

Testing the Rhomis household tool to assess the contribution of animal husbandry to improving livelihoods in the Tinghir province (Center East Morocco)

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1. Introduction

The activity systems of the Maghreb hinterlands are based on a strong integration and complementarity of agricultural and livestock activities on a territorial scale, in particular through the mobility of herds. All these activities also produce economic (market or consumed) and non – economic (knowledge, culture, etc.) goods, which are pillars of the social and economic sustainability of these systems. However, approaching living conditions of household farms who live off the livestock income in dryland areas still face research challenges in link with the multiple roles of livestock as safety capital and productive asset and the permanent changing of animal asset (due to the dynamic of animal population within and between the households) and the set of complementarity activities like crop or off farm activities. The present research work proposes to analyze the diversity of livelihood strategies of household farm oriented to livestock using a set of data collected in the dryland areas of the mountainous zone of Morocco. Overall, this research study aimed also to conduct a methodological reflection on taking into account the herd-mobility in the approach of living conditions by using the Rhomis survey toolkit (Rural Household Multiple Indicator Survey) in order to adapt this toolkit to agro pastoral and pastoral systems and address the complexity of livestock contribution.

2. Materials and Methods

The RHoMIS (Rural Household Multiple Indicator Survey) tool is a farm household survey that can be conducted on a digital platform using tablets or mobile phones with the Open Data Kit (ODK) type of software adapted to Android-based mobile phones or tablets (Hartung et al., 2010; Hammond et al., 2017). The survey is a structured questionnaire that provides comprehensive information on standardized performance indicators concerning agricultural production, nutrition, food and poverty. These indicators make it possible to characterize and grasp the situation of vulnerability of rural households while taking into account indicators concerning the preservation of the environment. The final objective is to be able to have a common tool that can be deployed on a large scale to constitute a database according to standardized criteria and thus facilitate comparison between different areas in the context of development actions. It has already been tested in several countries with different agro-environmental contexts, like in Tanzania, Guatemala, El Salvador and Honduras. For each of these survey areas, the questionnaire was adapted to the characteristics of the agricultural population (Hammond et al., 2017). In our research, this survey tool has been adapted and implemented for pastoral and agro-pastoral areas in Morocco. The field study has been conducted in March 2020 in Tinghir province (Center East of Morocco) over 36 family farms with a livestock activity, mainly sheep and goat flocks.

The specific objective of this study was to address the main components of the pastoral and agropastoral systems in the livestock module that can influence the living conditions of households. For that, we have conducted a Multiple Factorial Analysis (MFA) on 8 groups of variables called ‘themes’ that reflect: 1. Human capacity; 2. Physical assets (mainly land and livestock); 3. Diversification trends (crop system, livestock species and off farm activity); 4. Mobility capacities (description of the grazing practices); 5. Capacity of financial exchanges (debt, loan, and gift); 6. Living conditions (related to the Poverty proxy Index in Morocco); 7. Livestock management, and 8. The location (reflecting the geographical constraints). This MFA allowed us to analyze the links between the main capacities in link the capacity (themes 1 to 5) (active variables) with the living conditions, livestock management and location (supplementary variables in themes 6 to 8).

3. Results and discussion

The first plan of the MFA (representing 21.3% of the variability) allowed us noticing a strong link between the physical assets (land and livestock) and the diversification strategies, confirming that the capacity to develop multiple activities is strongly linked to the initial endowments (Figure 1). We observe also the distance between physical assets and the human or social capacity through financial exchanges, demonstrating that social and financial exchanges are more embedded in the human factor than physical endowment in this zone. Figure 1 also shows that the herd-mobility is not directly linked to the physical assets or human capacity, but this practice involving different living pattern is linked to the living conditions. So the living conditions are at the interaction between three categories of capacity: human and social capacity, endowment and herd mobility capacity. This explains the complexity to approach the herd-mobility. In the same way, livestock management is more linked to human and social capacity due to experience and financial exchanges than the herd size and structure.

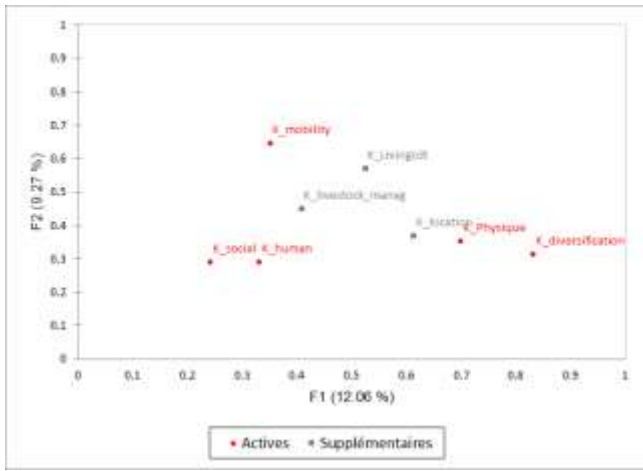


Fig 1. Factorial plan (F1*F2) of the multiple factorial analysis conducted over 70 variables grouped in 8 themes and 36 household farms in the Tinghir province (Morocco)

Based on the coordinates of individuals on the three first factors of the MFA, we carried out an ascendant hierarchical classification based on the Ward method. Four main types of livelihood strategies were identified and they are presented in Table 1. We can easily distinguish the pastoral system (T2 without owned land) from the agro-pastoral system (T1) that are the most endowed and have developed off farm activities. Two rural systems (T3 and T4) are also identified according to livestock development and cultivated land areas.

Table 1: Typology of livelihood strategies (st.) in the Tinghir province (Morocco)

Types	T1	T2	T3	T4	All
Values	Agro-pastoral system based on diversification st.	Pastoral system based on livestock investment	Small family farm based on off farm activity st.	Integrated crop-livestock farming systems based on integration st.	Total average
Sample size	16	7	5	8	36
Household size (number of persons)	9	13	6	11	10
% persons living out of the residency	2.3	1.7	0.8	1.9	1.9
Number of active male	1.9	1.4	0.8	1.3	1.5
Number of women involved in the mobility task	0.9	2.0	0.2	3.3	1.5
Owned land area (ha)	1.0	0.0	0.8	0.3	0.6
Cultivated land area (ha)	1.0	0.0	0.8	0.3	0.6
Camel (number)	0	3	0	0	1
Cattle (number)	2	3	1	0	1
Sheep (number)	221	350	34	83	189
Goats (Number)	137	236	0	79	124
Grazing distance (km)	278	301	0	3	183
Grazing practices (months/year)	12	10	3	10	10
Off farm source income (%/sample)	38	0	20	25	25

4. Conclusion

These preliminary analyses allow us to have a sound understanding of the diversity of family farms systems in the zone in link with their living conditions. The results show that livestock activity plays an important role in the living conditions especially for the agro-pastoral and mixed crop-livestock systems which allows them face shocks and develop off farm activities. Contrary to our first hypothesis, the herd mobility is not the prerogative of pastoral or agro-pastoral system with a large flock; it depends also on human capacities (mainly experience and family size) and it is embedded in a specific living patterns.

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References

Hammond, J., Fraval, S., Etten, J. van, Suchini, J.G., Mercado, L., Pagella, T., Frelat, R., Lannerstad, M., Douxchamps, S., Teufel, N., Valbuena, D. and Wijk, M.T. van. 2017. The Rural Household Multi-Indicator Survey (RHOMIS) for rapid characterisation of households to inform climate smart agriculture interventions: Description and applications in East Africa and Central America. *Agricultural Systems* 151:225–233.

Hartung, C., Lerer, A., Anokwa, Y., Tseng, C., Brunette, W., Borriello, G.: Opendata kit: tools to build information services for developing regions. In: *Proceedings of the 4th ACM/IEEE international conference on information and communication technologies and development*, p. 18.