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Analyzing Agribusiness Value Chains: As a Starter of Competitiveness in the Future

Youssef M. Hamada

Agricultural Economics Research Institute, Egypt, E-mail: youssef_hamada@yahoo.com

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Abstract: *Finally, within the value chain analysis, a topic that cannot be avoided is how much value is created, and how it is distributed. This is a more accounting point of view, and we called it a price assessment approach. Particularly for the context of agribusiness chains, the question of how much value every actor creates, and what sort of it receives is on the regular discussion.Since the main characteristic of agri-food chains is the different farm and at farm gate market structures, where primary stages show aspects of competition while industry and distribution tend to show degrees of market power, this conducts frequent conflicts between actors. Being able to develop indicators in this regard, helps to better understand and tackle those conflicts. Where development organizations have been playing a central role enriching the body of point of view. Mainly with intervention objectives and with the aim of giving their technicians a tool to work with value chain actors, there has been a proliferation of manuals and guidelines. This is important particularly to the agri-food sector, as developing countries enter into food global value chains as primary producers, in most cases with scarce or none value-added, and showing poor conditions for the actors involved.Having obtained these tools, approaches, and point of views that operate as methodological frameworks for the analysis of agribusiness value chains, and with a better understanding of the multidimensional aspects of the concept, further analysis should be oriented to develop mathematical framework models and objective indicators to measure competitiveness and performance in agribusiness value chains. Where the aim of this research is to compare three methods to trace competitiveness and performance in agribusiness value chains: Agribusiness value chains assessment (**AVCA**), environmental agribusiness value chains assessment (**EAVCA**), and environmentally extended input-output agribusiness analysis (EE-IOAA).*

Keywords: Agribusiness value chains assessment (AVCA), environmental agribusiness value chains assessment (EAVCA) and environmentally extended input–output agribusiness analysis (EE-IOAA).

INTRODUCTION

The concept of agribusiness as a theoretical framework is that its inception naturally related to the belief of the value chain.Back in the mid-20th century, increasing bonds between consumer experience and agricultural production had already been identified. Davis (1956) stated that technological exchange 'has added agricultural manufacturing and advertising closer and nearer together – truly making them interdependent' and thus 'we need to look not simply at production at the farm but at the combination of all agricultural purchasing product-distribution operations' (Davis, 1956). The idea of a positive product at the customer table and a constant set of value-including operations wanted for that to occur, is rooted within the very idea of agribusiness. In the agribusiness sector mainly, the concept implies extra complexities, which include the hazard emanating from the biologic techniques, the purpose of buffer stocks, and the specific farm and at-farm-gate marketplace structures (Sporleder and Boland, 2011).These complexities create the want to make a perception on how a value chain is described, and the way its performance may be measured.

The concept of the value chain is constantly changing. Developed inside the past the late 60s, the older Francophone model (the filière approach) targeted the links among organizations for the production and distribution of agricultural commodities within countrywide boundaries. The modern evolved Anglophone Global Commodity Chain (GCC) analysis makes a specialty of globally fragmented however interlinked production systems. Even in this permanent evolution, the idea of a certain number of actors performing value-adding activities has remained at the heart of the value chain definition (Gereffi *et al.*, 2001; Kaplinsky and Morris, 2002).Gereffi *et al.* (2005) factor out that it is necessary to identify not unusual parameters to determine value chain taxonomy, which may be embodied in a sturdy set of indicators.The absence of a theoretical framework operates as restrict to generalizations that may be crafted from distinctive evaluation, and to comparisons among value chains.From a public and very simple factor of view, a traditional value chain is described as a 'full range of activities which might be required to deliver a product or a service from conception, through the specific phases of production (concerning an aggregate of physical transformation and the center of numerous manufacturer services), transport to very last consumers, and final disposal after use' (Kaplinsky and Morris, 2002). Bellú (2013) defines a value chain as both a set of 'interdependent economic activities' and a 'corporation of vertically linked economic agents'. Where the conception that a value chain is made from the interplay of a fixed of activities, that necessarily have to be performed, and a set of actors that perform them in one-of-a-kind stages.

The authors highlight that production itself is the best one of the many value-adding links of the value chain. With a broader aspiration of analyzing value chain performance and competitiveness in the future, the main goal of this research especially is to make the first approach to methodologies for the evaluation of agribusiness value chains.This is an obligatory first step to delve into value chain competitiveness and performance.The main question we want to ask through this research is: what are the methodological approaches, available tools, or existing points of view that can be used to analyze an agribusiness value chain?

MATHEMATICAL MODEL

The conventional and original technique to the concept of the value chain is the idea of Filière. It was developed in France during the 1960s, by the French National Institute for Agriculture Research (INRA) and the French Agricultural Research Centre for International Development (CIRAD).This concept was used to describe agricultural commodity chains, through the analysis of inputs and outputs, and a quantitative measure of cost, prices and value-added (Bellú, 2013; Bertazzoli *et al.*, 2011; Faâe *et al.*, 2009 and Kaplinsky and Morris, 2002).The concept of Filiére implies a structural view on value chains, searching for to describe the approaches that arise within the production and distribution of agricultural commodities. It is mainly descriptive and clearly static, showing quantities at one moment of time, but missing precision in describing how the relationships alternate and evolve the doorway and go out of actors and the developing or shrinking of physical and economical flows (Faâe *et al.*, 2009; Kaplinsky and Morris, 2002). The main purpose of French scholars in this regard was to discover a framework to research the procedures of vertical integration and contract manufacturing that had been taking place inside the French agricultural sector in the 1960s.

In the 1980s, ideas regarding the concept of value chain started to emerge from the field of strategic management.Researchers in this field started to explore this belief inside the organization's boundaries.The seminal works were the one of Michael Porter, reading the idea of value chain associated with the gain of competitive advantages by using the firms (Bertazzoli, *et al.*, 2011; Faâe *et al.*, 2009; Kaplinsky and Morris, 2002).Porter (1985) identifies a fixed of primary activities (inbound logistics, operations, outbound logistics, advertising and marketing, and sales and services) and a set of assist activities (corporation infrastructure, human aid management, technology improvement, and procurement).The total value is the amount buyers are willing to pay for what a firm provides them, and consists in the distinct activities a firm performs (physically and technologically) and a margin (Porter, 1985). The main limitation of Porter's analysis is that his value chain approach is confined to the firm level, overlooking the analysis of up- or downstream activities beyond the company (Faâe *et al.*, 2009). In the same line, another concept that arose from the perspective of strategic management is the idea of 'supply chain'. It is used to explain the logistical and operational techniques concerned in taking the product from its foundation to the customer (Feller *et al.*, 2006).The focus, in this case, is not to analyze the creation of value, but to optimize the process.

One core idea developed in the mid-1990s is the worldwide commoditychain (GCC).Gereffi (1994) explains that global commodity chains are entrenched in production systems that give rise to particular patterns of coordinated trade.In these global chains, massive companies simultaneously participate in many various countries, not in a remote or phase fashion however as part of their global producing and distribution strategies.Global Commodity Chains have three main dimensions according to the framework proposed by Gereffi (1994): an input-output structure; territoriality; a governance structure. Gereffi (1994) puts governance in a prominent place within his analysis, identifying two distinct types of governance structures for Global Commodity Chains: producer-driven and buyer-driven commodity chains. The first form of governance (producer-driven) refers to chains in which transnational firms or other large integrated industrial companies play the central role in controlling production system linkages. The second case (buyer-driven) refers to chains in which large retailers and trading companies play a key role in setting up decentralized production networks in a variety of exporting countries around the world.

The notion of Global Commodity Chains laid the foundations for the concept of Global Value Chain (GVC), also developed by Gereffi, which outlines the role of governance in international production relations. It highlights the coordination of globally fragmented or disintegrated chains, which are at the identical time interlinked production systems.The role of dominant actors, or lead firms, in the coordination and design of institutional mechanisms of inter-firm relationships is a key element in the concept of Global Value Chains.In this global value chain perspective, power relationships, and records asymmetry are key principles in its evaluation (Faâe *et al.*, 2009; Trienekens, 2011). Gereffi *et al.* (2005) delivered an analytical framework made from five types of value chain governance. Each type depends essentially on the complexity of information required to sustain a particular transaction, the extent to which information can be codified, and the capabilities of actual and potential suppliers regarding the requirements of the transaction. Within the field of institutional analysis, some studies focus on the influence of institutional quality in the extent to which countries participate in global value chains (Dollar and Kidder 2017; Dollar *et al.*, 2016).The analysis made via Dollar and Kidder (2017) focuses on the reality that some chains are more complicated than others in the sense they're more contract-intensive; this implies a larger area for opportunistic behavior between actors working in unique hyperlinks of the value chain. In these more complex chains, institutional quality is important to boost participation in global markets.Dollar *et al.* (2016) find that correlation among institutional best and GVC participation is positive; this explains the truth that industries greater sensitive to institutions tend to have better participation in complex value chains in those international locations where institutions are greater solid. The authors consider the rule of law, government effectiveness, political stability, regulatory quality, and absence of violence/terrorism as variables that explain the institutional quality.

Finally, a relatively new line of thought related to the concept of value chain states that the traditional notion of the value chain may be, in some cases, very 'linear' (a series of interlinked successive stages).This traditional path to the idea may additionally lose a number of the richness of the horizontal and vertical linkages that coexist at the equal time inside the production relations (Coe *et al.*, 2008).The notion of the network gives the chance to complement the idea of a value chain in successive stages by capturing the complexity of current relations within economic sectors.

Agribusiness value chains assessment (AVCA)as a value chain:

$$\text{Maxmize AVCA}=\sum_{y1=1}^{Z1}(\text{Evy2-Evy1})+\sum_{y2=1}^{Z2}(\text{Evy4-Evy3}) \quad (1)$$

Z1 : Total amount of productions cultivated in the scheme of old land

Evy_1 : Amount value of production old land before adaptation tocompetition

Evy_2 : Amount value of production old land after adaptation tocompetition

Z2 : Total amount of productions cultivated in the scheme of new land

Evy_3 : Amount value of production new land before adaptation tocompetition

Evy_4 : Amount value of production new land after adaptation tocompetition

V : Total annual volume of water used in the scheme

Subject to

$$Qy = Ry \;.\; Ay \quad (2)$$

Q_y : Quantity of production y

R_y : Yield of production y

A_y : Area allocated to production y

Environmental agribusiness assessment (EAA)as a value chain:

$$\text{Minimize EAVCA}=\sum_{y1=1}^{Z1}(\text{Evy2-Evy1})+\sum_{y2=1}^{Z2}(\text{Evy4-Evy3}) \quad (3)$$

Z1 : Total amount of crop emission in cultivated in the scheme of old land

Evy_1 : Amount value of crop emission in old land before adaptation tocompetition

Evy_2 : Amount value of crop emission in old land after adaptation tocompetition

Z2 : Total amount of crop emission in cultivated in the scheme of new land

Evy_3 : Amount value of crop emission innew land before adaptation tocompetition Evy_4: Amount value of crop emission in new land after adaptation tocompetition

Subject to

$$Qy = Ry \,.\, Ay \tag{4}$$

Q_y : Quantity of crop emission in production y

R_y : Yield of crop emission in production y

A_y : Area allocated to production y

Environmentally extended input–output agribusiness analysis (EE-IOAA)as a value chain:

$$\text{Maxmize EE-IOAA}=\sum_{y1=1}^{Z1}(\text{Evy2-Evy1})+\sum_{y2=1}^{Z2}(\text{Evy4-Evy3}) \tag{5}$$

Z1 : Total amount of productions cultivated in the scheme of old land

Evy_1 : Economic value of production old land before adaptation to competition

Evy_2 : Economic value of production old land after adaptation to competition

Z2 : Total amount of productions cultivated in the scheme of new land

Evy_3 : Economic value of production new land before adaptation to competition

Evy_4 : Economic value of production new land after adaptation to competition

V : Total annual volume of water used in the scheme

Subject to

$$Evy = Qy \,.\, Py - Cy \tag{6}$$

$$Qy = Ry \,.\, Ay \tag{7}$$

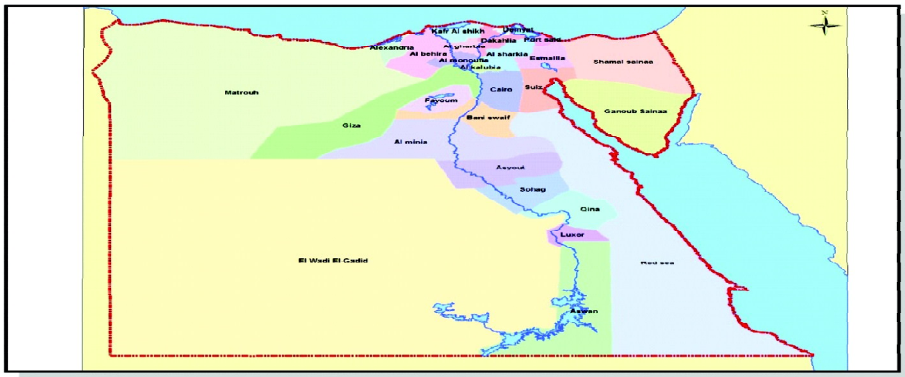
Q_y : Quantity of production y
R_y : Yield of production y
A_y : Area allocated to production y
P_y : Marketing price of production y
C_y : Production costs dedicated to production y

RESULTS AND DISCUSSION

Agribusiness value chains assessment (AVCA), environmental agribusiness value chains assessment (EAVCA) and environmentally extended input–output agribusiness analysis (EE-IOAA) as a value chainformulated as an analytical tool for applying the production value chain inside vintage and new lands of Egypt in the agriculture vicinity in Nile valley underneath the limitations of water resources in Egypt. The study area was the archaic lands of Egypt with a place of 2,149,252.56 hectares and located inside the Nile River Valley and Nile River Delta (MALR 2020),which contains thirteen governorates (Alexandria, Menoufia, Gharbia, Kafr El Sheikh, Ismailia, Dakahlia, Qaliubiya, Sharqia, Port Said, Suez, Damietta, El-Behaira, and Cairo) in the Nile River Delta and nine governorates (Giza, Beni Suef, Fayum, Assuit, Mania, Qena, Sohag, Luxor and Aswan) within the Nile River valley (figure 1). The old and new lands in the Nile Valley is the main area that cultivates in Egypt and is characterized by a pattern of cultivating crops for a complex year, where crops are cultivated over three consecutive cropping seasons; winter, summer, and nili. The Nile River is the main source of renewable and fresh surface water in Egypt. The economic and financial analysis and risks had been additionally studied, in addition to the inner annual rate of return for crop production.

Several steps have been followed to carry out Agribusiness value chains assessment (AVCA), environmental agribusiness value chains assessment (EAVCA) and environmentally extended input–output agribusiness analysis (EE-IOAA) as a value chain (Figure 2): The first step was the optimal cropping pattern for cultivating crops in winter in the vintage and new lands of Egypt. The second step was to simulate the optimal cropping pattern for Egypt. The third step was to simulate the most efficient cropping pattern in the place with the current cropping pattern (2014/2015-2016/2017) to reallocate crop acreage according to production and technical risk management.To fill within the model, field data reported by way of farmers was used.The vital data had been collected through a comprehensive survey and different inputs for crop fields on a winter season agriculture basis only, and a comprehensive data attached into connected to the agricultural status quo and its related socio-economic conditions. Crop area, yield, and

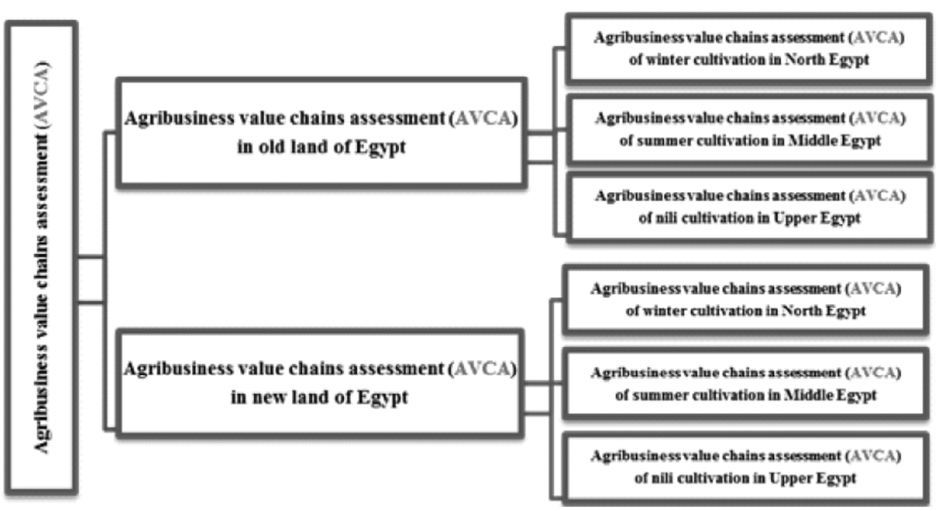
Figure 1: Nile River valley



Lower Egypt		Middle Egypt	Upper Egypt	Outside the Valley
Alexandria	Port Said	Giza	Assuit	New Valley
Gharbia	Sharkia	Beni Suef	Sohag	Matruh
Menoufia	Damietta	Fayum	Qena	South Sinai
Ismailia	Suez	Mania	Luxor	North Sinai
Kafr-El Sheikh	Behera		Aswan	Noubaria
Qalyoubia	Cairo			
Dakahlia				

Source: (Hamada 2020)

Figure 2: Structure model of Agribusiness value chains assessment (AVCA) as a value chain in Egypt



Source: (AVCA model 2020)

cost data were obtained from the Egyptian Ministry of Agriculture and Land Reclamation (MALR 2020), while water consumption data had been accumulated from the Egyptian Ministry of Water Resources and Irrigation (MWRI 2020).The necessary data associated with the cropping style enter of the different production structures had been accrued from primary sources and transformed into appropriate cropping style values.Greenhouse gas emissions were calculated and expressed per the energy input. The data presented in this research represented typical and/or average data recorded over the successive years of 2014/2015-2016/2017. Current cultivation and its assessment offered inside the place and the season in old and new lands are offered in Table 1, where the base year data is available to clarify the area crops and their area as well as cultivation assessment from their source (ECAPMS 2020).

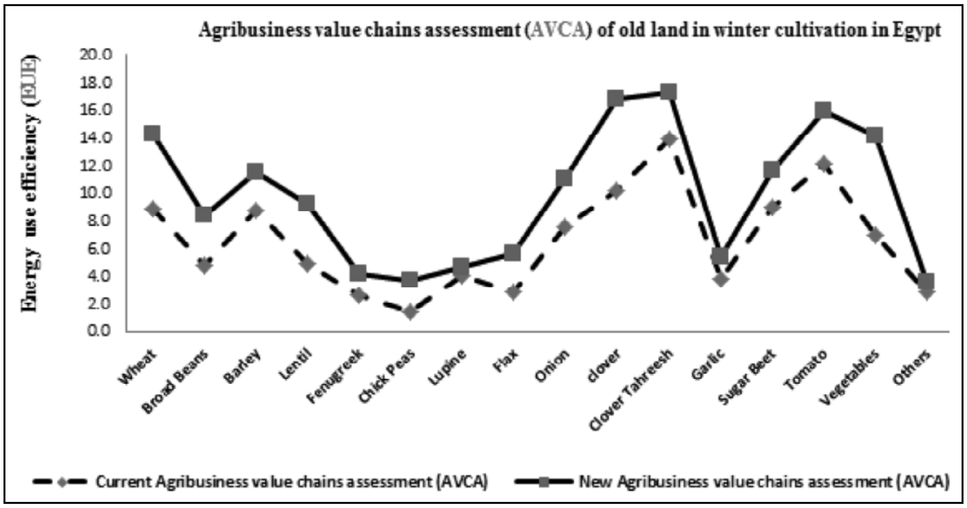
To assess the sustainability of agriculture, it's far might crucial to don't forget the water use efficiency within the farming system; water use efficiency can often be increased through reducing water use from inputs or through the method of growing outputs inclusive of crop production. To use technical hazard management it is able to be reallocated the land use to growth farm earnings; wherein the model changed into adjusted to the change in the land to accompany adjustments in soil and water type after laser leveling of the land within the vintage and new lands of Egypt.Table 2 shows the economic evaluations of optimal cultivation based totally on Agribusiness value chains assessment (AVCA) as a value chain and through the usage of laser land leveling of land in the vintage and new lands of Egypt and compared with the existing state of affairs in Egypt. Figures 3 and 4 illustrate changes in Agribusiness value chains in cultivation inside the area in wintry weather season from common 2014/ 2015-2016/2017 to Agribusiness value chain assessment (AVCA)inside the old lands of Egypt.And Figures 7 and 8 illustrate changes in Water footprint in cultivation in the place in wintry weather season from common 2014/2015-2016/2017 to Agribusiness value chains assessment (AVCA)inside the new lands of Egypt. Table 3 shows the economic evaluations of optimum cultivation based totally on environmental agribusiness value chains assessment (EAVCA) as a value chain and through the usage of laser land leveling of land within the antique and new lands of Egypt and compared with the current scenario in Egypt. Figures 5 and 6 illustrate changes in environmental agribusiness value chains in cultivation inside the region in wintry weather season from common 2014/2015-2016/2017 to environmental agribusiness value chains assessment (EAVCA) in the old lands of Egypt. And Figures 9 and 10 illustrate modifications in environmental agribusiness in cultivation

Table 1
Changes area in winter cultivation of old and new land of Egypt flow values from the mean 2014/2015-2016/2017 to AVCA (Bold is values that have increased, Not-bold are values that have decreased)

Winter cultivation in old land of Egypt				
	Mean	***AVCA***	*Change*	*%*
Wheat	997376.100	**1154964.300**	**157588.2**	**15.80**
Broad Beans	32374.860	19782.420	-12592.4	-38.90
Barley	4243.680	**4642.680**	**399.0**	**9.40**
Lentil	1054.200	596.820	-457.4	-43.39
Fenugreek	1090.320	**1425.480**	**335.2**	**30.74**
Chick Peas 1781.64	1781.640	531.720	-1249.9	-
Lupine	78.120	**196.560**	**118.4**	**151.61**
Flax	5922.000	3116.400	-2805.6	-47.38
Onion	59165.400	52599.540	-6565.9	-11.10
clover	573769.140	488641.020	-85128.1	-14.84
Clover Tahreesh	84055.860	**91413.840**	**7358.0**	**8.75**
Garlic	9862.020	9459.660	-402.4	-4.08
Sugar Beet	159618.480	**177925.860**	**18307.4**	**11.47**
Tomato	28521.360	**28990.920**	**469.6**	**1.65**
Vegetables	167976.480	**170641.380**	**2664.9**	**1.59**
Winter cultivation in new land of Egypt				
	Mean	***AVCA***	*Change*	*%*
Wheat	304816.680	236527.20	-68289.48	-22.40
Broad Beans	17001.600	**20608.98**	**3607.38**	**21.22**
Barley	34781.040	**84106.68**	**49325.64**	**141.82**
Lentil	15.120	0.00	-15.12	-100.00
Fenugreek	530.880	282.66	-248.22	-46.76
Chick Peas **27900.00**	0.420	**117.60**	**117.18**	
Lupine	136.920	0.00	-136.92	-100.00
Flax	10.500	**128.94**	**118.44**	**1128.00**
Onion	26946.780	19201.56	-7745.22	-28.74
clover	56476.140	**184799.58**	**128323.44**	**227.22**
Clover Tahreesh	4371.780	3517.920	-853.860	-19.531
Garlic	3123.960	**3155.04**	**31.08**	**0.99**
Sugar Beet	55149.360	**60201.96**	**5052.60**	**9.16**
Tomato	49605.780	42407.400	-7198.380	-14.511
Vegetables	116895.240	101933.58	-14961.66	-12.80

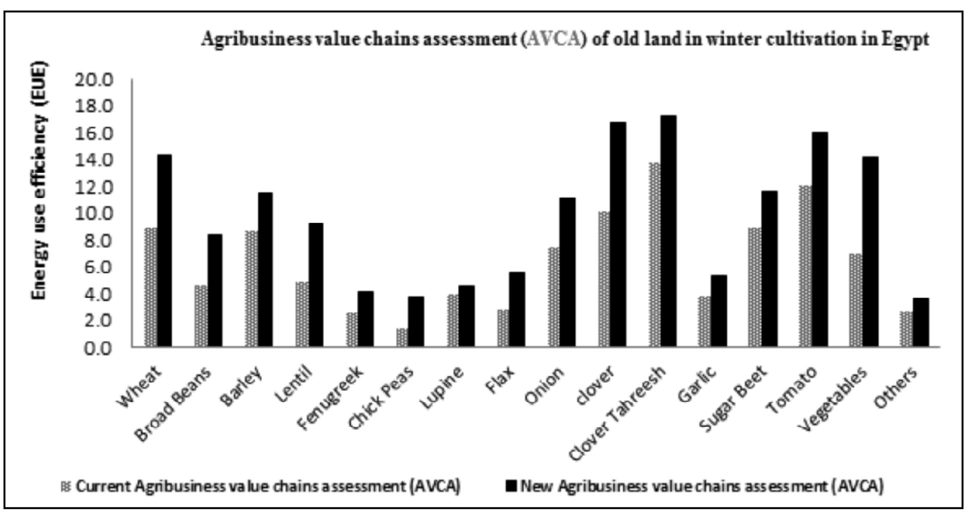
Data source: (1) MALR (2020) (2) AVCA model (2020) (3) ECAPMS, (2020)

Figure 3: Changes Agribusiness value chains assessment (AVCA) from 2014/2015-2016/2017 to AVCA



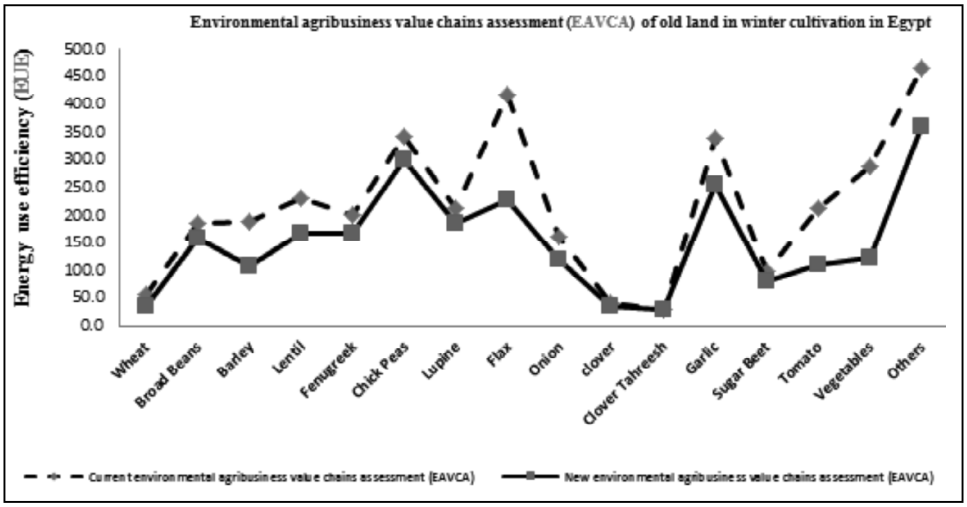
Data source: (1) MALR (2020) (2) AVCA model (2020) (3) ECAPMS, (2020)

Figure 4: Changes Agribusiness value chains assessment (AVCA) from 2014/2015-2016/2017 to AVCA



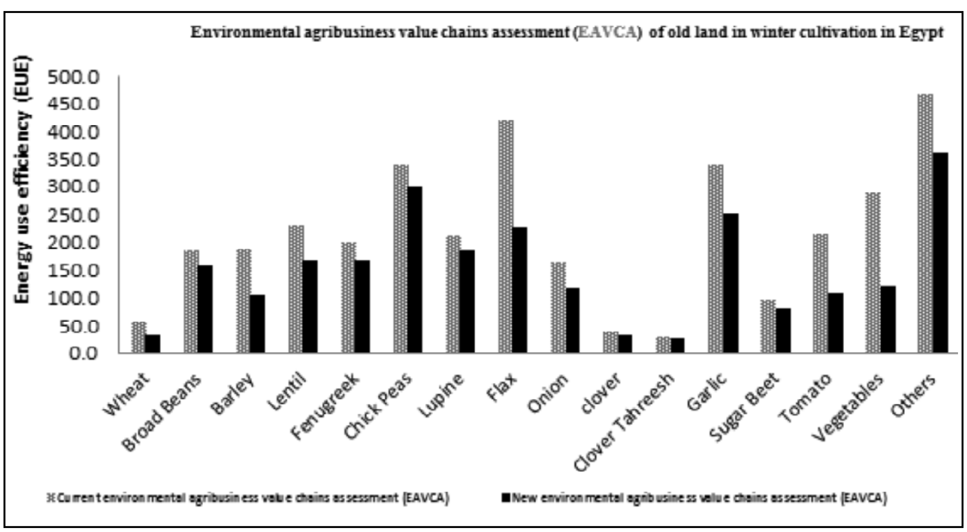
Data source: (1) MALR (2020) (2) AVCA model (2020) (3) ECAPMS, (2020)

Figure 5: Changes environmental agribusiness assessment (EAVCA) from 2014/2015-2016/2017 to EAVCA



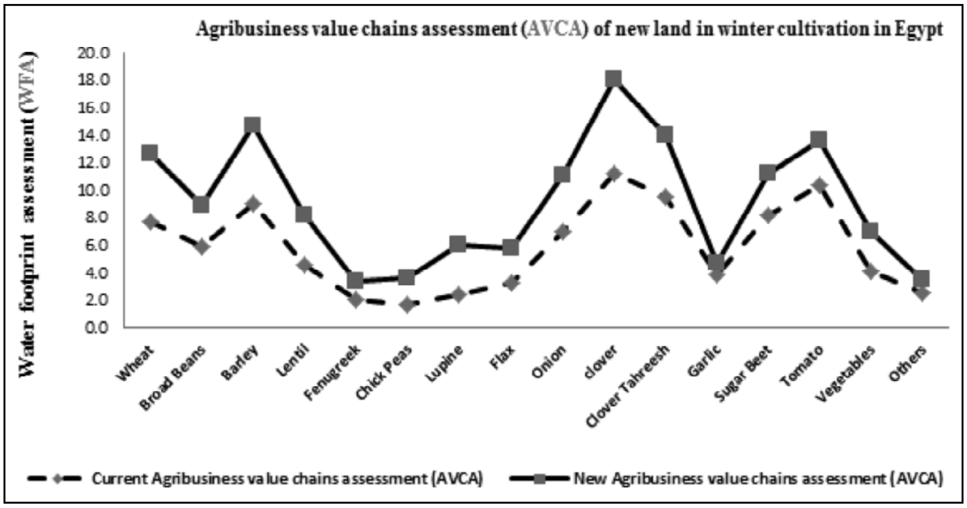
Data source: (1) MALR (2020) (2) AVCA model (2020) (3) ECAPMS, (2020)

Figure 6: Changes environmental agribusiness assessment (EAVCA) from 2014/2015-2016/2017 to EAVCA



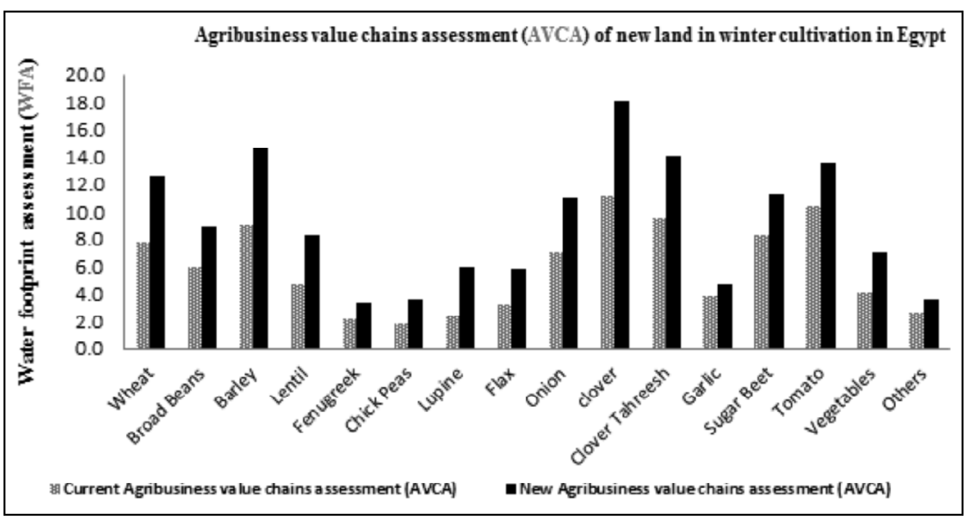
Data source: (1) MALR (2020) (2) AVCA model (2020) (3) ECAPMS, (2020)

Figure 7: Changes Agribusiness value chains assessment (AVCA) from 2014/2015-2016/2017 to AVCA



Data source: (1) MALR (2020) (2) AVCA model (2020) (3) ECAPMS, (2020)

Figure 8: Changes Agribusiness value chains assessment (AVCA) from 2014/2015-2016/2017 to AVCA

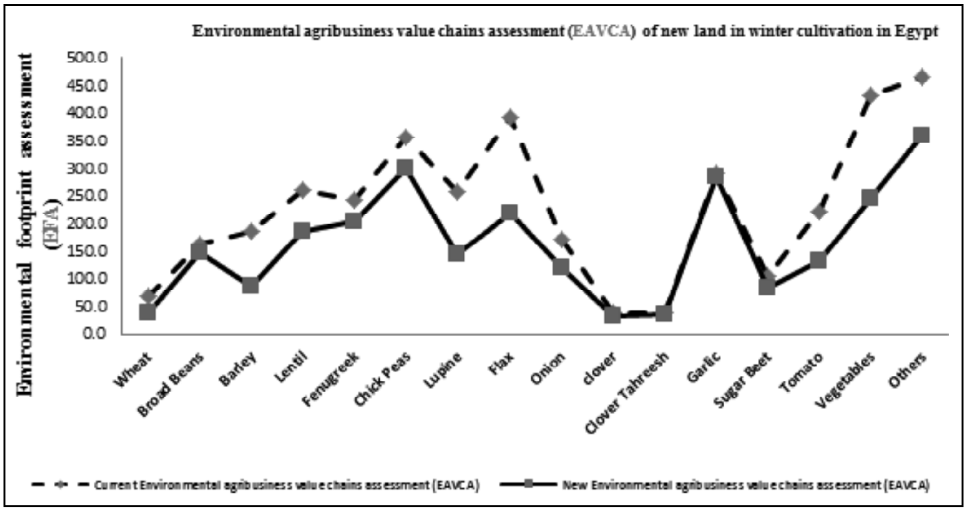


Data source: (1) MALR (2020) (2) AVCA model (2020) (3) ECAPMS, (2020)

in the region in wintry weather season from common 2014/2015-2016/2017 to environmental agribusiness EAVCAwithin the new lands of Egypt.Table 4 shows the environmental evaluations of optimal cultivation primarily based on environmentally extended input–output agribusiness analysis (EE-IOAA) as a value chainand through the use of laser land leveling of land within the vintage and new lands of Egypt and was comparedwith the current scenario in Egypt. Figures 5 and 6 illustrate adjustments in environmentally prolonged enter–output analysis in cultivation within the area in wintry climate season from common 2014/2015-2016/2017 to environmentally extended input–output agribusiness analysis (EE-IOAA) in the old lands of Egypt.And Figures 9 and 10 illustrate changes in environmentally extended input–output analysis in cultivation in the area in wintry climate season from common 2014/2015-2016/2017 to environmentally extended input–output agribusiness analysis (EE-IOAA) in the new lands of Egypt. The environmental agribusiness value chain assessment (EAVCA)as a value chain supplied much less greenhouse fuel emissions than the present model for all agricultural operations, in which pollutants cause harm to the ecosystem, structures, and human health. The social value according to a ton of greenhouse gas emissions and air pollutants was calculated to obtain data at the ideal use of water in old and new lands in Egypt.

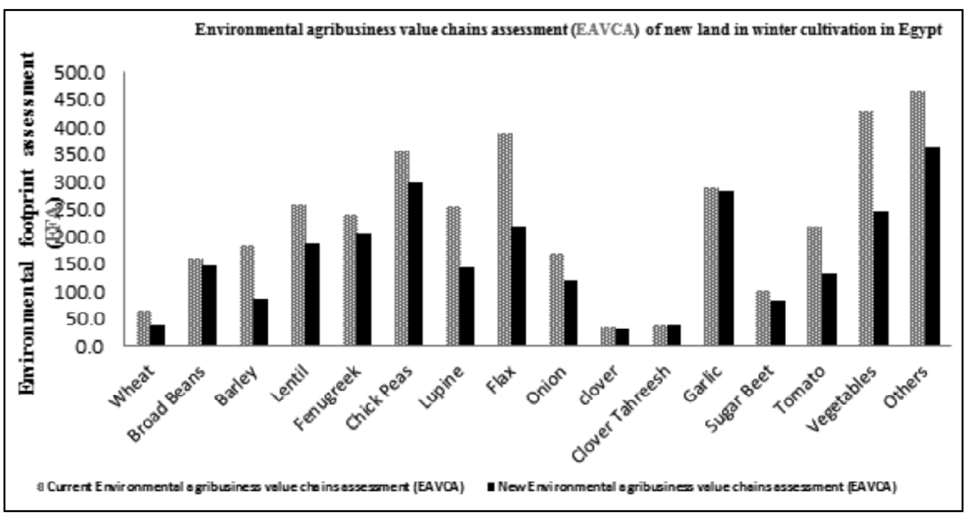
The results in Table 2 confirmed that the whole water consumption for optimum cultivation decreased by means of 28.159 and 28.181% within the old and new lands of Egypt and that the overall place of crops could be 931749.034 and 319914.983 hectares planted within the vintage and new lands in Egypt, in addition to the predicted model presents a higher net benefit than the current model. The general net profit of the heterogeneous case become 186530.800 and 69395.275 million EP higher than the full of the homogeneous case (166259.954 and 20074.227 million EP) after applying the model, further to the overall cost of crops in heterogeneous case 40629.067 and 13102.565 million EP that did no longer reach the full homogeneous case (34968.102 and 8436.099 million EP).This end result may additionally suggest that the difference between the heterogeneous instances had a large impact on the most optimal solution. According to pecuniary and economic analyzes in Table 3, the internal annual rate of return (IRR) became higher than the present model of the zone and elevated by 14.98 and 118.32% in the old and new lands of Egypt, and the absolute risk of optimal cultivation is decreased by way of 23.31 and 65.61%. For this reason, the Agribusiness value chain assessment (AVCA) as a value chain may be applied in the agriculture sector inside the land of Egypt.Finally, farmers must level the land through laser because it is the

Figure 9: Changes environmental agribusiness assessment (EAVCA) from 2014/2015-2016/2017 to EAVCA



Data source: (1) MALR (2020) (2) AVCA model (2020) (3) ECAPMS, (2020)

Figure 10: Changes environmental agribusiness assessment (EAVCA) from 2014/2015-2016/2017 to EAVCA



Data source: (1) MALR (2020) (2) AVCA model (2020) (3) ECAPMS, (2020)

Table 2
Changes area and energy consumption in winter cultivation of old and new land in Egypt flow values from the mean 2014/2015-2016/2017 to AVCA (Bold is values that have increased; Not-bold are values that have decreased)

Winter cultivation in old land of Egypt

	Mean	***AVCA***	*Change*	*%*
Irrigated area of crop in old land	2149252.6	**2218450.1**	**69197.5**	**3.2**
Crop revenue	190051.6	**247809.7**	**57758.1**	**30.4**
Crop profit	166260.0	**186530.8**	**20270.8**	**12.2**
Crop production cost	34968.1	**40629.1**	**5661.0**	**16.2**
Labor Wages	5488.8	**6723.4**	**1234.6**	**0.0**
Other Expenses (Labor Wages)	1257.5	**1696.3**	**438.9**	**34.9**
Crop water consumption	12350.5	8872.7	-3477.8	-28.2
Kerosene fuel million tons	3212.7	2532.9	-679.8	-21.2
Energy consumption in cultivation TJ	100.8	76.9	-23.8	-23.7
Main crop yield	98.5	**128.9**	**30.4**	**30.9**
Secondary crop yield	33.0	**43.1**	**10.2**	**30.8**
Main crop price	7947.8	**10282.3**	**2334.4**	**29.4**
Secondary crop price	494.7	**509.4**	**14.7**	**3.0**
Manure	514.1	**927.6**	**413.5**	**80.4**
Fertilizers	2195.0	**3002.0**	**807.0**	**36.8**

Winter cultivation in new land of Egypt

	Mean	***AVCA***	*Change*	*%*
Irrigated area of crop in old land	1613.1	**1813.6**	**200.5**	**12.4**
Crop revenue	32119.9	**93410.7**	**61290.7**	**190.8**
Crop profit	20074.2	**69395.3**	**49321.0**	**245.7**
Crop production cost	8436.1	**13102.6**	**4666.5**	**55.3**
Labor Wages	1967.5	**2224.7**	**257.2**	**13.1**
Other Expenses (Labor Wages)	447.6	**539.8**	**92.2**	**20.6**
Crop water consumption	4170.5	2995.2	-1175.3	-28.2
Kerosene fuel million tons	1400.8	1080.7	-320.1	-22.8
Energy consumption in cultivation TJ	37.7	27.0	-10.8	-28.5
Main crop yield	23.9	**40.6**	**16.7**	**70.0**
Secondary crop yield	10.5	**12.0**	**1.6**	**14.8**
Main crop price	1890.3	**3741.4**	**1851.1**	**97.9**
Secondary crop price	144.9	139.9	-5.0	-3.4
Manure	200.3	**279.7**	**79.4**	**39.6**
Fertilizers	802.2	**940.2**	**138.0**	**17.2**

Data source: (1) MALR (2020) (2) AVCA model (2020) (3) ECAPMS, (2020)

Table 3
Changes in the economic and financial values for the winter season in the old and new land in Egypt flow values from the mean 2014/2015-2016/2017 to AVCA (Bold is values that have increased, Not-bold are values that have decreased)

Winter cultivation in old land of Egypt				
	Mean	*AVCA*	*Change*	*%*
Irrigated area of crop in old land	2149252.6	**2218450.1**	**69197.5**	**3.2**
Main crop yield	98.5	**128.9**	**30.4**	**30.9**
Secondary crop yield	33.0	**43.1**	**10.2**	**30.8**
Main crop price	7947.8	**10282.3**	**2334.4**	**29.4**
Secondary crop price	494.7	**509.4**	**14.7**	**3.0**
Crop revenue	190051.6	**247809.7**	**57758.1**	**30.4**
Crop profit	166260.0	**186530.8**	**20270.8**	**12.2**
Crop production cost	34968.1	**40629.1**	**5661.0**	**16.2**
Labor Wages	5488.8	**6723.4**	**1234.6**	**0.0**
Other Expenses (Labor Wages)	1257.5	**1696.3**	**438.9**	**34.9**
Rate of return (IRR)	4.43	**5.10**	**0.66**	**14.98**
Absolute Risk	21.49%	**16.48%**	**-5.01%**	**-23.31**
Winter cultivation in new land of Egypt				
	Mean	*AVCA*	*Change*	*%*
Irrigated area of crop in old land	1613.1	**1813.6**	**200.5**	**12.4**
Main crop yield	23.9	**40.6**	**16.7**	**70.0**
Secondary crop yield	10.5	**12.0**	**1.6**	**14.8**
Main crop price	1890.3	**3741.4**	**1851.1**	**97.9**
Secondary crop price	144.9	139.9	-5.0	-3.4
Crop revenue	32119.9	**93410.7**	**61290.7**	**190.8**
Crop profit	20074.2	**69395.3**	**49321.0**	**245.7**
Crop production cost	8436.1	**13102.6**	**4666.5**	**55.3**
Labor Wages	1967.5	**2224.7**	**257.2**	**13.1**
Other Expenses (Labor Wages)	447.6	**539.8**	**92.2**	**20.6**
Rate of return (IRR)	2.81	**6.13**	**3.32**	**118.32**
Absolute Risk	134.93%	**46.40%**	**-88.53%**	**-65.61**

Data source: (1) MALR (2020) (2) AVCA model (2020) (3) ECAPMS, (2020)

best -solution technique to the Egyptian question, as its miles low-cost (261.904 EP) for each with hectare in Egypt.

Table 4
Changes in crop emissions of the winter season in the old and new land in Egypt flow values from the mean 2014/2015-2016/2017 to AVCA (Bold is values that have increased; Not-bold are values that have decreased)

Winter cultivation in old land of Egypt				
	Mean	***AVCA***	*Change*	%
NO_x	1.600	**1.261**	**-0.339**	**-21.160**
SO_2	7.720	**6.087**	**-1.634**	**-21.160**
CO_2	7760.600	**6118.49**	**-1642.1**	**-21.160**
SO_3	nugatory	**nugatory**		**nugatory**
CO	2.466	**1.944**	**-0.522**	**-21.160**
CH	nugatory	**nugatory**		**nugatory**
SPM	nugatory	**nugatory**		**nugatory**
Winter cultivation in new land of Egypt				
	Mean	***AVCA***	*Change*	%
NO_x	0.698	**0.538**	**-0.159**	**-22.849**
SO_2	3.366	**2.597**	**-0.769**	**-22.849**
CO_2	3383.846	**2610.661**	**-773.19**	**-22.849**
SO_3	nugatory	**nugatory**		**nugatory**
CO	1.075	**0.830**	**-0.246**	**-22.849**
CH	nugatory	**nugatory**		**nugatory**
SPM	nugatory	**nugatory**		**nugatory**

Data source: (1) MALR (2020) (2) AVCA model (2020) (3) ECAPMS, (2020)

CONCLUSION

Within the value chain analysis, how much value is created is cannot be avoided, and how it is distributed. This is an extra accounting point of view, and we titled it a value assessment approach. Particularly for the context of agribusiness chains, the question of how much value each actor creates, and how it gets is on the constant discussion.Since the main characteristic of agri-food chains is the different farm and at farm gate market structures, where primary stages show aspects of competition while industry and distribution tend to show degrees of market power, this conducts frequent conflicts between actors. Being able to develop indicators in this regard, helps to better understand and tackle those conflicts. Where development organizations have been playing a central role enriching the body of point of view. Mainly with intervention objectives and with the aim of giving their technicians a tool to work with value chain actors, there has been a proliferation of manuals and guidelines. This is important particularly to the agri-food sector, as developing countries enter into food global value chains as primary producers, in most cases with scarce or none value-added, and showing poor conditions for the actors involved.

Having obtained these tools, approaches, and point of views that operate as methodological frameworks for the analysis of agribusiness value chains, and with a better understanding of the multidimensional aspects of the concept, further analysis should be oriented to develop mathematical framework models and objective indicators to measure competitiveness and performance in agribusiness value chains. Where the aim of this research is to compare three methods of trace competitiveness and performance in agribusiness value chains. The effects of Agribusiness value chains assessment (AVCA), environmental agribusiness value chains assessment (EAVCA) and environmentally extended input-output agribusiness analysis (EE-IOAA) as a value chain confirmed that the entire water consumption for maximum cultivation reduced by 28.159 and 28.181% inside the old and new lands of Egypt and that the overall region of crops is probably 931749.034 and 319914.983 hectares planted within the antique and new lands of Egypt, in addition to the anticipated model presents a higher net benefit than the current model. The general net profit of the heterogeneous case emerges as 186530.800 and 69395.275 million EP better than the full of the homogeneous case (166259.954 and 20074.227 million EP) after applying the model, further to the entire cost of crops in heterogeneous case 40629.067 and 13102.565 million EP that did not reach the total homogeneous case (34968.102 and 8436.099 million EP). This end result may additionally imply that the distinction among the heterogeneous instances had a massive impact on the optimal solution. According to financial and economic analyzes, the inner annual rate of return (IRR) became better than the current model of the area and increased by 14.98 and 118.32% within the vintage and new lands of Egypt, and the absolute risk of optimal cultivation is decreased by 23.31 and 65.61%. For this reason, the Agribusiness value chain assessment (AVCA) as a value chain can be applied in the agriculture sector within the land of Egypt.

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