

Review

Organic production and its market support policies

Gabriela Oshiro Reynaldo¹, Paula Martin de Moraes^{1*}, Leandro Skowronski², Gabriel Paes Herrera², Rildo Vieira de Araújo², Michel Constantino^{1,2} and Reginaldo Brito Costa^{1,2}

¹Local Development Postgraduate Program – UCDB, Campo Grande/MS, Brazil.

²Environmental Sciences and Agricultural Sustainability Postgraduate Program – UCDB, Campo Grande/MS, Brazil.

Received 10 October, 2018; Accepted 23 May, 2019

Populations around the world, especially in developed countries, have adopted a more conscious food consumption than that practiced conventionally, in their search for a better quality of life. In this scenario of concern about food, the organic products market is highlighted in the face of the high consumption of food produced with agrochemicals and agricultural inputs. In the last few years, there has been a significant market growth, moving 91.2 billion dollars. The present paper aimed to identify several organic production support programs, especially the Brazilian Food Acquisition Program (PAA). To this end, we used theoretical references about the theme, prioritizing the consultation of scientific articles and data from FiBL (Research Institute of Organic Agriculture). Results help understanding the increase in consumption, and they are associated with public policies that have been present in different parts of the world, more significantly in Europe and USA. However, it is necessary to note that support programs for the sector must be flexible and adapt to local capacities. It is worth emphasizing the importance of organic production units in Brazil, which have consistently increased the country's production, with direct support from PAA, and benefiting from the use of local family farming products in the National School Nutrition Program (PNAE).

Key words: Global organic market, support policies, organics in Brazil.

INTRODUCTION

Seeking a considerable quality of life, populations from various parts around the world have adopted a more conscious food consumption than that practiced conventionally. It is in this scenario that a concern about eating habits emerges as a highlight, especially with the appearing of a possible alternative in relation to the high consumption of food produced with agrochemicals and agricultural inputs: the organic products market.

Organic farming seeks a balance between a reasonable yield and a good quality of products and concerns itself

with generating minimum/limited environmental impact (Zanen et al., 2008). It is understood that organic food are those derived from a more balanced production system, because they do not make use of agrochemicals and mineral fertilizers. Consequently, organic production reduces conventional farming environmental impacts, and moreover, considers social issues in its productive cycle, as it propitiates the small farmer's permanence in the rural area, reducing exodus, poverty and misery in cities.

*Corresponding author. E-mail: paulamartin.bio@gmail.com.

Studies from FiBL – acronym for the name in German ‘*Forschungsinstitut für biologischen Landbau*’ that means Research Institute of Organic Agriculture (2018) – point out that organic farming has become a highlight worldwide in recent years after the production of organics moved 17.9 billion dollars in the world economy in 2000 and reached 91.2 billion dollars in 2016, an increase of more than 500% within fifteen years (corresponding to US\$ 73.3 billion).

In this context, the present study aimed to identify and present characteristics of organic production support programs around the world, and especially in Brazil. In order to do so, searches for theoretical references approaching on the theme of the present work were carried out, prioritizing the consultation of scientific articles and FiBL data. This paper is designed for the stakeholders on organic production and how public policies act on the market for these products.

BRIEF CONTEXTUALIZATION ON ORGANIC FARMING

Near the end of the nineteenth century, Von Liebig introduced the practice of chemical fertilization in agricultural activities. At the time, several scientists questioned Liebig’s position, claiming that biological processes were indispensable to maintain soil fertility. Discoveries of French scientist Louis Pasteur made it possible to prove the relevance of certain living organisms in the organic matter decomposition, as well as in nitrogen gas biological fixation processes. In such scenario, in the year of 1881, Darwin publishes the result of his researches on the function of earthworms in vegetable humus production (Escola and Laforga, 2014).

Pasteur’s and Darwin’s researches aroused other researchers’ academic instincts in the field of agronomy. The head of the Soil Management Division of the United States Department of Agriculture, R. H. King, publishes an article in 1911 where he describes his observations on Oriental agricultural practices, which led him to conclude that those peoples could keep a permanent and sustainable agriculture. Later on, Albert Howard conceived the pillars of organic agriculture in their current forms, that is, grounded on sustainability ideals, balance and low dependence of outputs. His researches unfolded between 1905 and 1930 in India, where the scientist demonstrated that several living processes that are dynamic and fundamental to the health of plants occur in soil (Escola and Laforga, 2014).

Practices that exalted organic fertilization have for a long time been belittled and trivialized. In 1960, environmental damages coming from practices considered as modern (with the intense use of agrochemicals and pesticides) become more visible; thus, in the 1970s, alternative practices gained new understandings and curiosities raised. Despite the advance, it was only in the

decade of 1980 that organic farming gained some credibility, as scientists increasingly started to take interest in more sustainable practices. Even scientists that did not support organic farming were aware of its importance (Kristiansen and Merfield, 2006).

In 1984, the United States Department of Agriculture (USDA) already recognized the importance of organic practice and conceptualized it as a production system that avoided or eliminated the use of fertilizers and the like. According to USDA, organic farming systems are based on crop rotation, organic fertilizations, natural minerals for plague control, among other practices considered sustainable. After about a decade since the growing interest on this topic, the volume of information increased allowing the publishing of Nicolas Lampkin’s book, “Organic Farming”, in 1990-a landmark for organic farming (Kristiansen and Merfield, 2006).

In this scenario, organic farming gained attention both from the academic community as well as from public policy makers, consumers and environmentalists of that time. It is in such a moment that the first organic farming support policies come up. However, it was not a simple task, as it was extremely complex to conciliate social and consumption aims in the face of market interests (Stolze and Lampkin, 2009). On the other hand, the academic milieu was becoming more favorable to the study of this area, which propitiated a “boom” of researches, many of which unfortunately not presenting effective results, for they only distinguished organic from non-organic farming, without any contribution to organic farmers (Lockeretz, 2002). Because it is a relatively recent field, the theme can still be a lot explored, but in a conscious way, without losing its ideals and the flexibility of adapting to different contexts where organic practices are included.

ORGANIC FARMING IN THE INTERNATIONAL CONTEXT

Studies demonstrate that organic farming and consumption have significantly increased in recent years. Increase that was intensified in the turn of the century, with the organic certified lands growing a total of 20 million hectares throughout the world between 2000 and 2008 (Willer and Kilcher, 2010). In this sense, it is important to mention what is regarded as the main differences between conventional and organic farming models (Table 1).

It is evident that organic farming seeks a balance between reasonable yield, quality of product and minimum environmental impact. An example of this are the inputs utilized, which are mostly composting waste and natural fertilizers (Zanen et al., 2008). Moreover, organics can generate profits between 50 to 100% higher when compared to conventional production, which makes them attractive to the small producer (Darolt and Skóra Neto, 2002). By 2016, organic production had 2.7 million

Table 1. Distinction between conventional farming and organic farming.

Conventional farming	Organic farming
Centralization of power and control in multinationals.	Decentralization of power, local and diversified control.
Dependence on numerous sources of external energy and services stemming from agribusiness.	Little dependence on inputs from outside of the property and the agribusiness complex, including rural credit.
Dominance over nature, and eternal struggle against nature to extract benefits for the human species.	Harmony with nature. Man and nature are inseparable and interconnected.
Based on specialization, plants and animals' genetic basis reduction and monoculture.	Based on practices that stimulate biological diversity at all levels of the production system.
Natural resources are treated as inexhaustible.	Commitment to natural resources conservation in the long term.
Competition is seen as a positive aspect for agriculture and society as a whole.	Importance of cooperation between agriculturists and the need for rural communities.

Source: Adapted from Beus and Dunlap (1990).

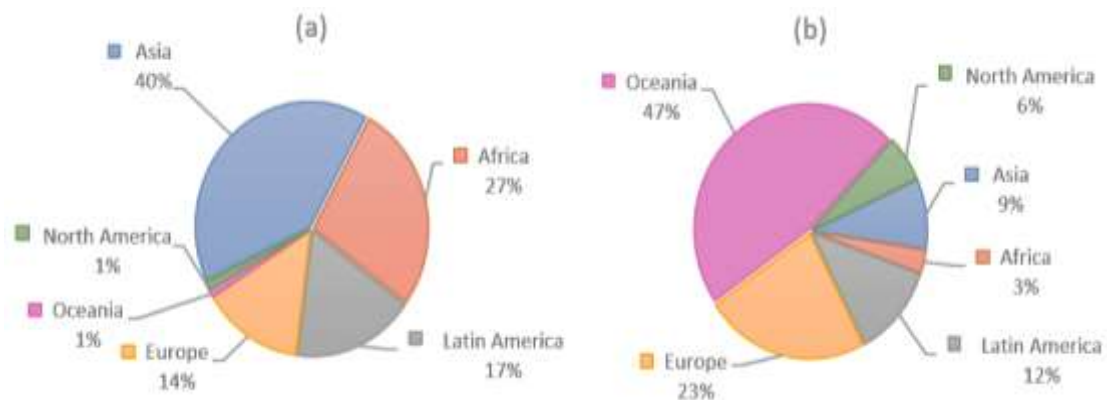


Figure 1. (a) Distribution of organic farmers by continent; (b) Distribution of organic agricultural lands by continent. Data from 2016.

Source: Adapted from FiBL; IFOAM (2018).

of producers worldwide, totalling 57.8 million hectares of land. However, the distribution of these organic farmlands across continents differs greatly from where organic producers are concentrated, as shown in Figure 1. A highlight is the Asian continent, where we find the greatest number of these farmers (40%), followed by Africa (27%), Latin America (17%), Europe (14%), Oceania and North America (1% each).

It is important to look more attentively at the African continent, as in spite of its low quantity of organic agricultural lands (only 3% of participation in total world lands aimed at organic farming) (Figure 1b), it presents high participation in production, with 27% of the world's organic producers (Figure 1a). According to data from UN, organic exports stemming from Africa grew from US\$ 4.6 million in 2002/2003 to US\$ 35 million in 2009/2010, a growth that was only possible with crop yield increase in countries such as Burundi, Kenya, Rwanda, Uganda and Tanzania. In this sense, organic farming features an opportunity for export in Africa. Nonetheless, financing for the sector has become more difficult in the last five years,

according to data presented by the United Nations Conference on Commerce and Development (UNCTAD) (ONU, 2016).

In spite of the large African organic production, organic products are hardly certified in this continent, as in some countries, there are difficulties in implementing such activity (Terrazan and Valarini, 2009). The recent scenario shows a still incipient progress in the African continent (total of 54 countries), showing only one country with regulations fully implemented, one country with incomplete regulations implemented, seven countries that are in the process of regulation and eleven countries with a standard for regulation but without legislation on organics, as demonstrated in Table 2.

Gudynas (2003) highlights that until 2003, organic certification was still a problem, with many countries presenting their own certification agencies, in some cases with the support of the state and others, such as autonomous enterprises. An example of this is Malaysia, a country that has potential for organic production, but lacks in government support. In 2003, a certification

Table 2. Organic regulation by continent or region.

Continent/Region	Regulations fully implemented in the country	Regulations not fully implemented in the country	Countries in the process of regulation	Countries with a national standard but without regulations
Europe	37	2	3	-
Asia and Pacific Region	21	4	6	22
Americas and Caribbean	18	3	2	-
Africa	1	1	7	11

Source: Data from FiBL; IFOAM (2018).

scheme was created to support the internal market. The goal consisted in facilitating organic production certification in this country, encompassing all production stages (Tiraieyari et al., 2014). Today there are numerous organic farms in this country, and implicit in these initiatives is the minimization of harmful effects on the environment, health and organic farmers' safety (DOA, 2007).

In 2001, Department of Agriculture (DOA) identified only 27 organic agriculturists in Malaysia in relation to a total area of 131 ha. After implementation of the certification scheme, the number increased in 2010 adding up to a total of about 42 certification holders, who occupied 1130 ha of farmlands. In 2013, 89 farms adopting the organic production system were found to occupy almost 1634 ha of lands; but among these accounted areas, only 49 farmers had a valid certification, while 40 agriculturalists presented expired certifications (Tiraieyari et al., 2014).

Despite an increasing organic production in Malaysia, the process of certification is very costly and complex, which consequently leads to the rising prices of products. Organic cultivation ends up restricted to vegetables and a few fruits. The market is also very limited, as local production has high prices and so does its commercialization. These factors discourage local farmers from producing organics (Ahmad, 2001).

One of the big problems faced by Malaysia in the organic sector is the issue of land access and ownership. The country has adopted temporary occupancy licenses (TOLs) in the region of Cameron since the beginning of the 1980 decade. According to this system, agriculturists can cultivate the land temporarily, with government renewal of concession taking place annually. In this way, farmers lose part of their motivation to invest without the safety of property ownership at the end of a year (Tiraieyari et al., 2014). Other problems are listed, such as scarcity of work force, since activities on the field are carried out manually, demanding a large number of workers; lack of training and extension services; lack of marketing related to raising awareness of organic products consumption benefits, along with matters concerning commercialization in the agriculturists'

association. Sales to neighbour countries, for example Singapore, are almost impossible; that is because the country does not import organics with the Malaysian seal.

An example addressed by Flaten et al. (2010) is Norway, where many farmers have been abandoning organic production, stating as their main reasons the excessive bureaucracy, high cost of the certification process, and also there is a constant regulation change allied to these. That generates uncertainties as to what the government will do in the future and might demand new adaptations on the part of agriculturists.

Despite this, data demonstrate that about 57.8 million hectares were aimed at organic products production around the world by 2016. That means to say that the quantity of agricultural lands aimed at organic farming worldwide is constantly rising and has presented increase of more than 420% since 1999 (FiBL; IFOAM, 2018). To visualize such event, Figure 2 shows the growth of organic agricultural areas by continent over the years, stemming from the increase of recognition (governmental and civil) of the environmental, social and economic benefits of sustainable agricultural practices. It is noted that the quantity of organic agricultural lands has been growing on all continents. Oceania, for example, presented the growth of more than 18 million ha the most significant increase in the period between 1999 and 2015 and holds the first position in the ranking of continents with greater quantity of organic agricultural areas. Followed by Europe, which increased its organic lands by almost 9 million ha, and Latin America, in the third position, with little more than 5 million ha of growth in that period. The other continents/regions presented increase of less than 5 million ha.

In this context, Figure 3 shows the ranking of countries with the largest organic agricultural areas in 2016, with Australia as a highlight, with the largest and most significant organic farming area of the world, comprising 27.15 million ha with organic areas. In general, studies of 2001 revealed that Australia was already ranked as the place with the greatest number of organic agricultural lands, with approximately 7.6 million ha. Currently, after Australia is Argentina with 3.01 million ha, followed by China, which surpassed the United States and its third

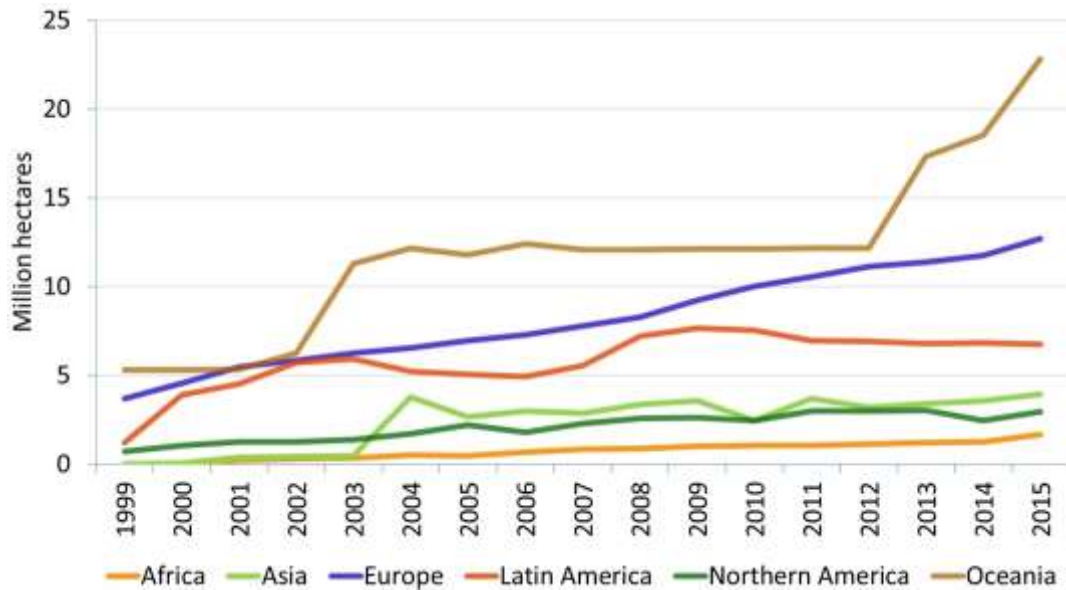


Figure 2. Growth of organic agricultural areas by continent.
Source: FiBL; IFOAM (2017).

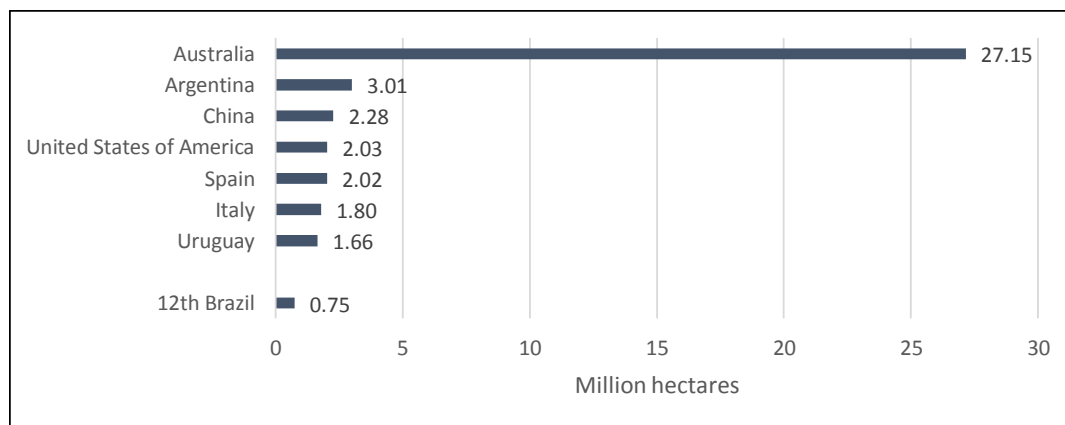


Figure 3. Classification of countries with the largest organic farming areas in 2016.
Source: Adapted from FiBL; IFOAM (2018).

position of 2015. Brazil, in spite of its continental proportions and the fact that a large part of its economy comes from agribusiness, holds only the twelfth place in quantity of lands aimed at organic agriculture, with 750 thousand ha (FiBL; IFOAM, 2018). Still, some statistics evidenced that in the year of 2007 about 32.6 million ha were certified worldwide, of which 6.4 million were located in South America, mainly in Argentina and in the Center-West of Brazil (Fonseca, 2009).

In 2003, Argentina was already the second country, on a global level, with the largest acreage dedicated to organic production. But it was Uruguay – currently with 1.66 million hectares (Figure 3) – that occupied the first

position among Latin America's countries, considering its proportion of agricultural lands dedicated to organic farming in relation to conventional farming (Gudynas, 2003). Back then, Mercosul soon became the second trading bloc with the largest organic acreage, lagging behind only the European Union. The main export destinations were the European Union itself, USA and Canada (Gudynas, 2003). Still, for Gudynas (2003), Latin America presented significant growth potential in national and international markets because of its diversity of organic products grown. It is pertinent to emphasize that Latin America has the peculiarity of being a great exporter, which can be intimately associated with the

process of colonization of its countries, marked specially by the exploitation of natural resources.

In this sense, Brazil is in the process of consolidating its organic market and the estimate is that it will strengthen in the coming decades. In a research released in the beginning of 2017, the Brazilian Council of Organic and Sustainable Production (ORGANIS) showed that the Brazilian consumer is selective when purchasing and that organic consumption is more restricted to people with higher levels of education and income.

In 2017, Brazil's organic production area remained at approximately 750 thousand hectares. This type of cultivation can be found in 22.5% of Brazilian municipalities according to the Agroecology Coordination (COAGRE) of the Farming and Cooperativism Development Secretariat (SDC). Nevertheless, from 2013 until 2017, Brazil's organic products production more than doubled, highlighting the Southeast region as the largest acreage with 333 thousand hectares and more than 2,700 farmers registered in the National Commission for Agroecology and Organic Production (CNAPO). The second place is the North region, with 158 thousand hectares, followed by the Northeast region with 118.4 thousand, Center-West with 101.8 thousand, and finally, the South region with 37.6 thousand ha (Coagre, 2017). The importance of this growth is in the rural producer's awareness, as they have been decreasing use of chemical inputs in their production, benefiting the consumer, who starts having a healthier product and a more balanced environment. This nationwide advance occurred after the formulation and implementation of public policies by the federal government, such the Food Acquisition Program (PAA) in 2003 and the National School Nutrition Program (PNAE) in 1979, which included organic products in children's school meals. Programs such as these become motivating for the small producer, especially for family farmers, who may have their sales market expanded and not solely dependent on street markets as has occurred in most cases.

ORGANIC MARKET SUPPORT POLICIES

Data from FiBL show that the global organic market traded more than 80 billion euros in 2016 (about US\$ 91.2 billion). The United States is the country of greatest individual market for organic food, with approximately 46% of participation in the global market and moving more than US\$ 44.4 billion in 2016, followed by Germany (US\$ 10.8B), France (US\$ 7.6B) and China (US\$ 6.7B) (FiBL; IFOAM, 2018).

According to data released by the National Agricultural Statistics Service (NASS) of the United States Agriculture Department (USDA), the gross value of sales of all certified organics produced and sold in the U. S. in 2016 was US\$ 7.6 billion. This amount represents a significant increase in these products sales in the country with

regard to the year of 2015 (an increase of 23%), and that was because the population had been looking for and preferred to consume organics associated with a real change of habits. There was also increase in production, which made the country reach the mark of more than 14,200 organic production certified farms in 2016 – a total of 2.03 million hectares of lands – which represented an annual increase of 1.5% in production area (USDA, 2017). As to the European Union, implemented in 2014 a regulation that began to regulate production and also boosted organic cultivation. In 2015, the organic market increased by 7% in that region and traded 75 billion of euros (EMBRAPA, 2017). It is worth to highlight Tuson and Lampkin's (2007) contributions, who listed financial policy instruments with emphasis in the commercialization of organic products, such as inspection costs support, which were present in some localities of Germany, Denmark, Luxemburg and Netherlands.

In this context, Kleijn et al. (2001) remind that, in recent decades, the academic community and civil society initiated a discussion on the efficiency of agricultural subsidy programs that aim at preserving biodiversity and promoting environmental sustainability. Authors such as Krebs et al. (1999) and Reganold et al. (2001) emphasized that organic farming subsidy or support programs had as their goal the increase of biodiversity, especially in agricultural pastures. Therefore, studies came up to verify organic farming positive effects as for the initial objective of contributing to biodiversity diversification. For Bengtsson et al. (2005), in most of the cases organic farming brings positive effects to organisms and natural landscapes, among which is biodiversity maintenance. That implies the sector relevance and demonstrates the importance of investments in organic subsidy programs. However, it is necessary to observe that these programs shall be flexible, adjusting to the particularities of each place where it is implemented.

In the Brazilian scenario, organic farming has been consolidating gradually. The available data shows that there are about 15 thousand properties certified and/or in the process of certification, of which 75% is composed of family agriculturists (Sebrae, 2017). The significant growth in number of organic producing units was evidenced in just three years, going from 6,700, in 2013, to approximately 15,700 units in 2016 (Organicsnet, 2017). The regulation of organic products in Brazil had as a milestone the Law nº 10,831, which established criteria for the production, processing, labelling and marketing of organic products in the country (BRASIL, 2003). However, there is still not a full regulation, in view of the high costs to do so (Santos, 2005). Thus, a more active posture of the state is needed in the process of organic farming regulation, as well as in what concerns commercial policy measures. The small producer, lacking in infrastructure and support (from public or private sectors), will find difficulties in adjusting to organic food

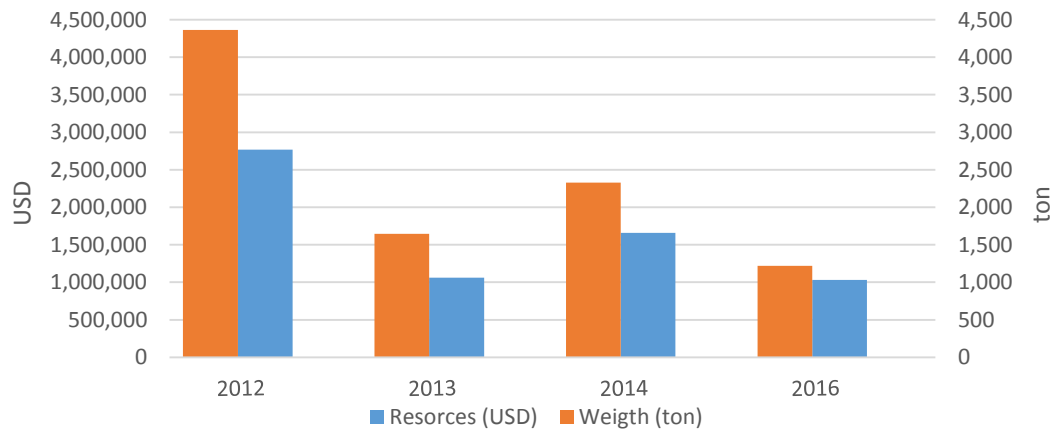


Figure 4. Amount of resources and organic products traded by the Food Acquisition Program (PAA) and the National Supply Company (CONAB) in Brazil.

Source: PAA. Elaboration of the authors. (Currency conversion value: US\$ 1 = R\$ 3.72).

regulations (Luizzi et al., 2017). This is still a challenge to be conquered that depends on concrete actions of the government.

It is important to emphasize that Brazil's climatic and geographic conditions are quite different from the conditions of developed countries in Europe and North America. Hence, the adjustment to international norms and practices will happen in a distinct way from that which occurs in European countries. This means that Brazilian organic certification peculiarities represent an obstacle to be overcome in the prospect of entering the world market (Ormond et al., 2002).

Another difference is that the internal demand is lower than the external, once the most Brazilian organic products are exported to Europe, the United States and Japan. The Brazilian production of these products is relatively low when compared to developed countries, though the Brazilian organic production growth rate surpasses international rates (Luizzi et al., 2017).

In this context, analysing Brazil's organic products trade is first of all understanding its economic relationship with European, North American and Japanese markets. Moreover, it is relevant to glimpse the organic production system, seeking to make proper use of Brazilian peculiarities such as climate, soil, lands extension, diversity of organically grown produce, among others.

In order to understand the policy to support organic agriculture in Brazil it is necessary to address, in particular, the Food Acquisition Program (PAA). This program is a federal government policy aimed at minimizing hunger and poverty, as well as strengthening family farming. To this end, PAA makes use of trade mechanisms that propitiate the direct acquisition of products coming from family farming or from their organizations. A good part of these acquired foods are intended for school meals, inserted in the context of the National School Nutrition Program (PNAE), which seeks

the formation of healthy habits in the educational system (Brasil, 2009; Silva and Souza, 2013), even though challenges related to regularity of production and certification problems persist.

However, in recent years, the amounts operated by PAA intended for Brazil's organic market in Brazil evidencing a considerable drop of more than 60% in total resources invested between 2012 and 2013, as well as in the quantity of products traded in several modalities of PAA (Figure 4). Although there had been an increase of more than 500 thousand dollars for resources in 2014, an investment decrease was again observed in 2016, which recorded the lowest averages for both variables. The modalities and amounts of Brazil's PAA are structured according to the information contained in Table 3. Another form of support from the federal government for the consolidation of organic agriculture was the creation of the so-called "Agro-ecological Records", aimed at meeting the lack of information that farmers has when they decide to enter the organic sector. The initiative stands out as a public policy to encourage the production of organic food, since such records contain techniques of soil management, plant management, techniques of agricultural inputs for sanitary, animal and vegetal control, green fertilization and other practices that assist in organic production. These records are organized and provided by the Ministry of Agriculture and the Organic Production Intelligence Centers (CI Orgânicos) in their respective websites <www.agricultura.org.br> and <www.ciorganicos.com.br>.

The CI Orgânicos have as their main goal to strengthen organic production in Brazil, using the integration and diffusion of information and knowledge as a tool. It is supported by National SEBRAE (Brazilian Micro and Small Business Support Service) and SEBRAE Rio de Janeiro, and develops a work for the identification, treatment, collection, analysis and dissemination of

Table 3. Modalities of Brazil's PAA (Food Acquisition Program).

Modality	Form of access	Annual Limit	Resource Origin*	Action
Purchase from Family Farming for Simultaneous Donations	Individual	US\$ 1,210	MDS	Responsible for the donation of products acquired from family farming to people in situation of food and nutritional insecurity
	Organizations (cooperatives/associations)	US\$ 1,290		
Formation of Stocks by Family Farming –CPR Stock	Organizations (cooperatives/associations)	US\$ 2,150	MDS/MDA	Makes resources available so that family farming organizations form product stocks for subsequent commercialization.
Direct Purchase from Family Farming – CDAF	Individual or organizations (cooperatives/associations)	US\$ 2,150	MDS/MDA	Aimed at the acquisition of products with falling prices or according to the need to meet food demands of populations in conditions of food insecurity
Incentive to Milk Production – PAA Milk	Individual or organizations (cooperatives/associations)	US\$ 2,150	MDS	Ensures the free distribution of milk in actions to fight hunger and malnutrition of citizens that are in situation of social vulnerability and/or in state of food and nutritional insecurity. Serves the Northeast states.
Institutional Purchase	Individual or organizations (cooperatives/associations)	US\$ 2,150	-	Purchase aimed at meeting the food consumption regular demands of the Federation, states, the Federal District and municipalities.

*MDS – Ministry of Social Development; MDA – Ministry of Agrarian Development.

Source: Brasil (2017). Ministry of Agrarian Development. (Currency conversion value: US\$ 1 = R\$ 3.72).

information and strategies for the organic production system development. The result of this work is the increase in quality of products and competitiveness between farmers, benefiting the market and the consumer.

Another tool used by the Ministry of Agriculture are the 578 units of Organic Production Commissions (CPORGs), which have been coordinating actions to stimulate sustainable farming in diverse Brazilian states. From these commissions information exchange between the states' representatives is carried out, as well as the coordination of projects aimed at supporting and generating interest in organic production and increase in the food supply of the country.

Moreover, the National Society of Agriculture (SNA) elaborated a project called *OrganicsNet* (Community Network for the Access of Organic Farmers to the Market) that provides data about the organic market, being a focal point between producers and businesses. This project seeks the improvement of the Brazilian organic production chain through the platform <www.organicsnet.com.br>, where the information aim at providing increase of value added to this sector, increase and penetration into the market of small and medium farmers, access to management tools, incentives to the integration and exchange of information, among others. Besides its project on the internet, SNA offers 53 extension courses on organic production chain.

In spite of many efforts to encourage organic farming, there is still a long way to go, considering that Brazil is a country still marked by numerous social inequalities that are mostly caused by the concentration of land in the hands of a few. In this sense, the implementation of more effective public policies becomes necessary and should be thought "from the bottom up", so as to value the small and medium producers who, unlike the large producers of commodities for export, contribute substantially in food production in Brazil.

FINAL CONSIDERATIONS

Countries such as the United States, Germany, France and China lead the organic products commercialization ranking in the global scenario. The production increase curve continues rising and it is estimated that, in a not so distant future, most part of these countries' agricultural production territory will be aimed at organic production. To foster this production, large supermarket chains associated with small farmers have been carrying out the purchase of great quantities of organic food, thus stimulating economy in this sector.

In a desirable way, organic market support policies have been happening in several parts of the world, more significantly in Europe and the United States, motivating organic food producers in cultivation and domestic

commercialization matters, and also boosting exports. However, it is necessary to observe that support programs in the sector must be flexible and adjust to local capacities. These aspects are evident when analyzing different countries and continents, each one with its own particularities.

It is worth emphasizing the importance of organic production units in Brazil, which have consistently increased the country's production. The existence of more than 50 companies associated with the Brazilian Council of Organic and Sustainable Production (ORGANIS) and the Organics Project Brazil have boosted both external and domestic markets. On the other hand, public policies, especially the Food Acquisition Program (PAA), which makes use of trading mechanisms that propitiate the direct purchase of products coming from family farming or its organizations, also favor the growth of this production sector in Brazil. In this particular context, the National School Nutrition Program (PNAE) is a highlight, as its products stem from local organic family farming. Nevertheless, as in other countries around the world, challenges related to the regularity of food production and certification still persist.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

ACKNOWLEDGMENTS

The authors appreciate the partial financial support from *Conselho Nacional de Desenvolvimento Científico e Tecnológico* (CNPq) and *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil* (CAPES).

REFERENCES

- Ahmad F (2001). Sustainable agriculture system in Malaysia. In Regional Workshop on Integrated Plant Nutrition System (IPNS), Development in Rural Poverty Alleviation, United Nations Conference Complex, Bangkok, Thailand pp. 18-20.
- Bengtsson J, Ahnström J, Weibull AC (2005). The effects of organic agriculture on biodiversity and abundance: a meta-analysis. *Journal of Applied Ecology* 42(2):261-269.
- Beus CE, Dunlap RE (1990). Conventional versus alternative agriculture: the paradigmatic roots of the debate. *Rural Sociology* 55(4):590-616.
- BRASIL (2003). Law nº10,831, from December 23, 2003. It provides for organic farming and other measures. Official Diary of the Union. Available in: https://www.planalto.gov.br/ccivil_03/Leis/2003/L10.831.htm Accessed on: February 2019.
- BRASIL (2009). Law nº11,947, from June 16, 2009. It provides for the care of school feeding and the money direct in-school program to students of basic education. Official Diary of the Union. Available in: http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2009/Lei/L11947.htm Accessed on: January 2018.
- BRASIL (2017). Ministry of Agrarian Development (MDA). Special Secretariat for Family Agriculture and Agrarian Development. Modalities of the PAA. Available in: <http://www.mda.gov.br/sitemda/secretaria/saf-paa/modalidades-do-paa> Accessed on: January 2018.
- COAGRE (2017). Coordination of Agroecology – Special Secretariat of Family Agriculture and Agrarian Development. Mais orgânicos na mesa do brasileiro em 2017. Available in: <http://www.mda.gov.br/sitemda/noticias/mais-org%C3%A2nicos-na-mesa-do-brasileiro-em-2017> Accessed on: May 2018.
- Darolt MR, Skóra Neto F (2002). Sistema de plantio direto em agricultura orgânica. *Revista Plantio Direto* 70:28-30.
- Department of Agriculture (DOA) (2007). Standard Skim Organik Malaysia (SOM): Malaysian organic scheme. Jabatan Pertanian, Malaysia. Available in: <http://chbiotechnology.com/wp-content/uploads/2014/09/Malaysia-Organic-Scheme.pdf> Accessed on: January 2018.
- Escola R, Laforga G (2014). O mercado de produtos orgânicos: abordagem da produção orgânica no município de Itápolis. Available in: <http://www.sober.org.br/palestra/6/127.pdf> Accessed on: January 2018.
- EMBRAPA (2017). Oficial da FAO apresenta seminário sobre agricultura orgânica. Available in: <https://www.embrapa.br/busca-de-noticias/-/noticia/25511299/oficial-da-fao-apresenta-seminario-sobre-agricultura-organica>. Accessed on: July 2018.
- FiBL; IFOAM (2017). Media kit of The World of Organic Agriculture 2017. Available in: <http://www.FiBL.org/fileadmin/documents/en/news/2017/mr-world-organic-agriculture-2017-english.pdf> Accessed on: January 2018.
- FiBL; IFOAM (2018). The World of Organic Agriculture: statistic and emerging trends 2018. Available in: <http://www.organic-world.net/yearbook/yearbook-2018.html>. Accessed on: August 2018.
- Flaten O, Lien G, Koesling M, Løes AK (2010). Norwegian farmers ceasing certified organic production: Characteristics and reasons. *Journal of Environmental Management* 91:2717-2726.
- Fonseca MFAC (2009). Agricultura Orgânica: regulamentos técnicos e acesso aos mercados de produtos orgânicos no Brasil. Niterói: PESAGRO-RIO. Available in: <https://ainfo.cnptia.embrapa.br/digital/bitstream/item/32349/1/AgriculturaOrganica.pdf>. Accessed on: January 2018.
- Gudynas E (2003). Producción orgánica em América Latina crecimiento sostenido com énfasis exportador. Observatorio del Desarrollo. Available in: <https://www.engormix.com/agricultura/articulos/el-crecimiento-de-la-produccion-organica-en-america-latina-t26924.htm>. Accessed on: January 2018.
- Kleijn D, Berendse F, Smit R, Gilissen N (2001). Agri-environment schemes do not effectively protect biodiversity in the Dutch agricultural landscapes. *Nature* 413(6857):723-725.
- Krebs JR., Wilson JD, Bradbury RB, Siriwardena GM (1999). The second silent spring? *Nature* 400:611-612.
- Kristiansen P, Merfield C (2006). Overview of organic agriculture. In: *Organic Agriculture: a global perspective*. Csiro Publishing 484:1-23. Available in: <http://orgprints.org/14043/1/14043.pdf>
- Lockeretz W (2002). Strategies for organic research. In: Powell, J. (ed.) *Proceedings of the UK Organic Research 2002 Conference: Research in Context*. 26-28 March 2002 Aberystwyth. Organic Centre Wales, Institute of Rural Studies, University of Wales Aberystwyth, Wales, United Kingdom. p.25-31). Available in: <http://orgprints.org/8490>
- ONU-BR (United Nations Organization in Brazil) (2016). United Nations Organization in Brazil. Agricultura orgânica tem potencial na África, mas falta financiamento. Available in: <https://nacoesunidas.org/agricultura-organica-tem-potencial-na-africa-mas-falta-financiamento/>. Accessed on: January 2018.
- Organicsnet (2017). Produção orgânica mais que dobra em três anos no Brasil. Available in: <http://www.organicnet.com.br/2017/01/producao-organica-mais-que-dobra-em-tres-anos-no-brasil/> Accessed on: January 2018.
- Ormond PJ, Paula SRL, Faveret Filho P, Rocha LTM (2002). Agricultura Orgânica: Quando o passado é futuro. *BNDS Setorial, Rio de Janeiro* 15:3-34.
- Reganold JP, Glover JD, Andrews PK, Hinman HR (2001). Sustainability

- of three apple production systems. *Nature* 410(6831): 926-929.
- Santos LCR (2005). Regulamentação da Agricultura Orgânica no Brasil: Caminhos, "descaminhos" e sua contribuição na construção do sistema de comércio ético e solidário. Available in: <http://www.cnpq.embrapa.br/organica/pdf/caminhos_descaminhos.pdf>. Accessed on: February 2018.
- Sebrae (2017). O mercado para os produtos orgânicos está aquecido. Available in: <http://www.sebrae.com.br/sites/PortalSebrae/artigos/o-mercado-para-os-produtos-organicos-esta-aquecido,5f48897d3f94e410VgnVCM1000003b74010aRCRD>. Accessed on: January 2018.
- Silva APF, Souza AA (2013). Alimentos orgânicos da agricultura familiar no Programa Nacional de alimentação Escolar do Estado de Santa Catarina, Brasil. *Revista de Nutrição* 26(6):701-714.
- Stolze M, Lampkin N (2009). Policy for organic farming: rationale and concepts. *Food Policy* 34(3): 237-244.
- Terrazan P, Valarini PJ (2009). Situação do mercado de produtos orgânicos e as formas de comercialização no Brasil. *Informações Econômicas* 39(11): 27-41.
- Tiraeyari N, Hamzah A, Samah BA (2014). Organic Farming and Sustainable Agriculture in Malaysia: Organic Farmers' Challenges towards Adoption. *Asian Social Science* 10(4): 1-7.
- Tuson J, Lampkin N (2007). Organic Farming Policy Measures in Pre-2004 EU Member States and Switzerland, 1997-2004. Further Development of Organic Farming Policy in Europe with Particular Emphasis on EU Enlargement (QLK5- 2002-00917), Aberystwyth University.
- USDA (2017). United States Department of Agriculture. Certified Organic Survey 2016 Summary by NASS – National Agricultural Statistics Service. Accessed on: August 2018. Available in: https://www.nass.usda.gov/Publications/Todays_Reports/reports/census17.pdf
- Willer H, Kilcher L (2010). *The World of Organic Agriculture. Statistics and Emerging Trends 2010*. IFOAM, Bonn and FiBL, Frick. Available in: <https://www.organic-world.net/fileadmin/documents/yearbook/2010/world-of-organic-agriculture-2010.pdf>
- Zanen M, Bokhorst JG, Koopmans CJ (2008). Soil Fertility and Biodiversity effects from Organic Amendments in Organic Farming. 16th IFOAM Organic World Congress, Modena, Italy, June 16-20, 2008. Available in: <http://orgprints.org/11622>