Saharan pioneer front in Algeria: does the concept of resilience make sense in a context of rapidly expanding profitable agriculture?

Ali Daoudi*†1 and Caroline Le Jars*‡2

1Ecole Nationale Supérieure d’Agronomie d’Alger (ENSA) – avenue Hacène Badi, 16200 EL Harrach, Alger, Algeria
2Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD) – Centre de coopération internationale en recherche agronomique pour le développement [CIRAD] : UMRGeau, Centre de coopération internationale en recherche agronomique pour le développement [CIRAD] – 42, rue Scheffer 75116 Paris, France

Abstract

In Sahara, intensive groundwater use has allowed the development of new agrarian dynamics. In Algeria, through traditional oases were in difficulty, some Saharan wilaya became the hope of agriculture. During the 1980’s, in these regions, the government launched pilot projects in intensive agriculture, especially in cereals, following the California and Saudi model (Cote, 2002). Private investments were also encouraged through a law facilitating access to land ownership (the law of the APFA 1983). New agrarian dynamics such vegetables crops under greenhouses started to appear. In the 1990’s, despite the failure of large cereal farms model, the government has continued to make significant investments for the development of different Saharan wilaya (agricultural and rural electrification, opening roads and farm tracks, drilling programs, etc..). In the early 2000s, the dynamics of these territories were consolidated by the national plan for rural development (NADP) (Hartani et al. 2011). Biskra is one of the wilaya where neo-Saharan agriculture has known a remarkable development. Vegetable crops under greenhouse combined with traditional palm trees have developed and expanded rapidly on new land. Through experts have predicted a rapid decline of this Saharan agriculture, the high profitability of plasticulture still allow not only diversification of crops systems but also expansion of palm trees (Amichi, 2012). This pioneer front remains a pole of attraction for private investors and Algerian farmers.

In this study, led in the municipality of El Ghrouss (wilaya of Biskra), we discuss and analyze how this socio-ecological system (SES) adapt to both internal and external perturbations. We show that the robustness of this SES, ie ”the capacity of the system to maintain performance when subjected to internal and external perturbations” (Janssen and Anderies, 2007), is largely made possible by complex relationships between actors, both at farms and collective level. At farms level, the relationships between actors are analyzed through agrarian contracts and show that these contracts enable the expansion of the oasis and allow the upward social mobility. At collective and public level, the relationships between users and

*Speaker
†Corresponding author: daoudinf@yahoo.fr
‡Corresponding author: caroline.lejars@cirad.fr
resources providers are analyzed through the framework proposed by Anderies et al (2004). The evidence confirms, in large part, the proposed hypothesis of Anderies et al (2004) assuming that "the link between resource users and public infrastructure providers is a key variable affecting the robustness of Sess". The complex relationships between actors, both at farms and collective level, reconfigure the institutional framework governing the use of groundwater resources.

Despite its significant growth potential, this new Saharan agriculture raises many questions about its sustainability, especially because of groundwater overexploitation. In the long term, robustness and resilience of this new agriculture is difficult to measure. Similar study cases in the world raise similar challenges, particularly in terms of collective management of groundwater resources when water availability reaches a critical threshold.

Keywords: groundwater, crops under greenhouse, resilience, robustness, Saharan pioneer front, Biskra, Algeria