

Research Article

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The impact of the agronomist on the diffusion of agricultural technologies in a globalized era: A look at Mozambique

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Abstract

Keywords

Agronomist;
Globalization;
Agricultural
technologies;
Dissemination.

This article is part of reflections series on our identity, especially the contribution of agronomists in our daily lives in disseminating agricultural technologies, in an era when globalization reigns in all nations. This is an excerpt from a study carried out as part of a doctorate in agronomy at the Catholic University of Mozambique, Cuamba delegation, the aim of which is to understand the contribution of agronomy in disseminating agricultural information in a globalized era, taking into account the Mozambican context. This is a bibliographical study in which we looked for theoretical elements that discuss the subject. The readings point to an added value in the contribution of agronomists in the process of disseminating agrarian technologies as a driving force for increasing production.

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1. Introduction

The process of technological evolution in agriculture has always sought to improve current practices, which implies an accumulation of knowledge that allows man to have agricultural production technologies that reduce environmental restrictions on this activity. The Strategic Development Plan for the Agrarian Sector (Pedsa, 2011-2020), refers to the agricultural knowledge of Producers in Mozambique as the guarantee of success in the production process.

The perception of Globalization issues is today of great importance to understand global and local economic processes. Many studies are currently being carried out around the world based on this theme. Globalization today is a consolidated fact and is present throughout the world through advances in transportation and communication (Albano, 2005).

In Agriculture specifically, globalization has intensified in recent times in all countries of the world, generating interdependence between distant and apparently disconnected economies. Interdependence often happens through the action of large multinationals that operate all over the world, looking for places that have the best local advantages and that provide a greater financial return (Albano, 2011).

The dissemination of agricultural technologies in Mozambique is carried out using mass, group and individual methods, with group methods being the most used. Access to agricultural extension services by farmers in Mozambique has influenced the increase in production and farmers' income, thus leading to improved access to basic social services, namely health, electricity, drinking water and housing.

2. Agrarian globalization

Globalization is a term seen as alluding to the cumulative result of the set of transformations, more or less global, that converge to promote multiple international interconnections, progress

that appears to be growing and constantly accelerating (Muchacona, 2020, p. 116).

For Benko (1999, p. 237, *cited by* Muchacona, 2020), the word globalization “designates the current tendency of large companies to delegate part of their power to subsidiaries spread across the four corners of the world.

Globalization must be understood as a multidimensional and historical concept referring to global trends and dimensions that involve global impacts and connections between sociocultural and political phenomena (Catsossa, 2021), along this path, Chissano (2005), adds that as a consequence of these scenarios it creates There is room for a global awareness of social actors.

An essential dimension of globalization is the growing interconnection and interdependence between States, organizations and individuals around the world, not only in the sphere of economic relations, but also at the level of social and political interaction. In other words, events, decisions and activities that in a certain region of the world have meaning and consequences in very different regions of the globe (Chissano, 2005). One of the characteristics of globalization is deterritorialization, that is, relationships between men and between institutions, whether of an economic, political or cultural nature, tend to become disconnected from the contingencies of space (Chissano, 2005). On the other hand, Catossa (2021), says that globalization is also characterized by population movements and investments that move in both directions, causing rural entrepreneurs to invest in links in a chain that become increasingly distant from the sector. of agricultural production, strictly speaking.

Catsossa, (2021); Albano (2011), state that extractive practices have always led groups interested in exploiting natural resources to move to other places. However, this movement ends up creating space for exchange and exchange of cultures and technologies between nations.

Technological developments that facilitate communication between people and institutions and that facilitate the circulation of people, goods and services, constitute an important nerve center of Globalization (Muchacona, 2020, p. 117).

Through globalization, there is economic growth in Mozambique, but there is no development. Practical examples are that we can currently see that there are many Mozambicans with access to cell phones, bicycles, computers and much more. Meanwhile, this economic development provides the population with effective communication with others via radio, telephones and other mechanisms to receive information about the new technologies that agronomists make available (Muchacona, 2020, p. 117).

2.1 The agronomist and agricultural extension

The agronomist is considered as a mirror of the producers, he, therefore, must carry out the work of an educator, with emphasis on an education understood in its true perspective, that of humanizing man in the conscious action that he must take to transform the world. It must communicate, and not inform, an abstract reality to the peasant, and in communication it must reach man, not to the abstract being, but to the concrete being inserted in a historical reality. However, as an educator, he must go beyond his techniques, prescription, persuasion, not considering the peasants as blank paper for his propaganda (Uaiene, 2011).

In Mozambique, improved agricultural technologies have been highlighted in the main planning documents as important instruments for reducing hunger and poverty (Uaiene, 2011).

The Government directs extension services as the sole provider of advice, towards a much more flexible and pluralistic demand-driven system. The most important reforms include the decentralization of administration of field extension services; improving connections between farmers, educators, researchers, extension workers and others; and increasing the independence and flexibility of agricultural

extension services through the creation of small and semi-autonomous units within government ministries (Nepad, 2002 *cited by* Minag, 2007).

Extension services aim to provide farmers with better living conditions, access to public policies aimed at the primary sector and the opportunity to work with new agricultural technologies, which facilitate man's activity in the field and participate more frequently in decision-making. that affect rural extension activities. Rural extension, aimed at accelerating rural development, improving agricultural production, providing technical support to farmers in order to provide them with the necessary information not only for their organization but also as a response to their needs and improvement of agricultural techniques, becomes a fundamental instrument for the development of agriculture and for increasing production and productivity (Valá, 2006).

Mozambique is a country with the majority of the population residing in rural areas and the source of income is the agrarian sector, and other related sectors, with clear evidence of its role in the rural economy. Strategies are designed to increase the role of agriculture at family, district and country levels, one of which is the expansion of public agricultural extension services to increase the income of small farmers and transform them into market-oriented agents (Valá, 2006).

Pattanak *et al.*, (2003) *cited by* Lopes (2010), argue that access to public/private extension services plays an important role in the adoption of new technologies as producers are exposed to information about new technologies by extension agents (through group discussions, field demonstrations and other sources of information) tend to adopt new technologies, and significant changes in farmers' income are related to the adoption of new technologies.

The majority of the population has the agrarian sector as their main source of income and this agrarian sector has been the focus of several political, social, economic and academic debates, elucidating that the existing problem (low productivity and consequent income) is a matter

to be considered in the socio-economic development process of Mozambique. Therefore, government-level strategies are created, such as the provision of agricultural extension services, with a view to increasing farmers' productivity and income. Agricultural extension is one of the mechanisms that the government adopts to provide training services to agricultural producers in the informal sector to improve their production and productivity (Alegre, 2012).

Technical assistance in the agricultural extension area is said to be a set of communication, training and service provision activities for rural producers, aiming at the dissemination of production technology, management of rural activities, and preservation/recovery of resources natural resources, aiming to increase the production and productivity of rural producers and entrepreneurs, aiming to increase the profitability of their activities and generally solving specific, specific problems, without necessarily training the rural producer (Sant'ana, 2014). Marrengula (2015), states that technology transfer consists of teaching or showing the contact farmer how seeds should be used, how they should avoid pests, etc.

According to Valá (2009), in Mozambique agriculture is considered a crucial sector for economic development and the fight against poverty. The Constitution of the Republic emphasizes that agriculture is the basis for the country's development (Republic of Moçambique, 2004), recognizing that small producers are encouraged to adopt appropriate technologies and priority support will be given to producer associations and cooperatives.

According to Uaiene (2011), agriculture in Mozambique is focused on subsistence. However, to achieve the objectives of food security and nutrition for all and poverty reduction, a progressive transformation of the agrarian sector from subsistence family production to an integrated economy driven by growth in agricultural productivity is necessary.

In almost every place in the world where the process of agricultural transformation has been documented, agricultural productivity growth is promoted by improved agricultural technologies, including improved seeds, fertilizers and control of water resources (Uaiene, 2011).

For MINAG (2007), agricultural extension encompasses minimum core functions such as the transmission of technologies, the promotion of producer organizations, the development strategy, coordination and mandatory vaccinations. Other strategic functions include training producer organizations (in planning, service provision, and the value chain) and in business and management skills.

The extension worker is the point of contact with farmers and will act as the catalyst/facilitator within the participatory extension approach. Your main responsibility will be to work with farmer groups, train farmers, carry out regular visits, assist in identifying their problems, organize field demonstrations and field days, explain new technological options, cultivation practices, and provide information about markets, encourage farmers to test and compare these options with their current practices, and promote the exchange and dissemination of information within farmers. Extension agents will support producers to diversify their agricultural activities through the addition of new income-generating activities, such as the production of small animals, beekeeping, fruit crops, processing and non-agrarian work in the construction of houses and marketing (Minag, 2007).

The main activities carried out by extension agents in Mozambique in support of producers, consist of technology demonstrations, extension and research connection actions, market promotion, production and dissemination of technical material, radio programs, support in the preparation and implementation of projects and coordination with extension stakeholders at all levels (Mucavel, 2002).

The adoption of new technologies in agriculture has attracted special attention in economic development because the majority of the population in developing countries survives on subsistence agriculture and new technologies offer the opportunity to substantially increase their production and income (Feder *et al.*, 2009). In this line of thought, Silva (2019), states that in the case of technology for family farming, the existence and access to equipment suitable for this audience and high-quality inputs must be considered, to maximize productivity.

In turn, Silva; Eid (2014), argue that increasing crop productivity requires efforts in several directions, which means that new technologies and knowledge must be developed and introduced and, for this, the existence of a strong research and extension service is important and also involves the education and training of producers in various areas.

2.2 The diffusion and adoption of agricultural technologies

Agriculture is a very relevant activity for the economy and food security of developing countries such as Mozambique (Mucavele; Artur, 2021, p. 1).

Agricultural technologies are all types of knowledge used to increase productivity in agriculture, which can be through machines, software, computers, among others. In Mozambique, rural extension has been practiced since the colonial period, at a time when technical assistance was directed to certain export products, namely cotton, tobacco and cashew (Mucavele; Artur, 2021, p. 1).

Agricultural information is transferred through social interactions; hence, ties with agricultural informants and network structures in farmers' local neighborhoods. The contribution of new technologies to economic growth can only be realized when and if the new technology is widely diffused and used. Diffusion itself results from a series of individual decisions to begin using the new technology, decisions that are often the result

of a comparison of the uncertain benefits of the new invention with the uncertain costs of adopting it. An understanding of the factors that affect this choice is essential both for economists studying the determinants of growth and for the generators and disseminators of these technologies (Mucavele; Artur, 2021, p. 1).

Mubai; Lima (2014), state that the socioeconomic and political transformations that occurred with the establishment of a liberal economy in 1983, provided subsidies for the family agricultural sector to gain visibility and greater participation in the context of public policies for rural areas. On the other hand, the creation of the Public Agricultural Extension Services in 1987 marked the recognition of this social segment by the public sector.

Agricultural extension as a driver of the dissemination of agricultural technologies allows technical assistance and other agrarian policy measures that seek to respond to the agricultural production process and even reach farmers who use family labor.

Rural extension is closely linked to technology transfer and modernization in the countryside (Bernardo *et al.*, 2015). Following this (Pratiwi; Suzuki, 2017, p. 10), they report that empirical evidence shows that farmers learn new technologies from the adoption of these new technologies by their neighbors. "Traditional" production systems have suffered, over decades, different levels of transformation as a result of the intensity of capital penetration in rural areas, especially agrarian and commercial areas and the extraction of natural resources.

Urbanization, motivated by different reasons, economic and non-economic, has caused exoduses of different dimensions without being accompanied by structural transformations that allow an increase in production and productivity, to meet the demand for food in cities, which is aggravated by rates of population growth, generally high (Mosca, 2014).

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The new temporal and spatial conditions brought by globalization and, above all, the internet, are decisive for social ascension, equating rural men with urban men in conditions of equal access to the satisfaction of their technological needs (Bernardo *et al.*, 2015).

Mosca (2017), maintains that family farmers were systematically marginalized by these services. Therefore, several factors contribute to this reality, among them the poor coverage and training of technicians, scarcity of resources, inefficient value chain, poor quality of road infrastructure and conservation of agricultural products, market failures, access to extension services, low education, access to credit. The decision to use a technology is often the result of comparing the benefits and incentives of the new technology, that is, comparing its costs and benefits (Marassiro; Oliveira; Come, 2020; Uaiene, 2011).

The availability of technologies adapted to social, economic and ecological conditions associated with access to infrastructure and electrical energy or alternative sources can boost farmers so that they can increase their production levels and diversify their income (Marassiro; Oliveira; Purificação, 2021).

To increase the likelihood of adoption of modern agricultural technologies by smallholder farmers, policymakers should place emphasis on overcoming credit market deficiencies, access to advice through extension organizations, farmers' associations, and improved education.

3. Final considerations

The purpose of this article was to understand the agronomist's contribution to the dissemination of agricultural technologies in a world where globalization reigns. The research found that the dissemination of agricultural technologies in Mozambique is part of the agricultural sector's policies and the agronomist plays an important role in making information more comprehensive.

It was also found that globalization plays an important role in the diffusion of technologies, since the cultural exchange of different people from almost everyone in the world promotes the exchange of knowledge between communities.

Finally, it is important to emphasize that this research has great social relevance as it will help to show the potential that the agronomist has for the dissemination of agricultural technologies and the development of activities in this area and because it allows analyzing the potentials and limits of implementing a national technical assistance and rural extension policy, thus making it possible to establish a link between rural extension and policies to promote development and improve quality of life.

The use of improved agricultural technologies as a result of dissemination carried out by the rural extension sector, drives an increase in the yield of agricultural production. Agrarian technologies, however, can be disseminated through the field of demonstration of results, school in the peasant's field, use of media, among other methods.

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