

A NEW READING OF THE ANIMAL PRODUCTION SUBSIDY PROGRAM FOR THE SAHARAN REGIONS: OPPORTUNITIES AND CONSTRAINTS

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↳ Supporting Information

ABSTRACT: Like in other Saharan regions, the Animal Production Subsidy Program has increased the herd in Ghardaïa. The creation of breeding farms in such areas has generated specific dynamics through a set of measures that have had different impacts on the components of this sector. The data from the guides addressed to the various stakeholders illustrates that the management of the breeding farms presents shortcomings at different levels and even compromises its sustainability. In our model, around 49 % of farmers are renting their farmland, while 51 % are managing their own land. A significant portion of breeders (approximately 75.88 %) expresses the view that the main obstacle hindering the progress of these treatments is the insufficient availability of outreach programs. Applying this management results in young breeders abandoning the farms and using them for other activities. As a solution, the government must revise its agricultural programs and investments in order to achieve the long-term development goals that have been set. The measures to be taken are discussed to preserve the sector and explain the substantial investments made by the public authorities.

Keywords: Agricultural policies, Algeria, Animal production, Breeding farms, Saharan region, Subsidy program.

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INTRODUCTION

In the Saharan region, various agricultural reforms and policies (socialist era) have discarded family farms in agrarian development (Baci, 1999; Abdelhedi and Zouari, 2020; Baghdad, 2022). So, the agricultural sector remains the third sector of the economy in terms of value-added formation (Djaafri and Abdelli, 2019). It represents 9.2% of the Gross Domestic Product, which does its ranking after the hydrocarbons (38%) and services (21%) sectors (Bedrani, 2008). In addition, it fulfills only 25% of the employment needs of 42% of the total labor force (Bensaha et al., 2015).

Bensaha et al. (2013) stated that, to implement this program was a decisive stage in the history of agricultural policies in Algeria; it promoted the role of the farmer as an active economic player. Moreover, the program mutated the traditional relationship between the farmer and agricultural administrations into a confident, responsible, and cooperative relationship (Adrian and Green, 2001).

So, these policies proved to be efficient ways to achieve higher production levels, mainly regarding food security (Dhehibi and Lachaal, 2006). For this reason, the government implemented a policy of aid and support for the agricultural sector by creating the National Fund for the Agricultural Regulation and Development (FNRDA) in 2000, with the objective to reduce the importation of foodstuffs and ensure the food security of the country (Benyoucef, 2005). However, food production has never satisfied domestic needs due to the scarce studies investigating the implemented profitability and sustainability strategy (Forbord and Vik, 2017; Govindan, 2018).

The incentive agricultural system has witnessed various revisions. The new subsidy system has been implemented in 2000, it aimed to improve the expansion of private investment in agriculture through the instauration of new economic supports and the encouragement of aggregation.

A significant proportion of "young" farmers and a territory in which agricultural activities occupy an important place a priori reflect a region where the agricultural sector is important, which would be rather favorable to an increase in milk production. According to MADR (2018), another strategy was fostered between 2000 and 2018, called the National Plan for Agricultural and Rural Development (NPARD), where a substantial budget of 350 billion Algerian dinars (DZD) was granted and 14 billion of the debts were annulled for the farmers. However, the exported agricultural products only increased by \$ 3 billion in 2003, \$ 8 billion in 2008 and \$ 11 billion in 2011. Moreover, Thabet et al. (2002) found that approximately 80% of food subsidies went to urban areas, at the expense of the rural ones, despite the fact that more than 40% of the Algerian population lived in rural areas. This showed that food subsidies were ineffectually administrated and unequally distributed between rural and urban consumers. Therefore, specific policies had been implemented to secure the supply of food and create wealth and labor opportunities through the use of the natural resources: arable and range lands, animal wealth and irrigation water. However, in the absence of public policies tradition assessment in

Data sources and estimation procedure

In order to carry out the annual data on the value of projects number by activity, investment amount, jobs, and overlapping percentage are subjected to be investigated. Data collection is based on the responses of the farmers, on our own observations and on farm records if they exist, as well as on engineers from the Agricultural Services Direction. It is based on an analysis of the database provided by the Agricultural Services Direction (DSA) of Ghardaia region. It registers the exploitations received from the state aid under the agricultural development fund. This database contains several projects presented at this program (2005-2018). Our efforts are focused on monitoring and evaluating the physical implementation rate of the subsidized projects. The results are compared with the referred objective. The size of the sample, which is admittedly small, helps to carry out an adequate detailed analysis of the practical situations. Data processing is conducted through a descriptive analysis via XL-Stat.

Brief overview of the subsidy program: dynamic trigger

The agricultural policies of the last thirty years have been marked by a clear liberal orientation and a frank choice for the development of Saharan agriculture, which is considered as an essential part to solve food dependency problem of the country (Mutin, 2000). These agricultural policies have contributed to lifting the constraints of access to productive resources and have significantly boosted agricultural development in some areas of the Sahara, as is the case in the region of Ghardaia. The Algerian government has long given priority to the development of the rural sector. It allocated a significant portion of the planned investment budgetary funds to it. Thus, many milestones at the institutional, legislative, regulatory and organizational levels have been settled to pave the way for the gradual and harmonious achievement of sustainable development.

As a reminder, the program is based on three pillars, namely:

1. Increased food supply and reduced hunger.
2. Agricultural research, extension and adoption of technologies enabling sustainable growth in production.
3. Sustainable development of livestock, fisheries and forests.

Development programs also address socioeconomic imperatives. In short, it is about improving the incomes of farmers and the fight against poverty (Khiati, 2007). It also includes close extension and technical support programs for farmers, involving specialized technical institutes, the local agricultural administration and chambers of agriculture. According to Maghni (2013), the primary purpose of the new policy is the national food security and revitalization of rural areas.

In 2021, the Minister of Agriculture noted that: “Bureaucracy is the first obstacle that the farmer faces in Algeria”. Our study shows that, it is necessary to improve administrative procedures, where large farmers more easily put together the files to apply for a subsidy. Also, used to establishing oral contracts (informal land and water markets), smallholders perceive the use of written documents as a cumbersome and time-consuming process; it is also necessary to call on someone well-informed and to commute to various administrations. To cope, such the government is preparing to launch a new financing mechanism for farmers, while promulgating an instruction to simplify the procedures for obtaining credit (Figure 2). The services of the agricultural sector are currently working on the creation of new financing mechanisms in favor of farmers in order to revive agricultural activity and finance all sectors.

The Bank of Agriculture and Rural Development (BADR), which is responsible for supporting farmers, examine the obstacles that compromise obtaining credit for a short period. At the same time, the conditions of access to the subsidy are simplified by the creation of a one-stop shop. Nonetheless, the gaining of subsidies and farming strengthening did prove successful due to the intermittent of actions in time and space. The outcome of the current study indicated that farm improvement policies in drylands should be compliant and account for the heterogeneity of agriculture, in particular socio-economic factors.

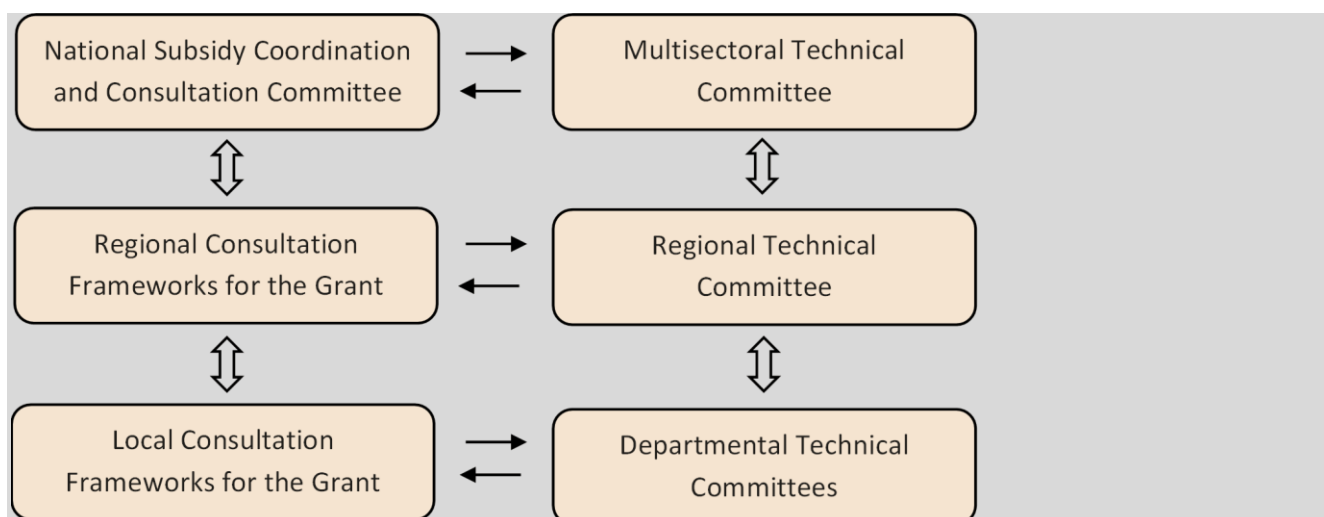


Figure 2 - The key steps for applying for and obtaining a subsidy

RESULTS AND DISCUSSION

Integration of young people and availability of the workforce

Agricultural employment poses a dilemma for policy makers in Algeria (Bensaha et al., 2015). In the current global context, family farms represent more or less 1.4 billion people, and 96% of family farms are sited in southern countries (Ferraton and Touzard, 2009).

As discussed in Figure 3, the common age of farmers receiving aid in our study is 40 years, and the excessive standards ranged from 20 to 70 years. Approximately 49% of farmers in our model are tenants, and 51% operated their own farmland. The latest overall employment situation contributes to the diminution of the joblessness rate by 9% in rural areas and 6% in the area. The employment rate Feminine represents 13% in the rural setting, mainly crafts and small livestock, and 10% in the municipal environment, particularly in the administration. At present, the employment tendency recorded during the period (2005-2018) remains not worth mentioning in view of the growth of the rural workforce predictable at 7%, even though the number of farms augmented by 4.66% but they are mostly small (51% with an area of less than 3 ha), which is shaped as a single unit occupied by a single employment post, with low returns and incapable to turn out the minimum essential for the safeguarding of families; agriculture remains a less critical and seasonal activity for a considerable part of the agricultural population.

In this organizational context, the countryside employment condition in the Ghardaia region is similar to the common of Saharan areas, which is characterized by the dim training of the workforce, the lack of an alteration of farmers in old age, poor integrating circumstances of agricultural institutions and organizations (30% adhering to the Chamber of Agriculture, 16% insurance, 5% to both at the level of institutions and organizations bank and represented only by 5 associations of low activity), these are young investors, university graduates, the beneficiary of the aid program. They employ one or two permanent workers in order to free themselves up for farm management tasks. This wrong observation reflects the fact that the Algerian labor market is characterized by early-life migration from the countryside to metropolitan areas, many leaving agricultural farms in the hands of women and elderly workers.

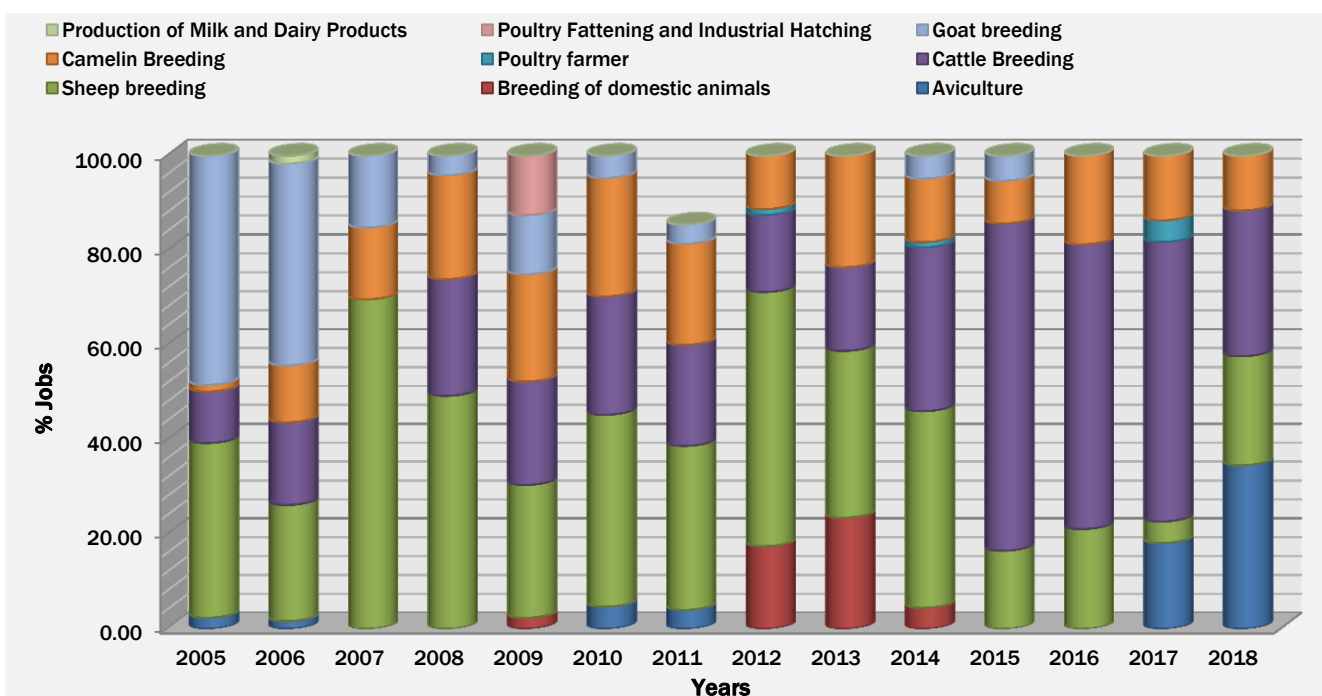


Figure 3 - Integration of young farmers in the sector

The number of projects by activity and the investment: dynamic trigger

Starting from the purpose of the subsidy program is to progress the farming and living standards of countryside populations (Bensaha et al., 2013). As well as, an immense flow in food demand has surfaced (Lampietti et al., 2011), mainly in animal products (meat and milk), implying, as in many other developing countries the need for a "Livestock Revolution" (Delgado, 2003). These programs have also powerfully supported the renewal and industrialization of the farm animals' sector and have motivated the start-up of livestock production farms (Figure 4).

As shown in Figure 4, many reported operator's loans receiving support through the PNDR program. This need for external financing is explained by the significant cost of activity financing and by the vast sum that is necessary to start a new farm. This has been combined with the fact that breeding in Ghardaia has breathed new life into Saharan agriculture by allowing the diversification of agricultural production systems and the extension of other speculation. According to Daoudi and Lejars (2016), the development of animal husbandry has been accompanied by the development of the entire supply chain for agricultural inputs and equipment. Changes in livestock numbers are positively related to changes in the number of farmers and the degree of micro-credit.

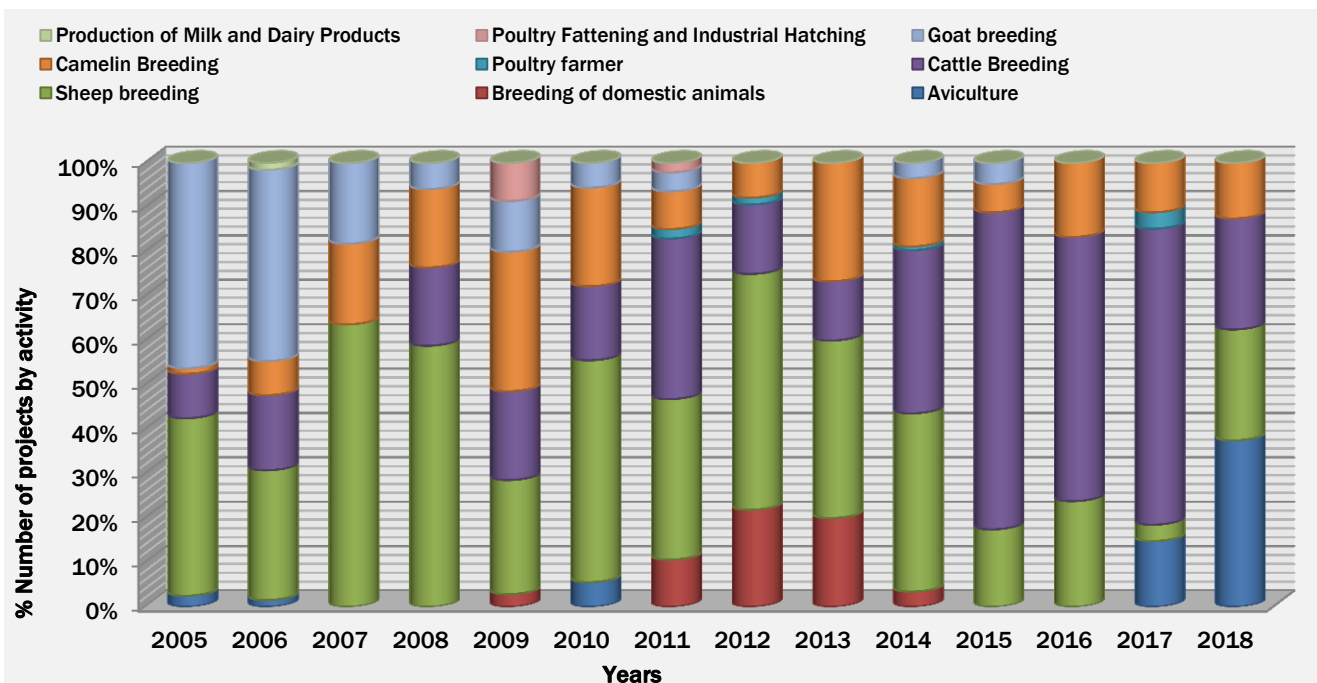


Figure 4- Number of projects for different activities

For our study, many breeders ignore their positive impact and those wishing to apply them do not master the technique. The majority of breeders (75.88%) believe that the lack of outreach programs is the major impediment to the development of these treatments. For this purpose, they should provide the necessary resources to the actors in charge of monitoring / evaluating agricultural investment programs (vehicle, computer, bonus ...) in order to help breeders for improving their production strategies. Such subsidies are mostly used to finance buildings or machinery. For livestock buildings in our case, breeders have built 30 sheepfold housing and 57 stables housing. Conversely to the situation of the vegetal production, for the rearing, the farmers (the area is <05 hectares) have benefited more than 50% of subvention distributed between 63% for the stables rearing, 77% for equipment and 25% for genetic amelioration.

It is worth mentioning that the remarkable evolution of production was observed from one commune to another. The good financial income obtained by large farms can be explained by the good management of breeding which is reflected by the low veterinary costs compared to the total costs. Large farms also potentially benefit from economies of scale that reduce unit production costs (Mosheim and Lovell, 2009) and promote increased regional production.

Inventory of investments and subsidies by type of project: Intensification of plant production, subsidies for agricultural equipment represent two-thirds of aid granted to this category, followed by units for the enhancement of agricultural products. In this context, breeders primarily invested in dairy and meat production, followed by forage farming for animal feed (Figure 5).

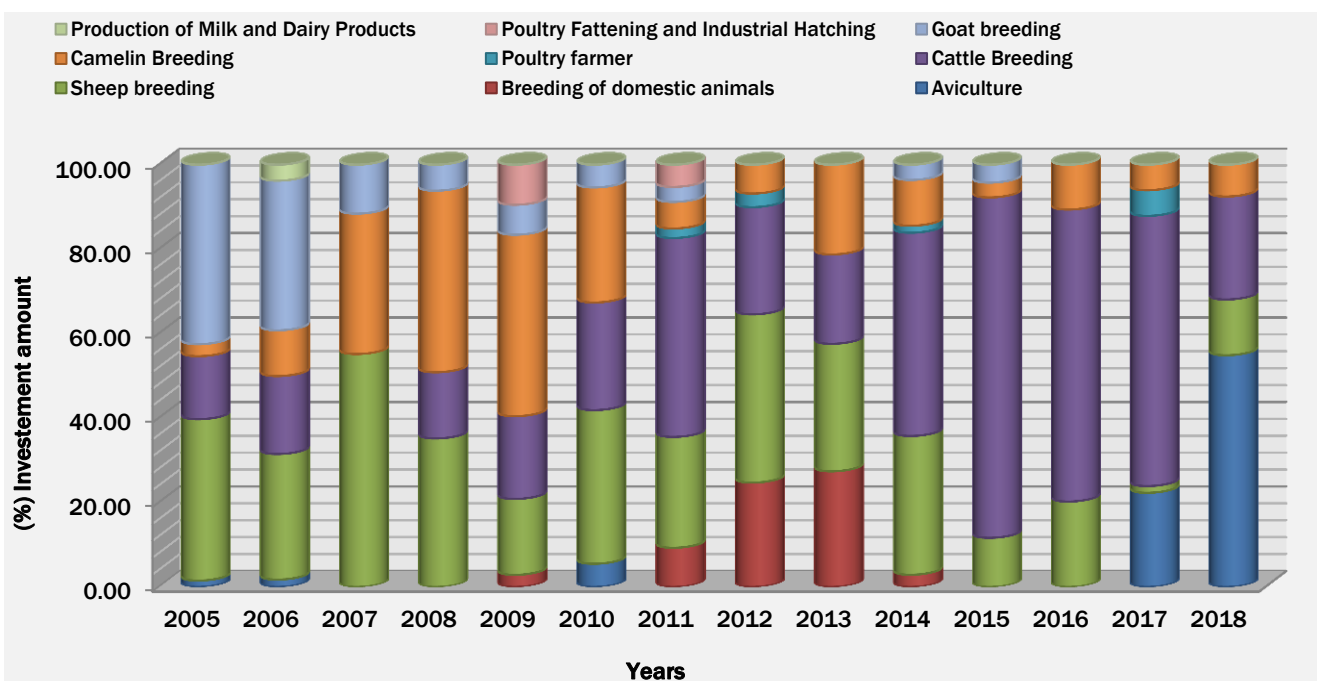


Figure 5 - Amount of investment for different activities

According to our study, the major investments of the exploitations in equipment linked to the attainment of battery farming (Hens, Rabbits) with 58 new units, equipment for slaughter units, and equipment for heifer nurseries with 09 units. These three types represented more than 90% of the investment and financial support quantity (Figure 5). Private investment incorporates a great vehicle of innovation, economic development, and paucity diminution (Musvoto et al., 2015; Tomich et al., 2019).

Indeed, 41% of investors' states that they enhanced their income due to investment, and 59% of the investors are implicated in future investment projects. Even though there are numerous investment practices, the most frequent technique is to boost the amount of land under cultivation, particularly forage (alfalfa) and orchards, and to boost livestock husbandry or increase the number of heads. Bensaha et al. (2020) noted that the importance of livestock mortality hazard management for breeders is enlarged by the obvious presence of low income in Algeria, characterized by multiple herd size balances such that losses push a breeder below a critical threshold.

Development of associative movement and scientific research

As part of training in the field of animal husbandry, the region has a number of training activities (Table 2). These associations will aim to rehabilitate the niche for better production and better support and moralization of farmers who have specialized in the agri-food industry. According to MADR (2018), these types of associations are for the maintenance of agriculture, and they present a form of a special partnership that is established between an agricultural producer and a group of consumers.

Table 2 - Training activities in the agricultural and agri-food sectors.

| Distribution across the 13 municipalities of the region | |
|---|----|
| Agricultural associations | 38 |
| Friends of nature and animal protection club. | 02 |
| Agricultural Vocational Training School | 01 |

This communication device includes multimedia information campaigns on agricultural development programs which will be carried out under the aegis of the National Agricultural Extension Institute (MADR, 2018). This system also includes, in terms of information and communication, multimedia information campaigns on agricultural development programs to be carried out under the aegis of the National Agricultural Extension Institute (Bensaha and Arbouche, 2015).

The number of farmers who gain from training and expansion is still not sufficient. It does not go beyond 10% of the objective for training or a collective of 111 farmers, 42% in crop production, and 58% in animal production. Serge and Jacqueline (2009) specify that the associations and the state have thus formed a decisive couple. Associations have often played pioneering roles in detecting new needs of producer farmers and transferring know-how. They are dedicated mainly to technical vocational training. These training courses are based on a network of partner farms in order to be as close as possible to the needs of farmers. According to DSA (2018), this helps farmers to organize themselves into associations, cooperatives, and unions in order to influence decisions during market negotiations and also to fully integrate into the activities of the date sector taken as a whole.

However, our study shows that the objectives of these agricultural training activities through associations, clubs, and schools have yet to prove to be satisfactory. This is due to the negligence of young farmers by their low levels of education. As well as these activities need to be endowed with appropriate logistics. According to Tebani et al. (2019), this meager result is justified by the big number of farmers in old age, uneducated and indifferent to agricultural technology, such as the restricted experience of expansion workers, the lack of means of travel, and of partnership between local authorities.

In addition, it should be noted that there is no effective involvement of actors and partners to take into account the issues of farms in their specificity, as well as the absence of articulation and a global vision Research / Training / Agricultural Council, which induces a low rate of adoption and dissemination of knowledge in terms of improved technologies. The main interventions to be developed will focus on the reorganization of the research system as well as the strengthening of its human, logistical, and financial capacities (Bensaha et al., 2013).

Finally, the current professional organizations of breeders should be restructured and strengthened for greater efficiency in the supervision and promotion of the sector. In addition, the poultry sector (family and semi-industrial) is likely to experience faster development through financial support actions for investments and training and supervision of breeders (Bensaha et al., 2020).

CONCLUSION AND POLICY IMPLICATIONS

Through its subsidy program, the State intends to encourage animal husbandry and the intensification of production by modernizing the livestock systems. The significant contribution of the state at exploitations investment for the putting in place of heifer nurseries encourages farmers to put into practice breeding techniques. Nevertheless, the prospects for

extending this existing policy and the revival of the agricultural sector remain possible, but for the objectives to be realized on the ground, it will be important to:

- Determine the practical objectives along with the real latent of each region
- Jointly address the economic and social justified through realistic projects
- Repair the administration responsible for the implementation of the programs and supply it with suitable means, defining the responsibility of each element responsible for the job awaiting it.
- Reform the actors implicated in rural development with a view to improving the sector organization and the real participation of farmers in their own projects.

Promoting the technical skills of technicians for program assessment and training and raising farmers' attentiveness

The positive impact of public investment suggests that Algeria should now devote more comprehensively to its own agricultural infrastructure, mainly to efficient livestock building management technologies. To sum up, the animal farm remains the backbone of farming in the study region and continues to supply significant economic and social functions. Moreover, animal farms play a significant role in maintaining the rural population and developing dryland areas. However, animal farm development policies should be modified considering the heterogeneity of agriculture, such as socio-economic factors. Yet, subsidies and farming strengthening have proven significant due to the non-continuity of action in time and space. Policymakers should support such investments in the agricultural sector through by implementing well-targeted public-private partnerships that fund structural projects.

DECLARATIONS

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Authors' contribution

From my point of view, it is consistent and concise work.

Conflict of interests

The authors have not declared any conflict of interest.

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