahl Todgha (<i>imazighen</i> lineages only, besides recently immigration of some <i>iqabline</i> families)	Todgha Soufla	71	540	7.60
Tadafelt	Aït Atta (<i>imazighen</i> lineages only)	Taghzout n'Aït Atta	116	963	8.30
Total			415	3052	7.35

Source: fieldwork by author

Figure 6.3 Population development, Todgha (1885-1994)

Sources: De Foucauld 1885, Beaupère 1931, National Censuses 1960, 1971, 1982, 1994

Figure 6.4 Population development in the municipalities of the Todgha

Sources: National Censuses 1971, 1982, 1994, Büchner 1986

6.3. Demography and migration

6.3.1. Population development in the period 1950-2000

All four research oases have less than 1,000 inhabitants. The smallest oasis is Aït El Mesquine, with only 71 households and 540 inhabitants. The largest oasis is Tadafelt. Although it has less households than Zaouïa (127), its total population is higher (963 persons), due to its higher average household size. The mean household size tends to be slightly higher in the downstream Todgha oases. In total, 415 households have been included in the socio-economic survey.

With regard to population growth in past decades, some trends can be deduced from general census data at the valley and municipality level. In general, growth figures have been high in the 1950-2000 period (see figures 6.1 and 6.2). The population of the Todgha valley

as a whole has more than tripled between 1952 and 1994. However, important spatial differences can be observed. The extreme growth can be largely attributed to the rapid development of the urban centre of Tinghir as well as the newly developing administrative and commercial centre of Taghzout in the municipality of Taghzout n'Ait Atta, which has attracted immigrants from inside and outside the Todgha valley. Within the oases themselves, natural growth rates have been partially offset by the emigration of households, not only to foreign destinations but also to Tinghir as well as other parts of Morocco. Despite this tendency towards 'creaming off', the population in almost all oases has more than doubled. A population stagnation or even a population decrease, as has been observed in some other Moroccan oases (cf. De Haas 1998), is not taking place.

Table 6.2 Number of households and migration characteristics of the research oases.

		Migration				
		nonmigrant	internal migrant	international migrant	returned international migrant	Total
Oasis	Tikoutar	43	15	30	17	105
		41.0%	14.3%	28.6%	16.2%	100.0%
	Ait El Mesquine	20	8	26	17	71
		28.2%	11.3%	36.6%	23.9%	100.0%
Tadafelt		34	45	33	4	116
		29.3%	38.8%	28.4%	3.4%	100.0%
Zaouia		42	39	23	19	123
		34.1%	31.7%	18.7%	15.4%	100.0%
Total		139	107	112	57	415
		33.5%	25.8%	27.0%	13.7%	100.0%

Source: fieldwork by author

6.3.2. Migration characteristics of research oases

The four research oases differ significantly with regard to their migration characteristics. Table 6.2 clearly demonstrates that Ait El Mesquine is the most migration-affected oasis, with 37 percent of the households currently involved in international migration, and 24 percent of returnee households. That is to say that almost 60 percent of the households is involved in international migration. Tikoutar and Tadafelt have lower migration rates, with 28-29 percent of international migration households. However, Tadafelt shows a very low proportion of international returnees (3 percent), reflecting the more recent character of international migration in Tadafelt. Only 19 percent of Zaouïa's households are currently involved in international migration, but a relative high proportion (16 percent) are household returnees, reflecting its rather ancient migration history.

More than the other oases, Tadafelt and Zaouïa are oriented towards internal migration, with a participation rate of about one third of all households. Tikoutar has a relatively high rate of non-migrant households. This can partially be explained by Tikoutar's proximity to the town of Tinghir, in which many of the oasis dwellers find work. Tikoutar is becoming a more and more integrated part of the urban economic system of Tinghir. As Tinghir is close enough to walk from Tikoutar, the advantages of living in Tinghir are less evident than for inhabitants of more distant oases within the valley.

After Aït El Mesquine, Tikoutar is the second most migration-affected oasis, followed by Zaouïa and Tadafelt, respectively. Generally speaking, the figures confirm the importance of migration in all oases. More than 40 percent of all households have been affected by international and 26 percent by internal migration. That is to say, only one third of all households can be considered non-migrant. These figures correlate with general trends for the Todgha valley. For the entire Todgha valley, De Haas and El Ghanjou (2000) estimated that more than 6 percent of the total valley's population is currently working abroad. The increasingly restrictive immigration regulations of European countries have not led to a dramatic decrease in migration. Although relative migration figures seem to have decreased somewhat compared to the 1970s, the total number of emigrants has continued to increase, reflecting the ongoing nature of the phenomenon.

There seems to be a relationship between the extent to which an oasis is involved in international migration and its general socio-economic status. Table 6.3 lists a number of household socio-economic indicators, such as the possession of televisions, satellites, mopeds and construction materials. In line with their strong involvement in international migration, Aït El Mesquine and Tikoutar reveal the highest score on most indicators. Zaouïa scores high on some categories, low on others. The figures appear to confirm the hypothesis that Tadafelt is the poorest oasis in the sample.

Table 6.3 General socio-economic status in research oases (Percentage %)

	Percentage of households possessing item within each village							
	Tikoutar		Ait El Mesquine		Tadafelt		Zaouia	
	Count	Col %	Count	Col %	Count	Col %	Count	Col %
Television	95	90.5%	68	95.8%	87	74.4%	88	71.5%
Video	37	35.2%	42	59.2%	22	18.8%	37	30.1%
Satellite dish	58	55.2%	34	47.9%	23	19.7%	84	68.3%
Bicycle	51	48.6%	60	84.5%	26	22.2%	42	34.1%
Moped	38	36.2%	47	66.2%	21	17.9%	23	18.7%
Concrete house	69	66.3%	33	46.5%	23	19.7%	67	54.9%

Source: fieldwork by author

6.3.3. Migration destinations

Historical research from various continents has shown that traditional peasant societies are highly mobile (cf. Skeldon 1997: 7-8). This seems also to be the case for southern Moroccan oasis societies, which were not isolated islands in desert seas but integrated into long distance trade networks. As contact zones between different populations and civilisations, oases have probably witnessed strong population movements during their entire history. A quick look at the ethnic composition and population history of oases demonstrates that oasis societies are the very products of migration movements, whereby immigration as well as emigration existed side by side. Migration is definitely an ancient phenomenon in the oasis world. Throughout history, *iqabline*, Jews, Arabs and Berbers travelled to and settled in oases. The last important migration movement in the Todgha is that of the pastoralist Aït Atta tribe which, from their heartland in the Saghro mountains, settled down in the lower Todgha from the late 18th century onward. This migration wave has continued until the present time, as Aït

Atta are still settling as 'frontier farmers' in the Ghallil plain or directly in the new neighbourhoods of Tinghir (such as 'Bougafer').

Besides poles of attraction, oases have also constituted emigration regions since ancient times. Regarding the limited means of existence and high population densities in oasis areas, ancient patterns of seasonal or more permanent migration to other regions in and outside Morocco have been described. Also for the Todgha, the existence of ancient migration patterns to other areas in Morocco has been demonstrated (Büchner 1986). Although international migration is a more recent phenomenon, it did not start in the 1960s and 1970s, but has existed at least since the end of the 19th century. This early international migration was mainly towards Algeria. International migration from the Todgha oases has not come close to diminishing since the 1970s. Instead, each year many oasis dwellers leave their region in search of work in the large Moroccan coastal towns and Europe. Although migration patterns are continually shifting, international and domestic out-migration has been a permanent feature of the Todgha valley during this century (cf. Büchner 1986, De Haas & El Ghanjou 2000).

Until the 1950s, international migration from the Todgha was mainly oriented towards Algeria. Migration in the 1960s and 1970s was overwhelmingly oriented towards France, with a particular emphasis on the city of Montpellier, and to a lesser extent Nice and Paris. Other countries such as the Netherlands and Belgium only attracted a limited number of migrants. The 1980s and 1990s were characterised by a diversification of migration strategies as well as destinations. Although the already established Todgha communities in cities such as Montpellier, Nice, and Paris, continue to attract many 'chain' migrants, and although France is still the main focus of emigration, other destinations have grown in relative importance, such as the Netherlands, Belgium, and more recently, Spain. Despite these general trends, on an oasis level there is a clear differentiation in migration trends.

Emigration from Zaouïa started in the 1950s and 1960s, with migration streams directed mostly at Algeria. The period extending from the end of the 1960s to the beginning of the 1970s was the 'golden age' of migration to Europe, when there were almost no restrictions placed on immigration and French companies were actively recruiting migrant workers in the Todgha. In France they settled mainly in Paris and Toulon. Apart from France, some people left for the Netherlands, Libya and Germany. There is also an important migration to large Moroccan urban areas. In the past, internal migration was largely directed at Meknes. Recently, migration streams have shifted towards cities such as Ouarzazate, Agadir, Marrakech, Rabat and Casablanca. A rather high number of younger people have recently left for northern cities in the Rif mountains region such as Tétouan, Berkane, and Nador, in most cases to work in the construction sector. Many people from Zaouïa possess homes and work in the centre of Tinghir, which is generally too remote to commute to on a daily basis without one's own motorised transport.

As in Zaouïa, international migration from Tikoutar was originally directed towards Algeria, reaching its apex in the 1950s. From the 1960s on, the oasis became heavily involved in international migration to western Europe. Most migrants left for France, heading in particular to the southern city of Montpellier. In the 1980s, family reunification caused the departure of many families from the oases. Compared to the downstream oases of Aït El Meskine and Tadafelt, relatively few people have participated in recent international migration. There seems to be a deep divide in the oasis between richer households who have participated in international migration or are successful in business on the one hand, and households without external financial resources living in poverty. Members of the latter are often employed in the construction sector, either in Tinghir or in other parts of Morocco.

Among all four research oases, Aït El Mesquine is the one most prone to outward migration. International migration to Europe started in the 1930s, but the big exodus took place in the 1960s and early 1970s. Most migrants went to France, although a significant share left for the Netherlands. In the 1980s, family reunification caused the departure of an important share of Aït El Mesquine's population. Many families not directly involved in international migration have close relatives living abroad, and they often receive financial support from them. As elsewhere, though new departures have declined, several oasis dwellers have managed to migrate to Spain in the last two decades, thus maintaining the oasis' culture of migration.

Although Tadafelt did participate in the migration wave of the 1960s-1970s to Europe, it did so to a lesser extent than the Ahl Todgha oases. However, in recent years inhabitants from Tadafelt have shown a greater tendency to migrate than the Ahl Todgha oases with a longer tradition of migration. Many of these recent migrants leave illegally for their new destination countries in southern Europe, particularly Spain. This pattern is reflected in the general migration tendencies of the Todgha, showing a slowing down and consolidation of out-migration in the Ahl Todgha oases, and increasing out-migration from the Aït Atta throughout the 1980s and 1990s. This confirms the general pattern that the Aït Atta are at an earlier phase of migration and are currently experiencing a 'migration hump' (cf. Martin and Taylor 1996), with many people leaving and very few return-migrants. For the same reasons, the migration impact is less profound in Tadafelt than in the other research oases, as migration effects generally grow only over time.

6.3.4. Recent and predicted trends in migration

The persistence of emigration can partly be explained by (partial) family migration and the conclusion of new marriages with the family of acquaintances living in Europe. On the other hand, there has been a considerable increase in undocumented emigration and a shift towards new migration destinations in southern Europe, particularly Spain. These more recent migration tendencies are particularly strong in the Aït Atta oases of the lower Todgha, which participated only modestly in the large-scale labour emigrations to France in the 1960s and 1970s. In this respect, Tadafelt is an excellent example, with several families having migrated to Spain.

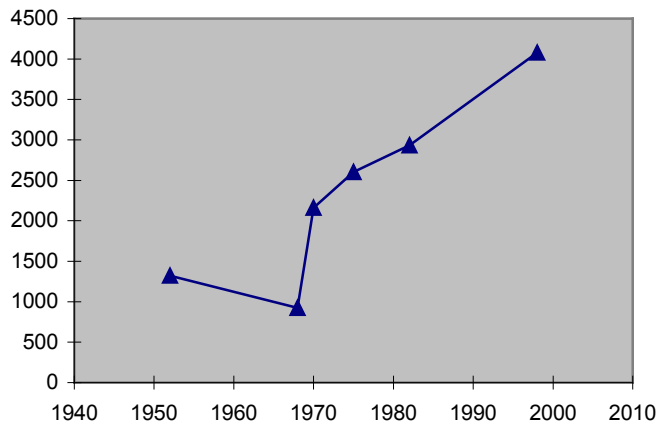
Besides international migration, internal domestic migration, which has an age-old tradition in the Todgha, has remained important, especially for families that did not participate in international migration. Internal migration is the only option for families lacking international networks or sufficient savings required for international migration. It is generally a 'poor man's option'. Most internal migrants work as construction workers in the large Moroccan coastal towns. Others are active in a wide variety of service industries.

Besides the traditional destinations of Rabat and Casablanca, the rapidly developing northern towns of the Rif (Nador, Al Hoceima) have become increasingly important as destinations for internal migrants. The extremely rapid growth of some towns in these northern regions cannot only be explained by the thriving smuggling and drugs trade, but also by the investment remittances of many international migrants originating in these northern regions (cf. Hopfinger 1998, Berriane 1998). As is the case in Tinghir, investments in housing provide important local job opportunities for non-migrants or internal migrants. A distinct group of internal migrants is comprised of students at large universities and highly educated persons who work as civil servants or private-sector professionals.

Although it is difficult to predict the further development of migration patterns, it is clear that the ‘age of migration’ has not yet come to an end in the Todgha. Whether this situation will change depends on future demographic and economic developments. Although the latter factor is particularly difficult to predict, most studies predict that migration pressures in Morocco will probably remain high for the coming decades, at least at levels higher than other Maghreb countries (cf. Giubilaro 1997). Moreover, legal obstacles to entry in Europe only partially influence actual migration patterns, as many migrants cross borders illegally. As long as local job opportunities remain limited, and given the growing ambitions of younger generations, national and international migration from the Todgha is likely to continue into the near future. Schooling and the intrusion of modern media into the valley only seem to reinforce these trends.

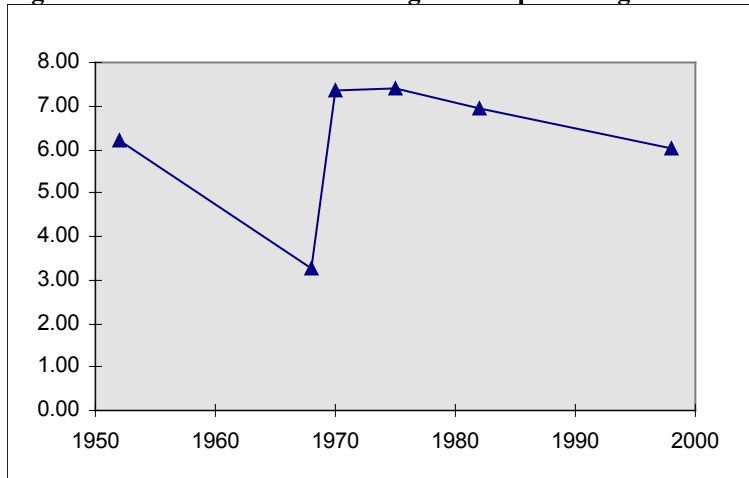
On the other hand, the rapid development of Tinghir is offering more and more local job opportunities and is itself becoming a migration destination. Many non-migrant households are dependent on jobs located in Tinghir. Whether this development in the long term will lead to a decrease in internal migration to other Moroccan regions remains to be seen. For the next few decades, at least, it seems likely that migration will continue to play a very important role in the social, economic and cultural life of the oasis dwellers, as it has done throughout the 20th century.

Figure 6.5 Absolute numbers of international labour migrants in the Todgha valley



Source: National Censuses 1971, 1982, 1994 and Büchner 1986.

Figure 6.6 International labour migrants as percentage of the total population in the Todgha



Source: Beaurpère 1931 and national censuses (1952, 1971, 1982, 1994).

6.4. Agriculture

6.4.1. Land and water resources in relation to agricultural practices

Agricultural practices in the research oases still largely follow traditional patterns involving a high degree of labour-intensiveness, low level of mechanisation, traditional irrigation methods and a generally reduced scale of agricultural production. Extremely small plot sizes, their usually scattered spatial distribution, and the inherently collective nature of resource management in traditional oases, partially explain this low tendency towards the so-called 'modernisation' of agriculture in the traditional oases. However, the apparently stagnant nature of agriculture does conceal important changes in cropping patterns and resource management within traditional oases. Heightened integration into national and international markets, the increased relevance of comparative advantages in a production environment which has lost the imperative of self-sufficiency, all have led to the increasing specialisation of some crops and the decreasing importance or even disappearance of others. In addition to the agricultural changes within the traditional oases, a relatively large-scale agriculture -- based on individualised motor-pumping -- is developing in the formerly desert plains adjacent to the old oases

Within the valley, cropping patterns, agricultural practices, and the nature and scope of recent agricultural changes reveal an important pattern of spatial differentiation, depending on the specific location in the valley. In this respect the difference between the upper and lower Todgha valley is particularly striking. In the upper part of the valley, where Zaouïa is located, water is abundant; proximity to the perennial sources of the Todgha guarantees irrigation all year round. Two small dams (previously three, one for each *âadam*) ensure the supply of water to the irrigation ditches. However, the main problem here is a lack of space. Agricultural extensions are impossible here, and space for housing is even very scarce.

Given the lack of space, agricultural plots are extremely small, hindering any form of mechanisation. Alfalfa, used as fodder, is by far the dominant crop in this part of the valley. In past decades crops such as wheat and barley have entirely disappeared from this part of the valley. This development can be explained in the growing importance of markets and competition originating from other agricultural regions in and outside Morocco, where wheat is produced at a larger scale and without irrigation, hence, at cheaper cost. Within this context of comparative advantages, the production of cereals on very small, often rather obscure plots, is not profitable. In this part of the valley, date palms are not numerous, probably due to the high elevation and, hence, the relative low temperatures in Zaouïa. The dominant fruit trees are olives, in addition to other tree crops such as figs and almonds.

As in the case of Zaouïa, the oasis of Tikoutar is also hemmed in between mountains. Compared with the extreme upstream parts, however, the valley is wider here and agricultural plots are relatively larger in Tikoutar, although they are still too small and scattered to allow mechanisation. Water is less abundant than in Zaouïa, but still sufficient to irrigate all year round, except for extremely dry years. Hence, water pumping is absent in this oasis. Cropping patterns largely reflect those of Zaouïa, with alfalfa constituting by far the dominant crop. In past decades the area covered by cereals has decreased significantly. Generally speaking, cereals seem to be disappearing from the upper Todgha altogether. Only maize -- used as a fodder crop -- persists. Bread beans are also an important winter crop. In this part of the valley, olives and dates are the main tree crops. Virtually all suitable farmland has already been exploited, leaving hardly any space for agricultural extensions.

In Aït El Meskine, located in the lower Todgha, the situation is rather different than in the first two oases. Here water, not land is the scarcest resource. Todgha river water reaches this part of the valley only in winter, and even in that period water availability is very limited. The inhabitants of Aït El Meskine have gone so far as to entirely give up their rights to this water. However, land is relatively more abundant in this wider part of the valley, and plots are sometimes large enough to allow a certain degree of mechanisation. Nowadays, all households make use of water pumping techniques to cultivate their fields. The peasants seem to be increasingly planting almond trees. The primary reason appears to be the high price that peasants obtain on the local market for almonds, and the fact that almond trees demand less maintenance than, for instance, date palms. Moreover, they are well-adapted to dry environments, requiring limited irrigation frequencies. Barley and wheat dominate the fields in the winter half-year and their cultivation largely serves consumption needs.

River water never reaches the Aït Atta oases such as Tadafelt, as only the Ahl Todgha oases have access to this resource. In Tadafelt, agriculture is therefore entirely dependent on the *khattara* irrigation technique. In contrast to many other oases in the region, the *khattara* of Tadafelt is still well functioning, and agriculture in this oasis is still largely based on this traditional water harvesting technique. In past decades, however, water pumping has gained attention, and this phenomenon has enabled the creation of agricultural extensions in the surrounding desert, as well as the more intensive cultivation of plots in the ancient oasis. Cropping patterns are more or less similar to Aït El Meskine, with cereals dominating in winter-time, and dates and particularly almonds as dominant tree crops.

Table 6.4 Cropping patterns on oasis level

	Percentage of households cultivating crops								Total	
	Tikoutar		Ait El Meskine		Tadafelt		Zaouia		Count	Col %
	Count	Col %	Count	Col %	Count	Col %	Count	Col %		
alfalfa	95	91.3%	57	80.3%	92	78.6%	96	80.0%	340	82.5%
wheat	9	8.7%	57	80.3%	83	70.9%	42	34.1%	191	46.0%
maize	67	64.4%	38	53.5%	30	25.6%	20	16.7%	155	37.6%
dates	63	60.6%	64	90.1%	91	77.8%	16	13.0%	234	56.4%
olives	93	89.4%	63	88.7%	87	74.4%	76	61.8%	319	76.9%
almonds	50	48.1%	65	91.5%	90	76.9%	71	57.7%	276	66.5%

Source: fieldwork by author

6.4.2. Cropping patterns

Alfalfa is the dominant crop in the Todgha (see table 6.4). It is particularly prevalent in the upper Todgha, where it has largely replaced wheat in past decades. Although between 80 and 90 percent of all peasants cultivate alfalfa, the surfaces covered by this crop compared to other crops in the upper Todgha are relatively large compared to the lower Todgha, where cereals are still important. Alfalfa is a semi-perennial crop needing relatively large amounts of water almost all year round. Therefore, the upstream parts of the valley are particularly suitable for alfalfa cultivation, as irrigation water is freely available all-year round. In the lower Todgha, the surfaces occupied by alfalfa are relatively smaller, as irrigation water is generally scarcer here, especially in the summer, and often has to be pumped at a considerable price. In the downstream part of the valley, consequently, leaving land fallow is a common

practice in the hot and dry summer season. In the upper Todgha, however, fields are green all year round. As wheat and barley are winter crops, they are still prevalent in the lower Todgha.

As regards wheat cultivation, the data clearly reflect an important difference between upper and lower Todgha oases (see table 6.4). Whereas 70 to 80 percent of the peasants in Ait El Meskine and Tadafelt cultivate these crops, these figures are far lower in Zaouïa and Tikoutar. The few peasants in the upper Todgha who do cultivate wheat do so mostly in other regions. This is so particularly in the case of Zaouïa, where many people possess land in other regions. In the upper Todgha itself, wheat is becoming very rare, and is now virtually absent in the most upstream portions of the valley. In the context of the integration of the region into national and international markets, the cultivation of cereals on extremely small and partially shadowed plots offers few comparative advantages compared to the cultivation of other crops, in particular alfalfa, which responds to the increased importance of livestock breeding.

Maize, the second most important fodder crop, is particularly dominant in Tikoutar and Ait El Meskine, with more than half of all peasants cultivating this fodder crop. In Zaouïa and Tadafelt, a quarter or less of the population cultivates maize. Vegetables such as tomatoes, potatoes and carrots are cultivated on a small scale in all oases, and are largely destined for local consumption.

Only 13 percent of the peasants in Zaouïa possess date palms, reflecting the limited importance of this crop in the uppermost part of the valley. Downstream, its importance is gradually growing. In Tikoutar, 60 percent of the households possess date palms, 78 percent in Tadafelt and 90 percent in Ait El Meskine. Olive trees are abundant throughout the valley, but particularly in Tikoutar and Ait El Meskine, where almost 90 percent of the peasants cultivate olive trees. Oasis-level data also clearly confirm that almond trees are particularly dominant in the lower Todgha valley, and significantly less prevalent in the upper Todgha valley.

Summarising, there exists a clear spatial differentiation in cropping patterns, with alfalfa and olive trees dominating in Zaouïa and Tikoutar in the upper Todgha valley. In the lower Todgha oases of Ait El Meskine and Tadafelt, cereals are still the dominant annual crops. Besides olives and date palms, almonds are the dominant tree crop here.

Table 6.5 Use of agricultural equipment and agricultural capital inputs, oasis level

	Percentage of households using or buying item							
	Tikoutar		Ait El Meskine		Tadafelt		Zaouia	
	Count	Col %	Count	Col %	Count	Col %	Count	Col %
Private pumps	5	4.8%	49	69.0%	20	17.1%	27	22.0%
Collective pumps	5	4.8%	22	31.0%	1	.9%	1	.8%
Use of tractor	3	2.9%	56	80.0%	4	3.4%	9	7.3%
Use of tresher	3	2.9%	56	80.0%	40	34.2%	8	6.5%
Agricultural labourer	40	38.1%	56	80.0%	8	6.8%	58	47.2%
Sharecropper	4	3.8%	11	15.7%	0	.0%	39	31.7%
Purchase fertiliser	19	18.4%	59	83.1%	74	63.8%	18	14.6%
Purchase insecticides	27	25.7%	50	70.4%	28	23.9%	2	1.6%
Purchase olive trees	6	5.7%	62	87.3%	2	1.7%	1	.8%
Purchase date palms	1	1.0%	59	83.1%	2	1.7%	0	.0%
Purchase almond trees	2	1.9%	46	64.8%	1	.9%	0	.0%

Source: fieldwork by author

6.4.3. Cultural techniques, equipment and recent changes in land and water management practices

Table 6.5 clearly shows that agriculture in the lower Todgha, in particular Aït El Meskine, is more mechanised than in the upper Todgha. In Aït El Meskine, the vast majority of households possesses a diesel motor pump. In other oases, these proportions are far lower. The main reason for this seems to be that Aït El Meskine does not receive river water nor exploits a *khattara* such as Tadafelt. More than in the other oases, agriculture in Aït El Meskine is capital-intensive, since without pumps agriculture is impossible here. Likewise, the use of tractors and other modern agricultural equipment is only common practice in Aït El Meskine; here, 80 percent of peasants use tractors to plough at least part of their fields. In the upper Todgha, ploughing is impossible due to the extremely small plot sizes. The only peasants using tractors there do so on land they possess outside the Todgha.

Four fifths of Aït El Meskine households hire paid agricultural labourers at least for some part of the year. This is particularly the case during ploughing and harvest seasons, but some rich oasis dwellers hire labourers for the entire year. In other oases this proportion is much lower, particularly in Tadafelt, where less than 10 percent of households employs agricultural labourers. In the Todgha oases, paid labour more and more is replacing traditional sharecropping arrangements.⁶ Only in Zaouïa a significant part of households (one third) cultivates land under a sharecropping system. This is a unique situation, for many of the 'holy' *mrabtîn* families of Zaouïa possess land in relatively distant places, where they are almost always absent, and for which they show only limited interest. So, most sharecropping arrangements are arranged for land located outside the Todgha valley itself.

As is the case for Morocco in general, traditional sharecropping seems to be gradually disappearing in the Todgha. Absentee landowners, often migrants who left with their entire family, generally prefer to entrust the land to a close family, or to hire labourers, than to enter into sharecropping arrangements. Moreover, the number of people capable and willing to work in sharecropping has diminished significantly as a result of increased job opportunities outside the agricultural sector. The relative scarcity of agricultural labour has led to an increase in the share of the harvest received by the sharecropper from one fifth to one third, and in some cases even higher. Moreover, in the absence of clear land title deeds and formal sharecropping contracts, conflicts between landowners and sharecroppers are frequent, leading landowners at times to fear the property claims of long-term sharecroppers working on their land.

Aït El Meskine is the only oasis where a large number of peasants invest in the purchase of new fruit tree species (in particular almonds). In Zaouïa and Tikoutar these numbers seem very limited, as there is hardly any possibility of extending or intensifying agriculture in the upper Todgha. In Tadafelt, where these extensions are possible, only some peasants actively invest in the purchase of fruit trees. Here, this might be related to the general poverty of the oasis, and the concomitantly low levels of investments to be found there in general.

In the upper Todgha oases of Zaouïa and Tikoutar, agriculture is hardly mechanised, and still follows largely traditional patterns. This seems directly related to extreme small plot sizes and their inaccessibility to machines in this enclosed part of the valley. Moreover, it is impossible to intensify or extend agriculture outside the traditional oasis, as all suitable

⁶ This is the so-called *khammesat*, whereby the sharecropper, the *khammes*, traditionally receives one fifth of the harvest in exchange for his labour.

farmland in the narrow valley has already been intensively exploited. People wishing to invest heavily in agriculture do so at more distant locations.

The situation is different in Aït El Meskine, where capital inputs in agriculture are rather high compared to other sites. It is also the oasis where agriculture is more mechanised than in other Todgha oases. In addition to larger plot sizes, this is due to the non-availability of river -- or *khattara* -- water in this oasis, making agriculture highly dependent on motor pumping. Limited water availability was the primary constraint in the past, forcing peasants to leave land in an uncultivated state. From the 1970s onwards, access to underground water via pumping opened new opportunities for the intensification of agriculture within the old oasis. These investments were apparently enabled by the increasing incomes of many households, mainly derived from migration sources. In Tadafelt, investments in water pumping are less necessary, as its *khattara* is still providing sufficient water. Moreover, lack of financial resources and lower migration levels might play a role in explaining the low proportion of households investing in agriculture.

These findings may confirm the general hypothesis that scarcity of water is not an obstacle for agriculture *per se*. The relevant question seems to be to what extent the resource is accessible, that is, the extent to which the inaccessibility of water is absolute. The situation in Aït El Meskine suggests that water scarcity is not an absolute obstacle to agricultural development, provided that water can be pumped and that sufficient land and investment capital is available. Whether water scarcity might even be a kind of incentive to innovative agricultural practices remains to be confirmed, but the research does not obviate this hypothesis (cf. Boserup 1965). Tadafelt is a particular case, as land is less scarce there and natural water resources are available. Although some affluent households invest in motor pumping and new agricultural extensions around the old oases, the limited availability of investment capital seems to be the major problem here. In Zaouïa and Tikoutar, where water is abundant but land very expensive, and scattered and new land not available at all, agriculture is rather stagnant. Here, agricultural changes are limited to cropping patterns.

6.4.4. Agricultural extensions

Recent agricultural extensions directly adjacent to the traditional oasis only exist in Tadafelt. Their absence in other research oases can be explained by the geographical factor that new, suitable farmland is absent. As agriculture in Aït El Meskine used to be rather extensive, and plots sizes relatively large, many peasants chose to intensify and modernise production in the old oasis. Others purchased land in nearby extension zones, notably in the Ghallil plain. In Zaouïa and Tikoutar, for reasons explained earlier, intensification and mechanisation are virtually impossible. In the upper Todgha, peasants wishing to invest in agriculture are automatically forced to purchase land elsewhere. In the upper Todgha, there is a general preference to buy land outside the Todgha and Ghallil, in the regions of Beni Mellal and Khenifra (west of the Middle Atlas), where land is relatively cheap and the climate more humid, allowing for the extensive cultivation of cereals without irrigation.

6.4.5. Functioning of collective institutions for land and water management

In all the oases, the traditional institutions of the *jemâa* and *amghar* are responsible for the organisation of collective labour necessary for the maintenance of the irrigation system, the distribution of water and the settlement of conflicts between individual peasants, families or

lineages over water or land. The imposition of central state power heralded a new era, in which the traditional political institutions operating on an oasis level -- such as the *jemâa*, which organised oasis life and the maintenance of agricultural and hydraulic infrastructure -- was gradually undermined. The *amghar*, the traditional chief elected annually by the oasis' *jemâa*, has lost his former power, and his directives are less and less respected. Besides the central state's political structures partially undermining the functioning of traditional institutions and the declining dependence of oasis dwellers on agriculture and the local social-ethnic fabric in general, the growing importance of the legal and social-economic emancipation of formerly subordinate ethnic groups, decreasing economic interdependence and a growing sense of 'individualisation' have served to further undermine the position of the *jemâa* and *amghar*.

The status of these functions has eroded to such an extent that it is sometimes impossible to find candidates for this function. For example, this is the case in Zaouïa. Under these circumstances, common law has become increasingly difficult to enforce, and free-rider behaviour by peasants becomes frequent. Increasingly, they refuse to contribute to the maintenance of the collective irrigation system (*khettaras*, dams, irrigation ditches). A decrease in the generalized dependence on agriculture, as well as a diminishing dependence on collective irrigation systems brought on by the rise of pumping, is further reinforcing this tendency towards 'de-collectivisation'. This has fundamental implications for traditional oasis agriculture, particularly for laborious *khettara* irrigation in the lower Todgha.

In most oases, the *jemâa* and *amghar* still fulfil useful roles in regulating land and water management, a situation recognised by the local state authorities, who provide them with some room for manoeuvre. The state only intervenes in cases of harsh conflict which cannot be resolved by these institutions. Nevertheless, they are gradually losing their influence, and their legitimacy is increasingly contested by peasant groups. Traditional institutions, such as the *jemâa* and the *amghar*, are less and less effective in settling disputes between peasants. Likewise, their capacity to impose common law -- such as enforcing payments in the instance of non-participation in collective maintenance works or imposing fines in the case of crop thefts -- is decreasing. Nor have these traditional institutions any control over the developments of agricultural extensions and the installation of motor pumps in the lower Todgha. These new developments are largely taking place in the context of a power vacuum, given that official authorities are hardly intervening.

Many oasis inhabitants express their dissatisfaction with the current situation. They recognise that traditional oasis institutions are not adapting to the changed social, economic, ethnic and agricultural situation. Increasing disputes between peasants and oases over land and water rights, the decline of water works such as the *khettaras*, and an awareness that the anarchical development of motor pumping can have detrimental effects over the longer term, have recently led to the creation of modern village associations in many Todgha oases. This development has particularly gained momentum since 1995, and has been encouraged by increasing civic liberties in Morocco. Most associations are officially recognised by the local authorities.

The main goal of these associations is to acquire funds from the state or non-governmental organisations for the development of infrastructure (roads, dams) in order to attract services (schools, drinking water, electricity) and to stimulate local development in general. In the lower Todgha oases of Aït El Mesquine and Tadafelt, these associations tend to be more agriculture-oriented than in the upper Todgha, where agriculture is generally less important. In the main, the associations seek to re-organise peasants on other, more 'individual' and 'egalitarian' conditions than was the case under the traditional *jemâa* system, in which religious and ethnic hierarchies played an important role. Leaders of these associations are generally young and relatively well educated.

Several associations have been recently successful in obtaining financial support from governmental and non-governmental organisations for various projects, such as the establishment of a drinking water system, the repair of a *khattara*, the establishment of a concrete wall along the river to protect the fields from floods, literacy campaigns and self-employment projects for women. It remains to be seen to what extent these new associations will also play a role in re-organising agriculture, and whether they will be capable of overtaking the role of traditional village institutions, which younger generation frequently criticize as being 'ineffective' and 'non-democratic'. In any case, this spontaneous development demonstrates the willingness of oasis inhabitants to improve their own conditions in and outside agriculture.

6.4.6. The role of the state

In all the oases under scrutiny, the role of the state in agriculture is minimal. The many recent transformations in agriculture -- i.e., the boom in motor-pumping, the change in cropping patterns, the partial mechanisation of the lower Todgha -- are all based on individual initiative. Local authorities do not regulate these developments. Agricultural extension services are generally office-bound, suffer from a lack of funds, seem demoralised and rarely play an active role in promoting agriculture in the valley.

Table 6.6 Percentage of households that contracted bank loans in the period 1975-1998

		Bank loans		
		no	yes	Total
Oasis	Tikoutar	102	3	105
		97.1%	2.9%	100.0%
	Ait El Mesquine	67	4	71
		94.4%	5.6%	100.0%
	Tadafelt	117		117
		100.0%		100.0%
	Zaouia	117	6	123
		95.1%	4.9%	100.0%
Total		403	13	416
		96.9%	3.1%	100.0%

Source: fieldwork by author

6.4.7. Access to agricultural credit and legal structures

Relatively few peasants borrow money from the bank to invest in agriculture; only 3 percent of all interviewed households reported having borrowed money, mostly for the purchase of agricultural equipment or the construction of houses. High interest rates are not the only explanation for the small incidence of agricultural credit. Peasants who invest in agriculture, particularly those not involved in international migration, report that they need such credits but that the bank generally refuses to lend to them. One of the reasons is that most peasants do not dispose of title deeds for the land they claim to possess. Title deeds are generally very difficult or impossible to obtain. This is particularly the case for recently claimed land located

in agricultural extension zones once used as collective pastures, now split up between individual families based on informal agreements among community members and different ethnic groups. Although moral rights to land are recognised by community members, they are normally not formalised, that is, put on paper. This land insecurity is a fundamental obstacle to agricultural investment, a fact reflected in the generalized inaccessibility of credit. In this situation, agricultural investments are only possible in the case of investors disposed of sufficient external income (e.g., migration remittances) as a means to build up private investment capital.

6.5. Migration impacts

6.5.1. General impacts

** Introduction*

In this section, the impact of migration on economic life will be considered. The focus of the analysis here is the difference between migrant and non-migrant households regarding investments in agricultural as well as non-agricultural sectors. Though the analysis is focused on the economic impacts of migration, the impact of migration on the social, cultural, and political domain cannot be neglected, as changes in these domains also influence investment decisions. Changes in local institutions, social and ethnic hierarchies, as well as the ambitions and attitudes of youngsters, may fundamentally influence decisions pertaining to migration, return and investments.

More than 40 percent of all households surveyed have directly or indirectly been involved in international migration. As the region has a century-old tradition of international migration, many families count two, three or even four generations of migrants. Migration has had an important influence on the life rhythm of these families. In the past, the peak seasons for harvesting and ploughing were the Fall and Spring. Nowadays, the yearly economic and cultural peak season is the extremely hot July-August summer holiday period, when migrants return temporarily from Europe. For example, it is during the summer season that most marriages (often between migrants and non-migrants families) are concluded and celebrated, and markets are at their busiest and liveliest.

The regular return of migrant ‘role models’ and subsequent exposure to their relative wealth seem to contribute to the high material and social aspirations of younger generations. The encounter with migrant wealth takes place not only in the summer but all-year-round, as all the oases contain large numbers of households that receive from one or more family members living abroad, forming in turn a kind of new socio-economic elite. In Todgha oases, we can speak of a veritable ‘culture of migration’ that is typical of many emigration regions, in which migration is highly linked to the notion of ‘success’, a fact which explains why most adolescents, men and women – especially the better educated – aspire to leave the Todgha (cf. De Haas 1999). With Massey et al. (1993: 453), we can consider migration as a modern *rite de passage*. Young men are more or less expected to leave for large Moroccan cities or Europe at least for some period of time, and not migrating is the exception rather than the norm.

Throughout the 20th century, migration has constituted the main escape from social failure and poverty, and remains for the unemployed or frustrated youth the most realistic success strategy. Research has revealed that high aspirations, better educational opportunities, and a growing orientation towards migration and material success seem to coincide with a disaffection vis-à-vis traditional agriculture, which remains associated with the poverty of

their ancestors. The following analysis will reveal whether this attitude is reflected in a declining propensity to invest in agriculture.

Table 6.7 Total monthly household income by migration

% within STATMIG3

	Monthly household income in DH					Total
	0-1000	1000-2000	2000-3000	3000-5000	> 5000	
nonmigrant	41.0%	26.1%	14.2%	10.4%	8.2%	100.0%
internal migrant	19.6%	35.5%	15.0%	21.5%	8.4%	100.0%
international migrant	4.5%	17.1%	24.3%	26.1%	27.9%	100.0%
returned international migrant	3.7%	11.1%	16.7%	20.4%	48.1%	100.0%
Total	20.4%	24.1%	17.5%	19.0%	19.0%	100.0%

Source: fieldwork of author (eta = 0.346)⁷

Table 6.8 General socio-economic status and migration: construction material and consumer goods

	Percentage of households possessing item								Total	
	nonmigrant		internal migrant		international migrant		returned international migrant		Count	Col %
	Count	Col %	Count	Col %	Count	Col %	Count	Col %		
Television	101	72.7%	76	71.0%	106	94.6%	54	94.7%	337	81.2%
Video	19	13.7%	14	13.1%	69	61.6%	36	63.2%	138	33.3%
Satellite dish	48	34.5%	40	37.4%	68	60.7%	43	75.4%	199	48.0%
Bicycle	44	31.7%	25	23.4%	77	68.8%	33	57.9%	179	43.1%
Moped	35	25.2%	22	20.6%	52	46.4%	20	35.1%	129	31.1%
Concrete house	49	35.5%	35	33.0%	66	58.9%	41	71.9%	191	46.2%

Source: fieldwork by author

** Impact on income and general socio-economic status*

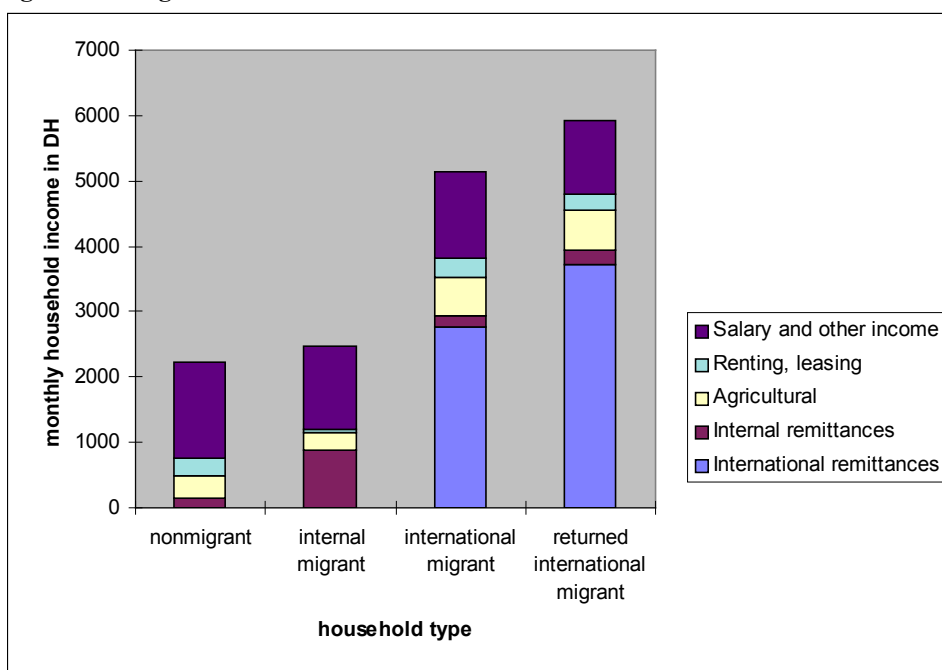
Table 6.7 provides an overview of the monthly household income for different migration categories. This includes internal and international migration remittances, locally earned salaries, income from renting and agricultural income. The table clearly reveals a correlation between migration status and household income. More than half of the non-migrant and internal migrant households earn less than 2,000 dirham per month, whereas more than half of the international migrant households earn more than 3,000 dirham, which reflects remittances sent back by migrants to household members they left behind. The wealthiest group is that comprised of returned international migrants, as most of them have built up pension rights in Europe or receive social security benefits. This explains why almost half of the households in this group dispose of incomes above 5,000 dirham.

⁷ All eta - measures have been calculated using non-classified absolute numbers, with ‘migration’ held as an independent variable.

It is important to take into account that the standard deviation on the mean income for all categories is very high, revealing a high variation in income patterns within migration categories. This variation is particularly high among non-migrants. Although non-migrants households are generally the poorest, it is important to note that within this group almost 20 percent earn more than 3,000 dirham. Nevertheless, more than 40 percent of non-migrant households must live on less than 1,000 dirham per month. Furthermore, there is an interesting 'twin peak' pattern in the income distribution of internal migrants, suggesting that this group is composed of distinctive richer and poorer groups. This 'rich' group of non-migrants consists of local businessmen and civil servants.

The higher prosperity of households involved in international migration is also reflected in the higher possession rates of luxury consumer goods (see table 6.8), such as video recorders, satellite dishes, bicycles, etc. Striking is the absence of significant differences between non-migrant and internal migrant households with regard to these prosperity indicators, reflecting their almost equal mean incomes.

Figure 6.7 Migration and sources of cash household income in Moroccan dirhams (1999)



Source: fieldwork of author

Table 6.9 Investments in housing in and outside the oasis since 1975

	Percentage of households effectuating investments in housing (1975-1998)								Total	
	nonmigrant		internal migrant		international migrant		returned international migrant		Count	Col %
	Count	Col %	Count	Col %	Count	Col %	Count	Col %		
Local housing	67	49.6%	61	58.1%	86	76.8%	50	87.7%	264	64.5%
Housing outside villag	15	10.8%	15	14.0%	30	26.8%	20	35.1%	80	19.3%

Source: fieldwork by author

Table 6.10 Migration and the possession of extra houses

	Number of extra houses in possession			Total
	0	1	2 or more	
nonmigrant	101	34	4	139
	72,7%	24,5%	2,9%	100,0%
domestic migrant	71	34	2	107
	66,4%	31,8%	1,8%	100,0%
international migrant	49	49	14	112
	43,8%	43,8%	12,5%	100,0%
returned international migrant	21	25	11	57
	36,8%	43,9%	19,4%	100,0%
Total	242	142	25	415
	58,3%	34,2%	6,0%	100,0%

source: fieldwork by author (eta = 0.319 and contingency coefficient = 0.351)

6.5.2. Non-agricultural impacts

* *Investments in housing*

There is overwhelming evidence in the scientific literature that international labour migrants the world over tend to give a high priority to investments in housing in their region of origin (Massey et al. 1998, Papademetriou & Martin 1991). Tables 6.9 and 6.10 seem to confirm this hypothesis. Whereas the construction of new, relatively modern houses outside the traditional adobe *qsour* habitat is a general development in the Todgha, the tendency to invest in housing is much higher among households involved in international migration. Whereas approximately half of non-migrants has constructed a new house since 1975, this is the case for over 90 percent of return-migrant households. Investment in housing can be explained primarily by a desire for more convenient living conditions than those in the packed, dark and dusty traditional adobe *qsar* dwellings; as a result, migrants show a higher tendency to construct second or third houses outside the oasis, mostly in Tinghir, but also in some cases within the large cities of Morocco's west coast, notably Casablanca and Rabat.

In most instances, these houses are destined not for self-ownership but as a means of acquiring extra income via short- or long-term leases. In other situations, lots are purchased for speculation. Some migrant households have become very wealthy through the construction of houses for commercial purposes. Data analysis revealed a significant and relatively high correlation between investments in housing outside the oasis (in Tinghir and elsewhere) and income from renting houses ($r^2 = 0.353$), suggesting that housing investments should not only be regarded as 'luxury' investments, but also as investments aimed at generating sources of income independent of external migration remittances.

Table 6.11 Investments in housing construction, by migration category

% within STATMIG3

	Total investments in housing 1975-1998					Total
	no investments	< 50,000	50,000 - 100,000	100,000 - 300,000	> 300,000	
nonmigrant	45.2%	26.7%	11.9%	12.6%	3.7%	100.0%
internal migrant	38.1%	32.4%	16.2%	12.4%	1.0%	100.0%
international migrant	20.5%	13.4%	15.2%	29.5%	21.4%	100.0%
returned international migrar	8.8%	19.3%	14.0%	38.6%	19.3%	100.0%
Total	31.5%	23.5%	14.2%	20.8%	10.0%	100.0%

Source: fieldwork by author (eta = 0.352)

International migrants not only tend to construct more houses than non-migrants, they also spend significantly more on housing (see table 6.11). Most migrant households live in concrete houses, whereas two-thirds of non-migrant and internal migrant households use loam and stone as building materials. International migration has visibly contributed to the accelerated development of habitation in the Todgha valley. Although the construction of new houses is a general development, households involved in migration tend to build better quality homes, and at a faster rate. Housing is the main investment goal of migrants, as it responds to an immediate need for more luxury and space. Investment in housing seems a logical choice, since it is the most secure investment in an uncertain investment climate. Regarding the fast urban growth of Tinghir and Moroccan towns in general, as well as concomitantly rising land prices, this can be a highly profitable strategy. Finally, research has revealed that these investments are considered by their executors as a *de facto* life insurance for their families. In case of the death of the bread-winner, family members are at least sheltered and often gain an additional income in leasing houses.

Table 6.12 Investments in non-agricultural enterprises since 1975

	Percentage of households that invested in sector (1975-1998)								Total	
	nonmigrant		internal migrant		international migrant		returned international migrant		Count	Col %
	Count	Col %	Count	Col %	Count	Col %	Count	Col %		
Coffeehouse/restaurant/l	2	1.4%	3	2.8%	9	8.0%	5	8.8%	19	4.6%
Grocery shop/retail	15	10.8%	12	11.2%	14	12.5%	10	17.5%	51	12.3%
Transport (taxi, van, truc	4	2.9%	4	3.7%	7	6.3%	10	17.5%	25	6.0%
Other business	10	7.2%	5	4.7%	10	8.9%	3	5.3%	28	6.7%

Source: fieldwork by author

Table 6.13 Migration and total non-agricultural investments

% within STATMIG3

	Non agricultural investments 1975-1998				Total
	no investments	< 50,000	50,000 - 100,000	>100,000	
nonmigrant	84.2%	10.5%	2.3%	3.0%	100.0%
internal migrant	81.9%	12.4%	2.9%	2.9%	100.0%
international migrant	73.6%	12.7%	6.4%	7.3%	100.0%
returned international migrant	64.9%	12.3%	14.0%	8.8%	100.0%
Total	78.0%	11.9%	5.2%	4.9%	100.0%

Source: fieldwork by author (eta = 0.199)

5.2.2. Investments in non-agricultural enterprises

One fifth of non-migrant households has invested in non-agricultural sectors outside housing, compared to one third of the returned international migrants. Investments in small grocery shops and other retail activities are most common. Second most importantly are investments in small transport enterprises, such as the purchase of taxis and small vans and trucks, followed by coffee-houses, restaurants and small hotels. In most cases, these investments are made outside the village of residence, notably in Tinghir, and sometimes in other small commercial centres in the Todgha such as Taghzout or the touristic Gorges du Todgha. Some local businessmen and migrants invest heavily in commercial activities outside the Todgha valley, notably in Casablanca and Rabat. In general, the correlation of investment with non-agricultural resources between migrants and non-migrants is smaller than for housing (tables 6.12 and 6.13). Nevertheless, the general tendency is the same, with non-migrant and internal migrant households showing almost no differences in investment behaviour, international migrants tending to invest more than the first two groups, and returned international migrant households showing the highest propensity to invest.

Table 6.14 Percentage of households making capital investments in agriculture

	percentage of households that effectuated investments in agricultural equipme (1975-1998)								Total	
	nonmigrant		internal migrant		international migrant		returned international migrant		Count	Col %
	Count	Col %	Count	Col %	Count	Col %	Count	Col %		
Private pump/well	17	12.2%	16	15.0%	39	34.8%	29	50.9%	101	24.3%
Collective pump/well	8	5.8%	2	1.9%	13	11.6%	6	10.5%	29	7.0%
Purchase tractor	1	.7%	0	.0%	2	1.8%	2	3.5%	5	1.2%
Other equipment	0	.0%	1	.9%	2	1.8%	2	3.5%	5	1.2%

Source: fieldwork by author

Table 6.15 Investments in agricultural equipment and migration

	Investments in agricultural equipment				Total
	no investments	< 50,000	50,000 - 100,000	>100,000	
nonmigrant	116	18	2	1	137
	84.7%	13.1%	1.5%	.7%	100.0%
internal migrant	89	17	1		107
	83.2%	15.9%	.9%		100.0%
international migrant	68	34	3	4	109
	62.4%	31.2%	2.8%	3.7%	100.0%
returned international migrant	28	24	1	2	55
	50.9%	43.6%	1.8%	3.6%	100.0%
Total	301	93	7	7	408
	73.8%	22.8%	1.7%	1.7%	100.0%

Source: fieldwork by author ($\eta=0.232$)

6.5.3. Agricultural impacts

** Investments in agricultural equipment*

The same patterns observed for non-agricultural investments and housing are repeated with regard to agricultural investments. It is striking, however, that the differentials between non-migrant and international migrant households are higher for investments in agricultural equipment than for non-agricultural investments, contradicting the frequently stated assumption that migrant households would have a the tendency to withdraw from local productive economic activities, and that migration remittances would be destined for 'consumptive investments'. Although there is a category of international migrants that more or less abandons agriculture, another group is intensifying and extending agriculture. This is being done in two ways. First, agriculture in the ancient oasis can be intensified. Particularly in the lower Todgha, where natural irrigation water is rather scarce, many migrants dig new wells and install diesel water pumps so as to cultivate all year round. **Table 15** reveals a strong association between migration and the possession of water pumps. Whereas only approximately 17 percent of non-migrant and internal migrant households possess a water pump, 35 percent and 60 percent of international migrant households and returned international migrants do so, respectively.

In the lower Todgha, installing a water pump is only a viable option for intensifying agriculture. In the upstream parts of the valley north of Tinghir, river water is generally so abundant that agriculture all year round is already possible. Here, land, rather than water, is the limiting factor. Available agricultural land is already cultivated so intensively (year round), that space for further intensification is very limited under the prevailing circumstances. Here, agriculture has become the 'prisoner' of the towering mountains hemming in the valley. This explains why, in the upstream oases of Zaouïa and Tikoutar, pumps are rather scarce. Most households possessing pumps use them for domestic use (drinking water) or to irrigate small vegetable gardens within the family compounds.

Investments in motor pumps are particularly intensive in Aït El Mesquine, with the large majority of households possessing motor pumps. We perceive a strong correlation between migration and the possession of pumps, with possession rates varying between 45

percent for non-migrant households and 100 percent for returnee households. Agriculture in this oasis is now almost entirely based on pumped water, which has allowed an intensification of agriculture. This transformation has accelerated due to the fact that Aït El Meskine used to have only very limited access to the river water of the Todgha, rights which have subsequently been relinquished altogether.

In another downstream oasis, Tadafelt, the proportion of households possessing a water pump is much lower (17 percent). This can be explained by two factors; first, the oasis' *khattara* still has an important flow of water, and, secondly, migration is relatively recent in this oasis, with the number of returnees very low. This seems to confirm the hypothesis that non-housing investments occur particularly in later phases of migration, such as is the case in Aït El Meskine, an oasis with a long and intense migration history.

Only 2.5 percent of all households purchased a tractor or other heavy agricultural equipment, notably threshers. Eighty percent of these households are involved in international migration. In the lower Todgha oasis of Aït El Meskine and Tadafelt, most owners rent this equipment to other households, who also use them for threshing cereals (traditional threshing methods using animal traction are hardly used anymore) or for ploughing their land. This provides them with an additional source of income. The same goes for owners of motor pumps, who often rent their pumps to other peasants.

Table 6.16 Land purchase or sale and migration

	Percentage of households effectuating land sales and purchases (1975-1998)								Total	
	nonmigrant		internal migrant		international migrant		returned international migrant		Count	Col %
	Count	Col %	Count	Col %	Count	Col %	Count	Col %		
Land purchase	13	9.4%	9	8.4%	26	23.4%	19	33.3%	67	16.2%
Land sale	10	7.2%	3	2.8%	2	1.8%	6	10.5%	21	5.1%

Source: fieldwork by author (land purchase: $\eta = 0.251$ and contingency coefficient = 0.243; land sale: $\eta = 0.067$ and contingency coefficient = 0.142)

Table 6.17 Migration and investments in land purchase

% within STATMIG3

	Investments in land purchase 1975-1998				Total
	no investments	< 50,000	50,000 - 100,000	>100,000	
nonmigrant	90.6%	4.3%	4.3%	.7%	100.0%
internal migrant	91.6%	7.5%	.9%		100.0%
international migrant	76.6%	9.0%	6.3%	8.1%	100.0%
returned international migrant	66.7%	14.0%	7.0%	12.3%	100.0%
Total	83.8%	7.7%	4.4%	4.1%	100.0%

Source: fieldwork by author ($\eta=0.251$)

* *Purchase of land*

There seems to be a correlation between migration and the purchase of land (table 6.16 and 6.17). One quarter to one third of households involved in international migration have purchased agricultural land, compared to less than 10 percent of non-migrant households. As

for other investment categories, return-migrants reveal the highest propensity to invest. In the case of the sale of land, the relationship is less clear. In general, many more households buy than sell land (16 and 5 percent, respectively), as many households buy land outside traditional oases in the nearby Ghallil plain or in the Middle Atlas. Only a minority of households is willing to sell their land in the traditional oasis, as most inhabitants are emotionally attached to this heritage since the time of their ancestors. Possessing land represents having roots and ‘ancestry’ in the region. This explains the reason why the sale of land is often considered a shame and somehow taboo. Nevertheless, younger generations seem less attached to this land, and a minority of non-migrant households have sold land in order to obtain capital for starting an enterprise, or to buy land elsewhere. In most cases, land is purchased outside the traditional oasis, either in the Ghallil plain and surrounding areas, or in the Middle Atlas. In the first case, the land purchase is accompanied by the purchase of motor pumps; in the latter case, land is used for the extensive, non-irrigated, cultivation of cereals.

Table 6.18 Agricultural labour and migration

	Employment paid labourers and sharecroppers in the year prior to survey								Total	
	nonmigrant		internal migrant		international migrant		returned international migrant		Count	Col %
	Count	Col %	Count	Col %	Count	Col %	Count	Col %		
Family labour	99	71.2%	78	72.9%	89	80.2%	48	84.2%	314	75.8%
Paid agricultural labourer	35	25.2%	25	23.4%	67	60.4%	35	61.4%	162	39.1%
Sharecropper (khammes)	14	10.1%	10	9.3%	18	16.2%	12	21.1%	54	13.0%

Source: fieldwork by author

Table 6.19 Agricultural inputs and migration

	Percentage of households purchasing/using item last year								Total	
	nonmigrant		internal migrant		international migrant		returned international migrant		Count	Col %
	Count	Col %	Count	Col %	Count	Col %	Count	Col %		
Use of tractor	16	11.5%	9	8.4%	29	26.1%	18	31.6%	72	17.4%
Use of tresher	26	18.7%	24	22.4%	39	35.1%	18	31.6%	107	25.8%
Purchase betterave	88	63.8%	71	66.4%	95	85.6%	49	87.5%	303	73.5%
Purchase hey	82	59.4%	83	79.0%	87	79.1%	38	69.1%	290	71.1%
Purchase straw	89	67.4%	80	78.4%	83	83.8%	44	83.0%	296	76.7%
Purchase fertiliser	42	30.4%	38	35.5%	66	59.5%	24	42.9%	170	41.3%
Purchase herbicides	19	13.7%	8	7.5%	24	21.6%	16	28.1%	67	16.2%
Purchase fungicides	14	10.1%	5	4.7%	18	16.1%	10	17.5%	47	11.3%
Purchase insecticides	26	18.7%	18	16.8%	40	35.7%	23	40.4%	107	25.8%
Purchase HYV wheat	17	12.2%	7	6.5%	31	27.9%	18	31.6%	73	17.6%
Purchase HYV alfalfa	44	31.7%	29	27.1%	57	51.4%	31	54.4%	161	38.9%
Purchase olive trees	20	14.4%	6	5.6%	26	23.2%	19	33.3%	71	17.1%
Purchase date palms	15	10.8%	6	5.6%	23	20.5%	18	31.6%	62	14.9%
Purchase almond trees	13	9.4%	4	3.7%	21	18.8%	11	19.3%	49	11.8%

Source: fieldwork by author

** Other agricultural capital inputs and agricultural labour*

As the mechanization of agriculture is virtual absent in the upper Todgha and limited in the lower Todgha, its labour intensiveness is rather high. Most of the daily agricultural tasks (i.e. weeding, harvesting alfalfa, and irrigation) are assumed by family members, particularly women. Three quarters of all households employ unpaid family labour for these tasks. This proportion is slightly higher for international migrants than for non-migrants and internal migrants. Remunerated agricultural labourers are normally only engaged during peak seasons, such as the olive, date (fall) and cereal (spring) harvests, for ploughing, or for special tasks such as the digging of new wells and maintenance work. While approximately only one quarter of non-migrant households employs agricultural labourers for some part of the year, this applies to more than 80 percent of international migrant households. Approximately 20 percent of the latter engaged a sharecropper, compared to 10 percent for non-migrant households (table 6.18).

These figures suggest that international migration does not coincide with a partial or complete retreat of family labour from agriculture, as is often assumed. The family members left behind continue to assume daily agricultural tasks (table 6.18). Their high incomes apparently enable international migrant households to hire agricultural labourers to carry out heavy, typically 'male' tasks or specialist work such as the digging of wells. Migrant households are sometimes forced to hire labourers, as women are generally not allowed to assume several tasks associated with irrigation and machinery. Particularly in the case of investments in surrounding desert plains, it is almost necessary to employ paid labourers. These data seem to firmly contradict the hypothesis that migration generally coincides with a retreat from agriculture. The data point rather to the contrary; provided that family members remain behind, one is devoted to the continuation of agriculture, and the remittances enable migration households to further intensify agriculture. Again, it is the returned international migrants who show the highest propensity to invest.

If we consider other agricultural capital inputs, such as the hiring of agricultural machinery, the purchase of fodder, the use of fertilisers and pesticides, as well as the purchase of HYV seeds and fruit trees (table 6.19), households involved in international migration score significantly higher (often double or more) on almost all categories compared to non-migrant households. Differences between non-migrant and internal migrant households, as well as between international migrants and international returnees, are not significant. Again, higher non-agricultural incomes -- mainly based on international migration remittances -- do not coincide with separation from agriculture, but rather with an increase of capital inputs.

** Cropping patterns*

As relates to cropping patterns, there are no significant differences between international migrant and non-migrant households. Households involved in international migration tend to cultivate a larger variety of crops, but the differences are not very large (see table 6.20). The figures confirm that alfalfa is the most dominant crop in the Todgha, cultivated by more than three quarters of the non-migrant households and more than 90 percent of international migrant households. Households not cultivating alfalfa at all are generally households that partially withdrew from or even abandoned agriculture, indicating that this phenomenon is more frequent among households not involved in international migration. More often, cereals are cultivated by international migrants than non-migrants. This tendency is particularly strong in Ait El Mesquine, where the cultivation of wheat demands important investments in order to pump up irrigation water. Particularly in this oasis, it is the poorest households that

are forced to withdraw from agriculture due to a lack of capital. Also, fruit trees are more often cultivated by migrants than by non-migrants. In other oases, agriculture is less capital intensive, as water from natural sources or *khetaras* is freely or cheaply available.

Data analysis indicates that migration is not significantly correlated with land and water possession. That is, with regards to land and water possession, migration is not selective. This observation is of paramount importance, as it means that the tendency of international migrant households to cultivate more crops and practice more intensive agriculture cannot be explained by a better 'starting position' pertaining to land and water resources. The differences seem therefore primarily related to the higher investment capacity of migrant households, contributing to the intensification of agriculture.

Table 6.20 Cropping patterns, by migration

	Percentage of households cultivating crops (12 months prior to survey)								Total	
	nonmigrant		internal migrant		international migrant		returned international migrant		Count	Col %
	Count	Col %	Count	Col %	Count	Col %	Count	Col %		
	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %
Alfalfa	105	76.6%	82	77.4%	100	90.1%	52	91.2%	339	82.5%
Wheat	45	32.4%	46	43.0%	67	60.4%	32	56.1%	190	45.9%
Maize	55	40.1%	20	18.7%	51	45.9%	29	51.8%	155	37.7%
Dates	63	45.3%	56	52.3%	80	72.1%	34	59.6%	233	56.3%
Olives	101	72.7%	73	68.2%	95	85.6%	49	86.0%	318	76.8%
Almonds	73	52.5%	72	67.3%	86	77.5%	44	77.2%	275	66.4%

Source: fieldwork by author

Table 6.21 Marketing of crops and migration

	Percentage of households marketing crops during the last 12 months								Total	
	nonmigrant		internal migrant		international migrant		returned international migrant		Count	Col %
	Count	Col %	Count	Col %	Count	Col %	Count	Col %		
	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %
marketing wheat	5	3.6%	4	3.7%	9	8.1%	8	14.0%	26	6.3%
marketing dates	17	12.3%	4	3.7%	8	7.3%	1	1.8%	30	7.3%
marketing olives	10	7.2%	8	7.5%	18	16.5%	5	8.8%	41	10.0%
marketing almond	36	25.9%	35	32.7%	59	53.6%	23	41.1%	153	37.1%

Source: fieldwork by author

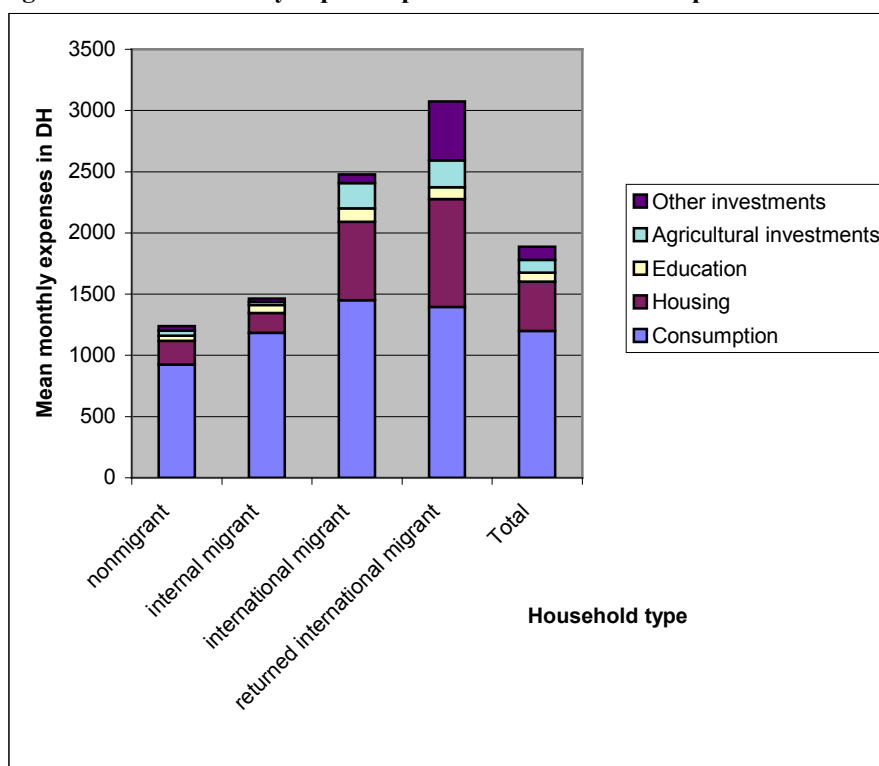
** Agricultural outputs and the marketing of crops*

Agriculture in the entire Todgha valley is still mainly directed for self-consumption. Its important function for household economies should not be underestimated, however. Particularly in the lower Todgha, many households produce an important share of their daily needs of cereals, vegetables and dairy products themselves, reflecting an ancient ideal of self-sufficiency, still prevalent among many peasants. In a region that has historically been

characterised by a limited means of existence, famines, sieges and attacks, securing one's own food production logically has a high priority. Nevertheless, research revealed that younger generations adhere less and less to the ideal of self-sufficiency, and there seems to be a certain tendency towards the increased marketing of crops. Table 6.21 lists the main crops sold on the local markets in Tinghir and Taghzout. Crops such as alfalfa, maize and vegetables are almost uniquely destined for self-consumption.

The figures make clear that the marketing of agricultural product crops is not very common. However, there are exceptions for some crops, especially for almonds, which form the only genuine cash crop in the Todgha. Particularly in Ait El Meskine and in the agricultural extension zones of the Ghallil, agricultural investments and motor pumping largely concur with new almond plantations, specifically oriented to production for market. More than half of international migrant households, and over 40 percent of the returnees, produce almonds for market. This is far removed from the image of a 'ritual' or 'sentimental' agriculture, to which (returned) international migrants would tend according to some studies in other Moroccan regions (cf. Bencherifa 1991, Bencherifa & Popp 1990, De Mas 1990). Also, in the case of wheat and olives (for oil production), international migrant households tend to market more than non-migrants.

Interestingly, for dates this correlation seems exactly the opposite, as more non-migrants market dates than international migrants. In the Todgha, the date palm, a typical and traditional oasis tree, used to be much more important than it is now. In most Todgha oases, their number is declining compared to other tree crops. Their cultivation requires a specialist knowledge, which is gradually disappearing. It may be that poor, non-migrant households are more traditionally oriented, and subsequently more oriented towards the cultivation of traditional crops. However, this hypothesis needs further analysis to be confirmed. Modernising peasants often consider date palms as unimportant, and often do not maintain them properly, causing severe production decline and making their quality unsuitable for marketing.

Figure 6.8 Mean monthly expenses per household on consumption and investments**Table 6.22 Summary: Migration and investments in housing, agricultural and other sectors**

	Percentage of households effectuating investments 1975-1998								Total	
	nonmigrant		internal migrant		international migrant		returned international migrant		Count	Col %
	Count	Col %	Count	Col %	Count	Col %	Count	Col %		
Housing	74	54.8%	65	61.9%	89	79.5%	52	91.2%	280	68.5%
Non-agricultural enterprises	27	19.4%	21	19.6%	31	27.7%	19	33.3%	98	23.6%
Agricultural investments	27	19.9%	25	23.4%	50	46.3%	33	60.0%	135	33.3%

Source: fieldwork author

Table 6.23 Total amount of all investments and migration

% within STATMIG3

	tal investments (agricultural, non-agricultural, housing) 1975-1998					Total
	no investments	< 50,000	50,000 - 100,000	100,000 - 500,000	100,000 - 200,000	
nonmigrant	68.7%	20.6%	4.6%	6.1%	1.9%	100.0%
internal migrant	64.8%	29.5%	2.9%	2.9%	1.9%	100.0%
international migrant	43.9%	30.8%	3.7%	19.6%	1.9%	100.0%
returned international mig	27.3%	34.5%	12.7%	18.2%	7.3%	100.0%
Total	55.3%	27.6%	5.0%	10.6%	1.5%	100.0%

Source: fieldwork author (eta = 0.241)

Table 6.24 Measures of association between key variables

	Migration status (eta measure)	Household income (pearson's correlation coefficient r)
Household income	0.346	----
Number of houses	0.319	0.270 **
Investments in housing	0.352	0.295 **
Investments in non-agricultural enterprises	0.199	0.123 *
Investments in agricultural equipment	0.232	0.217 **
Land purchase	0.251	0.148 **
Land sale	0.067	0.032
Number of cows (all breeds)	0.336	0.334 **
All investments	0.241	0.222 **

Source: own calculations based on fieldwork author (* = two-tailed significance at the 0.05 level; ** = two-tailed significance at the 0.01 level)

6.5.4. Synthesis

From the preceding analysis it becomes evident that, in general, international migrant households tend to invest more frequently than non-migrant households, regardless of the investment category. Table 6.22 summarises the proportion of households investing in the following main categories: housing (in and outside the oasis), non-agricultural investments in enterprises, and agricultural investments (purchase of land and equipment). The data reveal that migrant households do not only invest in housing or purchase luxury goods. Whereas only one third of non-migrant households has invested in economic activities outside housing, more than half of the international migrants and almost three quarters of the returned international migrants do so. It is striking that internal migrants hardly invest more often than non-migrants. This is probably related to the fact that the mean household income of both groups is almost equal. Among international migrant households, the tendency to invest is highest among returned international migrants. The investment category with the highest differential between migrant and non-migrant households is agriculture. Only 20 percent of non-migrant households, compared with 60 percent of returnee households, has invested in agriculture. In non-agricultural investments, the differential is smaller.

There seems to be a direct relation between the higher incomes of migrant households and their higher propensity to invest in agriculture. Table 6.24, which summarises correlations between key variables, confirms the high importance of this income-effect. It is mainly through this effect that migration enables investments. This seems to justify the conclusion that migration, through its important income effect, is not causing agricultural decline, but is instead enabling agricultural investments, contributing to and accelerating the transformation of traditional oasis agriculture (e.g., the growing importance of motor pumps, partial mechanisation, increasing use of fertilisers and insecticides, the growing importance of paid labour and a modestly growing orientation towards the market). Moreover, there is a significant correlation between migration, income and the possession of cows, the latter being increasingly fed with purchased fodder, in addition to the alfalfa which peasants traditionally cultivate themselves. Though these changes are rather slow and sometimes partial, a clear transformation is occurring in which migration remittances play an important role.

It should be stressed that not all migration households have invested in agriculture. Many migrants have actually retreated from agriculture. In that case, they generally entrust their land to (poorer) family members. This explains that migration-induced abandonment of land is not a common phenomenon. It is important to observe that it is not uniquely migration households which invest in agriculture. Current shifts in cropping patterns and the rise of

motor pumping are partially related to general political and economic changes, and cannot be attributed to migration alone.

However, the role of migration remittances has been highly important in providing the necessary capital for agricultural investments. The installation of a motor pump, the digging of a well and land purchase involve financial risks most non-migrant households cannot afford. Migration remittances have enabled peasants of the lower Todgha to make the transformation to motor pumping, and to significantly extend the irrigated agricultural surface of the Todgha. In this way, the management crisis which the traditional *khettara* system has suffered has not led to the large-scale abandonment of land through water shortages. On the contrary, analysis of aerial photographs reveal that agricultural production has significantly expanded and intensified since the 1960s.

6.6. Conclusions

6.6.1. Propensity to invest of migrant versus non-migrant households

Migration has seriously affected all research oases, since one to two-thirds of all households are engaged in international migration. Data analysis reflects that households participating in international migration are much more inclined to invest than non-migrant households. Although the propensity to invest is higher among international migrants in general, the figures are highest for returned migrants. Between internal migrants and non-migrants, there is hardly any difference, either pertaining to income or to investments. They are low for both groups. There appears to be a direct relationship between the much higher mean incomes migrant households earn and their higher propensity to invest. However, despite these clear differences, it should be noted that investment and income patterns are not uniform: variation within groups is very high. However, the income effect of migration is very important and cannot be underestimated.

The most widespread investments are in the construction of houses. Since 1975, more than 80 percent of international migrant households have invested in this domain, compared to about 40 percent for households not involved in international migration. Moreover, general housing expenses are much higher among international migrants, indicating that they are constructing larger and more luxurious cement houses, and in many instances they possess more than one house. The construction of houses is generally the first investment made once a certain capital has been saved. Viewing the primitive living conditions in the traditional adobe *qsar* habitat, this seems a logical choice. Moreover, housing can be seen as a relatively secure investment in a rather insecure investment environment, generating a relatively stable income through various lease arrangements. The indirect economic consequences of these housing investments should not be underestimated, as many non-migrants themselves work in the local housing sector, suggesting that the migration-propelled housing boom has had important multiplier effects for the local economy.

Besides real estate, international migrants also tend to invest more than non-migrants in other economic sectors. This provides evidence to contradict the thesis that migrants tend to 'withdraw' from the local economy, depending solely on migrant remittances. Although a certain category of migrant indeed exhibits such behaviour, this is not true for the group as a whole, which tends to invest more in the local economy and sets up relatively more commercial activities than non-migrants, which, again, provide work for non-migrants. A relatively large difference regarding investment in the agricultural sector is to be found between non-migrants and migrants, where the latter tend more clearly to buy land, dig new

wells, purchase motor pumps, purchase fertilisers and cultivate fields more intensively than the former.

6.6.2. Conditions for investments in agriculture

Within the specific geographical context of the Todgha, conditions for agricultural investments differ significantly depending on the exact location of investments in the valley, reflecting the general pattern of Moroccan oases. Differences seem particularly related to scarcity of water and land, two variables that are negatively correlated. In contrast to what one might expect, in the Todgha oases water scarcity is less an absolute problem than scarcity of new agricultural land, at least on the short term and at the local level. Nowadays, the water scarcity problem can be resolved through pumping, provided that sufficient capital to purchase and operate a motor pump is available. Migration has often provided this capital via remittances. As in older oases, plots are often too small and scattered, and the collective, community-level organisation pertaining to water distribution is very complex and increasingly considered hindering individual agricultural entrepreneurship.

In this context, most peasants prefer to invest in new, formally pasture land in the desert plains adjacent to the old oases. The variability in land scarcity explains why agricultural investments are more common in the lower Todgha. In this part of the valley, the possibilities for intensifying agriculture in existing oases are better, as plots are larger, which allows for some degree of mechanisation and a more 'modern' farming system. Moreover, barren land is available here, a resource which is increasingly exploited by peasants. In the higher Todgha oases, where water is abundant but land is scarce, migrants tend to invest less in agriculture. The minority who do so in some cases make these investments in the lower parts of the valley, but more frequently in other parts of Morocco, in particular in the extensive rain-fed cereal agriculture of the Middle Atlas.

There seems to be considerable potential for investment in agriculture in general, especially when sufficient capital is available. As migration remittances are the most important source of stable cash income for many households, without migration most of the investments in agriculture would have been impossible. Nevertheless, there is ample evidence that there are still many factors that seem to obstruct investments in the agricultural sector.

First, extremely small plot sizes and their scattered location hinder agricultural innovation in the old oases. Peasants willing to invest are therefore forced to buy land elsewhere, requiring considerable extra investment. At first sight, a re-allocation of land seems highly desirable, and this is also a wish expressed by peasants themselves. However, the extremely complex functioning of collectively managed land (under the jurisdiction of traditional village institutions such as the *jemâa*), as well as the complex relationships and rivalries between families, ethnic groups and oases in different parts of the valley make such operations extremely difficult, and can only be successful with the highly sensitive intervention of the state, while taking into account the opinions and wishes of oasis inhabitants.

Secondly, the relatively abundant and perennial river water seems disproportionately allocated to the upper parts of the valleys, depriving the lower parts of the valley from this cheap and renewable water resource. Nowadays, oases located in the upper Todgha valley have a disproportionate claim on irrigation water, which seems to stimulate water wastes, while downstream oases suffer from water shortages, and are forced to invest in pumping. Easier access to the irrigation water of the Todgha would lower the investment load required for agriculture in the lower Todgha, stimulate agricultural development, and at the same time decrease the need for water pumping, and, hence, enhance the sustainability of water

exploitation. On these grounds, there is much to say for a revision of the current water distribution arrangements. Under a new regulation, oases should be distributed water according to the size of their agricultural land. This would imply a fundamental change in the current water distribution, as the lower Todgha oases have much larger agricultural areas. Again, such a redistribution would be very difficult to implement voluntarily, as upstream oases would certainly oppose to this. Moreover, in most oases, land possession is linked to water rights at the individual level at least to a certain degree, making such an operation even more complex. Also in this case, a sensitive, responsive state intervention is needed.

Characteristic of current land and water distribution in the ancient oases seems to be obstacles to agricultural innovation and increased investments in the ancient oases, causing the stagnation of agriculture and the partial reallocation of investments to other regions of Morocco. Despite these obstacles, many peasants continue to make agricultural investments, especially in the lower Todgha. In the present context, agricultural development almost invariably requires rather large sums of money to be invested in the purchase of land, pumps and other equipment. This explains why it is sometimes the poorer households in the lower Todgha that are forced to partially or entirely abandon agriculture, as they cannot afford the costs of pumping. Moreover, the risks of these agricultural investments are high, as the availability of groundwater is not known prior to investments due to the non-availability of detailed hydrological studies, and insurance against such risks is virtually impossible.

In the context of the poverty in which many rural households live, and the limited possibilities to gain a high local income, the lack of sufficient capital to make investments in agriculture seems to be the greatest obstacle towards agricultural innovation. In the absence of accessible credit or government support for small peasants, migration is the main strategy to overcome these constraints, as it provides a relatively stable source of external income. Its role should therefore not be underestimated. Nevertheless, if constraints on capital availability would be alleviated, more non-migrant households would be able to invest in agriculture as well. Finally, if the river water from the Todgha was more abundant in the lower part of the valley and the *khettaras* preserved, the general cost of agricultural enterprise would be further lowered, increasing the attractiveness of agriculture for entrepreneurs, and enhancing the sustainability of agriculture. Essentially, the same argument would follow in the re-allocation of land resources.

Summarising, the largest obstacles to agriculture investments are to be found in limited access to land in the upper Todgha, the high cost of pumping water in the lower Todgha, and the near inaccessibility of credit markets for small peasants who aspire to invest. Another factor that might play a role is the very limited knowledge peasants have regarding the modern agricultural techniques contributing to increased water use efficiency, as well as higher harvests. On the longer term, falling water tables – caused by excessive pumping -- might increase the cost of water pumping, gradually decreasing the attraction of agriculture. In these domains, state intervention, aimed at preserving *khettaras* and re-distributing land and water, would be desirable.

6.6.3. Underlying factors of spatial variability

It is evident from the preceding analysis that the spatial variability of agricultural development is mainly determined by the following factors: relative water scarcity, relative land scarcity and income as a source of investments. The latter partially determines the extent to which households invest in agriculture, with high-income households investing much more in agriculture than lower income households. In the upper Todgha oases, where water is

abundant and land scarce, and innovation is almost impossible due to obstacles related to the fundamental 'collectiveness' of agriculture, investments in this sector are rare. In these oases, agriculture is largely traditional with regards to its inherent low capital-intensiveness: as mechanisation is virtually impossible here, almost all tasks are done manually. As water is available almost "for free", almost no peasants have abandoned their fields, as has been observed for other oases in the Maghreb -- as in the Bani region -- which are often less well endowed with water resources and where most peasants do not have sufficient capital to invest in motor pumps (Bencherifa 1993, De Haas 1998).

Given the limited freedom of individual action, there is only a modest difference between migrant and non-migrant households regarding cropping patterns in traditional oases, with a general tendency towards the gradual disappearance of cereals, to be replaced by alfalfa in the upper part of the valley. The cultivation of cereals on extremely small-size and partially shadowed plots offers few comparative advantages as compared to the cultivation of other crops, in particular alfalfa, which responds to the increased importance of livestock breeding.

In the lower Todgha, more capital investments are generally required to gain access to motorised pumping, and more land is available for agricultural investments. This explains why, in this part of the valley, differences in cropping patterns between migrants and non-migrants are much larger. As they dispose of sufficient investment capital, households involved in international migration show a higher propensity to invest in agriculture than non-migrants. These investments are changing the agricultural landscape of the lower Todgha, with an increasing stress on motor pumping and almond cash cropping.

To conclude, the preceding analysis reveals that, in the absence of functioning credit markets for small peasants, the disposal of relatively high and stable self-generated income is a necessary but not sufficient condition for agricultural investments. A second necessary condition is the availability of suitable farmland to make such investments. An absolute lack of new farmland can be a serious obstacle to such investments, a factor leading to investment in agriculture elsewhere in Morocco (Ghallil, Middle Atlas) or in other economic sectors. Water is less of an absolute obstacle, as it is available throughout the valley, in all oases, although at varying costs. In the lower Todgha, where land is less scarce, agricultural investments are much higher than in the upper valley. It is not so that investments are particularly located in water-rich parts of the valley. The paradox is that most agricultural developments are taking place in those parts of the valley where water is scarcest.

6.6.4. Recommendations

In theory, the re-allocation of land resources in traditional, water rich oases would be an important stimulus for the relatively stagnant agriculture in these areas and would increase the use of existing agricultural infrastructure as well as abundant and renewable water resources. In any case, any re-allocation should be done in close consultation with the population of the oases, and should take into account the position of the various actors often having contradictory interests, and should preferably be based on voluntary, negotiated agreements. However, as has been argued, the actual implementation of a re-allocation scheme will be extremely difficult and seems hardly realistic without the highly cautious, sensitive, and comprehensive intervention of the state.

A re-distribution of water resources from the Todgha River can entail huge gains for agriculture in the lower Todgha, while only modestly affecting agriculture in the upper part of the valley, which currently faces a situation of over-irrigation, causing huge water losses. A

redistribution in favour of lower Todgha oases will decrease the necessity for water pumping and would therefore contribute to the long-term sustainability of agriculture. The construction of a valley-long *séguia* (irrigation ditch), which would guarantee river water distribution along the Todgha valley, has been envisaged in a pilot study (Margat 1953, Energoprojekt 1968, Büchner 1986), but never implemented. The extreme complexity of intra-valley and inter-oasis ethnic and political relations makes such an operation extremely difficult and delicate.

A more active role on the part of agricultural extension services and local authorities is desirable, in cooperation with new local organisations willing to re-organise the ancient oasis, re-establish *khattaras* and other traditional techniques. A particular field of concern should be the *khattaras* themselves, which are currently declining in number. As it concerns a traditional technique of water harvesting that has proved highly effective, low-cost and sustainable, it is worthwhile to take measures to preserve these techniques. In the past, some *khattaras* in the Todgha have been successfully restored as a result of actions by agricultural extension services in Ouarzazate, by covering the underground tunnel by cement, or by inserting cement pipes, which greatly reduced the need for maintenance of tunnels and renders vertical shafts superfluous.

Many peasants willing or making agricultural investments suffer from a deficient knowledge concerning modern and water-saving irrigation techniques (such as drip irrigation), new crop varieties and horticultural techniques. In this context, a more active role on the part of agricultural extension services would be highly desirable. Past interventions have often not been successful, as their 'high-tech' developmental agendas did not correspond with the knowledge, ambitions, and agendas of peasants. This led to disappointment and frustration among agricultural officers, their decreasing presence in the field, and a lack of confidence among peasants. Currently, agricultural officers are almost uniquely interested in a small number of relatively big farms in the Ghallil plain, which represent 'real' agriculture in their eyes. 'There is no agriculture in the Todgha', is a cynical remark all too commonly heard.

The Moroccan central government tends to consider oases, especially those that are located outside the Drâa and Tafilalt oases, as 'marginal', which explains the absence of an active agricultural policy there. Current agricultural transformations in the Todgha (i.e., the intensification and extension of agriculture), is entirely the result of the individual efforts of peasants, where the state does not play any role at all. A more active involvement of the state might be beneficial, for example, in the transfer of knowledge, assisting peasants in case of crop disease, or the digging of wells. Given the proven potential of dry-land agriculture in many other countries (Algeria, Tunisia, Egypt, Israel, US), the relatively high water-availability in southern Morocco compared to other arid regions in the Maghreb (Zaimeche 1992), and the willingness to invest among many peasants, a more active role of government - - responding to the peasants' needs and problems -- might have considerable pay-off.

Difficult access to agricultural credits is another obstacle for households aspiring to invest in desert agriculture. This is especially true for non-migrant households, which generally do not have access to a sufficiently large, stable income to make investments, even if they possess enough land. Difficult access to agricultural credit is partially related to the fact that most peasants do not possess title deeds for their land, documents which are acquired with great difficulty from local and provincial authorities. As banks require title deeds as a collateral on loans, the absence of title deeds seems another impediment to investments. This is especially true for former collective pastureland in the lower Todgha (notably the Ghallil plain) that has been divided between individuals on the basis of mutual but unformalised agreements. Formalising land possession and better land security could further incite people to invest in agriculture.

Several other measures are conceivable to enhance investments by migrants, and agricultural investments in general, but they lie beyond the scope of local and provincial authorities. Examples of measures taken in other countries which might also contribute to further agricultural development in the Moroccan desert include the creation of small-scale agricultural investment funds; the facilitation of national trade networks easing the marketing of crops from desert regions; the creation of better linkages with national and international markets (such as is the case for dates in Tunisia and Algeria); and the stimulation of small-scale agricultural cooperatives.

Finally, it is essential to obtain better knowledge concerning underground water resources. Although hundreds of peasants use underground water resources for irrigation, there are no hydrological studies available necessary for estimating whether current developments will lead to the gradual depletion of water resources. Moreover, many investments are currently being lost, as peasants tend to dig wells without any prior knowledge of the depth of existing water tables. In some cases, they do not find any water at all, as aquifers tend to be located at varying and difficult to predict depths, particularly in the lower Todgha valley. In order not to endanger the sustainability of agriculture -- and to avoid current investments being undermined in the long term -- an integrated, comprehensive policy from local authorities and agricultural extension services aimed at studying the hydrological characteristics of the Todgha basin, combined with regulation of the current 'anarchic' motor pumping, is highly important.

