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# Market Integration and Food Security in the Moroccan Mountains

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## Introduction

In the High Atlas mountains of Morocco, the largely self-sufficient agro-pastoral economy of the past is all but gone. The terraced fields, the intricate network of irrigation canals, and the arrangements of labour division and rotation that had made them sustainable for centuries have changed in appearance and in meaning. Most families have abandoned cereal farming and transhumant livestock breeding altogether. Over the past three decades, they have gradually replaced these occupations with market-oriented fruit production, activities in mountain tourism, and various types of wage labour (Breuer et al. 2011). As a result, locals today sell the fruits of their agricultural production or their labour force in order to provide their families with food.

The High Atlas participates in a bundle of processes that touch and alter very different parts of the globe in similar ways and are in part promoted by technological developments, in part by political decisions. In this paper, we want to look at this globalisation from the perspective of market integration, i.e. the general intensification of economic ties with more numerous and more distant actors.

It should be noted that this region represents a specific environmental setting that is of global importance. Due to their delicate human-environment balances, mountain ecosystems are among the sites that are most susceptible to climate change. At the same time, they promise to point out pathways toward more sustainable practices in scarce environments. Given a growing world population and pressing questions of food security, the lessons that can be learned from people in mountains, including the Berbers of the High Atlas, seem very valuable.

## Material and Methods

Based on a large-scale household survey and ongoing empirical research we have carried out in the High Atlas municipality of Asni, Morocco, this paper addresses some of the profound shifts the local production system has undergone and discusses their likely consequences on food security for the local population.

The socio-economic household survey at the core of this study was carried out in 2009 by a Moroccan-German team of researchers. The sample consisted of 557 households in 22 selected villages, covering 40% of the total population in each village. In addition, a census of the entire area was carried out twice, in 2009 and 2012, where basic data on all families in those villages were

gathered from key informants. This basic set of standardised data was complemented by qualitative surveys, cartography work, interviews, and focus group discussions on a range of topics.

We divided the study area into four zones with distinct characteristics:

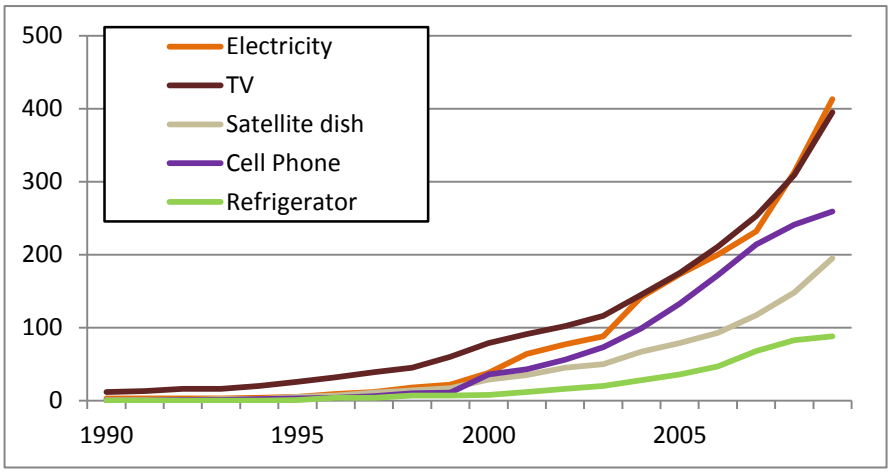
1. Asni is located in a comparatively low altitude range (1.100-1.500 m above sea level) and has an increasingly urban character, with employment opportunities concentrated in the construction, trade, and services sectors.
2. People in the second zone, Imlil (1.600-1.950 m), mostly subsist on fruit production and tourism. European hikers headed for the Toubkal, North Africa's highest summit, usually start their tours here.
3. The neighbouring Imnane valley (1.800-2.350 m) has only recently been involved in the introduction of fruit trees and the development of infrastructure such as roads and electricity. A general aspiration to 'catch up' with the lower zones seems to be prevalent.
4. Oussertak (1.700-2.200 m), finally, is the most remote inhabited area in the Asni municipality and still maintains a strong pastoral and agricultural character.

**Results and Discussion**

The traditional agricultural system of this area is characterized by the cultivation of barley, corn, vegetables for household consumption, and walnuts that grow near the irrigation canals. Small livestock (sheep and goats) are raised in a transhumant system that includes communal summer pastures in high altitude areas. A generation ago, 87% of the region's families practiced agriculture and 51% raised livestock. Today, the percentages are lower: 75% and 43% of the household heads in our sample, respectively, are still farmers and herders. As the available labour force per household is limited, redirecting it into other activities implies a decline in the agricultural productivity of a household.

The emerging production system is highly integrated with economic forces outside the region. Elements of the traditional system are combined in various ways with remunerated activities as mountain guides, construction workers, or day labourers. Half of all families, in our sample, have at least one member who works in non-agricultural wage labour. In contrast to other Moroccan regions, however, international migration does not play a significant role in Asni. People who migrate for employment reasons tend to move to major Moroccan cities instead.

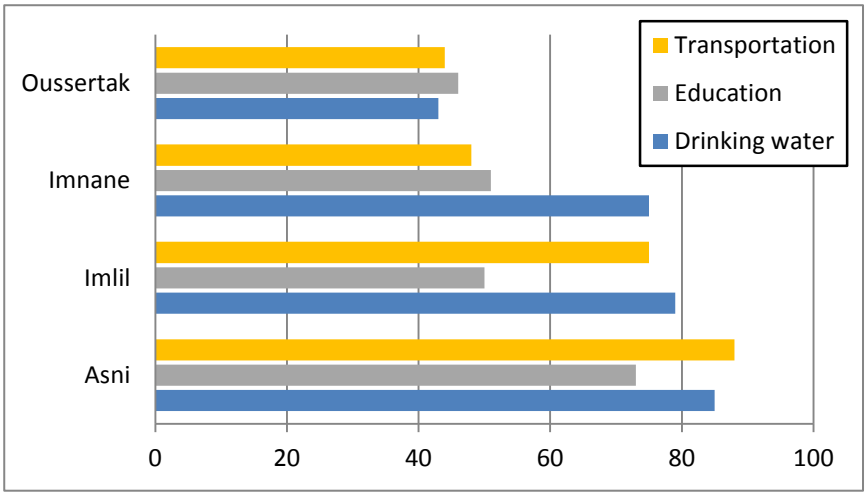
These new economic arrangements have performed well so far. Cash incomes and better access to ever-expanding basic infrastructure have improved living conditions, health indicators, and educational opportunities for many families in the area. The first graph shows how electrification and the perpetration rates of technological devices went up in the 2000s; they have now reached large segments of the population in the Asni municipality.




**1 Number of households that have access to technology (n=557, by year)**

With regards to food security, we asked respondents to evaluate the quality of available food; 70% stated it had increased over the past five years (2004-09), while 3% noted a decline.

It is instructive to look at this most vulnerable group: these families are predominantly located in the urbanising zone of Asni, own less apple trees on average than other families, cultivate significantly less barley, and consist of fewer adult men per household. They are thus deprived of the two main sources of cash income (fruits and wage labour) and produce hardly any food for their own consumption.




**2 Percentage of household heads who see an improvement over the past five years in different areas (n=557, by zone)**

The overall positive evaluation of recent trends linked to market integration includes the access to drinking water, education, health care facilities, and public transport; the answers are differentiated by zone, as the second graph shows. Satisfaction levels are highest in central Asni and lowest in remote Oussertak. With regards to family income, there is a pronounced polarisation among residents of the Asni zone: in our survey, 15% of them said that their income situation had worsened while 53% stated that it had improved. In Oussertak, the majority of 57% reported an unchanged income.

All in all, life has become easier for many inhabitants of the lower-altitude, urbanising areas; but at the same time, a part of the population there reports deteriorating living conditions. This could be due to relative poverty: as people around you achieve positive change, your own position, though unchanged, seems less attractive (Stark 1984). However, we argue that polarisation and food insecurity are real and need to be addressed.

The intensity as well as the sheer number of socio-economic links from the Asni region to distant places has multiplied with market integration. These can take the shape of a young villager working on a construction site in Casablanca, of a tourist couple booking a room at a local lodge, or of political news reaching a young girl in the region via her smart phone. As these connections become intimately embedded in everyday lives, processes at those distant places have immediate effects on the ground in the High Atlas. Yet, despite the gradual transformation of lifestyles, people's access to markets remains asymmetrical. It has, therefore, introduced new risks and vulnerabilities even for families who are better off. Four examples illustrate this.

First, the market price for apples dropped substantially in 2014/15 and although the harvest was good, farmers in Asni were not able to sell their crop as expected. Most small producers rely on intermediaries who buy the (unharvested) apples as standing crops. When the intermediaries fail to show up, people cannot sell their harvest and lose out; only a small proportion of the apples can be consumed by the villagers themselves.

Second, the number of tourists who bring cash to the mountains is directly linked to the perceived security situation in other parts of North Africa. The number of visitors to Morocco stagnated in the wake of the September 11, 2001, attacks and again during the economic crisis of 2008. When the Arab Spring flared up in Tunisia, on the other hand, Morocco actually benefited, its tourism figures kept climbing and crossed the 10 million visitors mark for the first time in 2013 (World Bank 2015). On the local level, tourist flows are not controlled by locals either. People who work in this sector depend overwhelmingly on tour operators who bring tourists in; locals function as mere subcontractors, be it as mountain guides, cooks, or muleteers.

A third example concerns imported staple foods needed by the families. Their purchase price is increasingly subject to financial flows and political decisions which are made in remote locations. This global tendency is set to increase as a consequence of free-trade agreements between Morocco and other countries. Similar developments can be observed regarding fuel, where price controls by the state have recently been relaxed. As fuel prices become more closely coupled with world market developments and fluctuations, the potential effects on the local population in Asni are severe.

And fourth, social institutions of mutual aid and solidarity within the villages have been weakened along with the decline of traditional forms of land use. This decline was already observable in the 1980s (Miller 1984). Nevertheless, new forms of solidarity have since appeared, mainly in the form of local development associations. The question is whether all households enjoy equal access to such new institutions; while this is given in theory, anecdotal evidence shows that some benefit much more than others and the NGO sector is contributing to processes of stratification and polarisation. This goes together with a wide-ranging monetarization. In some villages, the traditional system of rotating irrigation rights is defunct; people now pay for water according to their consumption. A formerly abundant collective good is thus being transformed into a tradeable property. Due to climate change – an increasing frequency and severity of dry years is expected for the High Atlas – and the ongoing development of touristic facilities, water will probably become scarce in the future. This would raise further delicate issues of competition and conflict management.

## Conclusions and Outlook

While climate risk does play a role in the Moroccan mountains, the main threat to food security today is the unreliability of cash income caused by the locals' dependence on global markets. First symptoms of such a development are already observable.

Market integration concerns both the production and the consumption of food in this region. Since this integration is irreversible, Moroccan state agencies, international organisations, and NGOs should assume more responsibility in buffering market-related income risks by providing adequate forms of social security or insurance products. On the production side, opportunities for the commercialisation of local products need to be improved to make market integration more equitable. The creation of effective self-organisation platforms for producers would be a step in this direction.

Only one in four household heads in our sample want their children to stay in the village when they grow up. This attitude could perhaps be changed by subsidizing traditional modes of production and the conservation of local knowledge, especially in high-altitude zones. Emphasizing the cultural dimension of these land-use practices also seems promising for local agro-pastoral production and ecotourism, as it could open up alternative marketing channels by establishing labels and certifications. In analogy to the Causses and Cevennes region in France, the High Atlas could possibly be declared an 'Agro-Pastoral Cultural Landscape' and enlisted as a UNESCO World Heritage site (Mahdi 2015). If several of these strategies are combined, there is potential for a sustained improvement of livelihood and food security in the region.

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