

INFLUENCE OF SOCIO-ECONOMIC FACTORS OF FARMERS ON PALM OIL AND PALM KERNEL PRODUCTION IN ENUGU AND KOGI STATES

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Abstract

The study examined the influence of socio economic factors of farmers on palm oil and palm kernel production in Enugu and Kogi States, Nigeria. Purposive and simple random sampling techniques were adopted in the study. Enugu and Kogi States were purposively selected based on the *a priori* knowledge that they are palm oil and palm kernel producing States. The agricultural zones producing palm oil and palm kernel were considered from each State. Finally, a list of palm oil producers under oil palm growers' association of Nigeria (OPGAN) in each State was obtained from the State Ministry of Agriculture. From the list, 33% of the farmers were randomly selected from each of the villages sampled to give a total sample size of 473 farmers interviewed. However, only 457 questionnaires were correctly filled, returned and used for the analysis. Primary data used for the study was collected through the use of structured questionnaire. Both descriptive and inferential statistics were used to analyze data collected for the study. Descriptive statistics such as mean, frequency and percentage, and inferential statistics (Stochastic frontier model). Analysis of sex of respondents conducted per State indicated that 61% of the respondents were female and 39% were male in Enugu State while 59% were female and 41% male in Kogi State. The study revealed the average age of the respondents as 45.5 years, and that majority of them were married 73.5% and 75.7% in Enugu and Kogi States respectively. Also, the study showed that 53% and 74.7% of the farmers in Enugu and Kogi States respectively had household size of 5-9 persons, while 19.6% and 16.8% had household size 10-14 persons. Only 12% has household size of 20 persons and above in the two states. The mean educationally years spent in school by the respondents from the study areas was found to be 10 years. Specifically, in Enugu State, 21.9% had no formal education while 10.39% had no formal education in Kogi State. Meanwhile 78.3% and 80.6% had formal education in the two States respectively. From the study, it was revealed that although producers were generally efficient, there is still room to

increase their production; whereas sex and household size were not significant, and producers with more years of formal schooling tend to be more efficient and closer to the frontier output. Variables such as quantities of fresh fruit bunches and labor have significant effect on palm oil and palm kernel production at 1% probability level. In conclusion, the study recommended establishment of more oil palm plantation, formation of farmers' cooperative societies, and rural development; these are efforts to encourage young farmers to produce more since the enterprise is a very lucrative one in the study areas but the farmers were seen producing in small scale.

Keywords: Socio economic, farmers, palm oil, palm kernel

Introduction

Palm oil and palm kernel are edible substances derived from the fruits of oil palm. They are ingredients in many consumer products as well as important raw materials for both food and non - food industries. The palm kernel has two distinct oils; the outer part of the kernel yields the palm oil, extracted from the pulp of the oil palm fruit, while the inner part of the kernel yields the palm kernel oil which is extracted from the kernel. Palm oil and palm kernel were major commodities for export and source of foreign exchange to Nigeria as well as income to the people of the defunct South East, Nigeria. Palm kernel, a by-product of palm oil is consequently produced at the same time palm oil is produced; from the same process. Dada (2007) noted that prior to the discovery of crude petroleum oil, Nigeria earned foreign exchange substantially from palm oil and palm kernel exports which helped to fund some national development programmes. During that time, palm oil and kernel production was at its peak, the country enjoyed a global market share of 43% and produced about 645,000 metric tons of palm oil annually making it the highest producer of the commodities. This supported the classical theories of international trade that countries should produce and export what they have cost or factor advantage over another country. This buttressed Adeyemo (2015) who opined that Nigeria has a comparative advantage in the production of agricultural commodities with its level of technology. However, after independence, Nigeria liberalized her economy, abolished commodity marketing boards, removed subsidies and engaged in World Bank Structural Adjustment Programmes (SAP), these affected smallholders' agriculture who were the major producers of palm oil and palm kernel at that time. Oil World (2016) noted that Nigeria produced 0.94 million metric tons of palm oil which is about 1.5% of global palm oil production in 2015, while Indonesia (53.3%) and Malaysia (32%) took the lead in palm oil production. USDA (2018) however noted that, in

Nigeria, the sector has since witnessed a downturn with contribution to global market share tapering to a meager 1.4% as at 2018.

This decline in palm oil sector has resulted in loss of foreign exchange earnings, loss of raw materials for agro-allied industries, loss of employment and reduced livelihoods to the rural populace. Gourichon (2013) opined that Nigeria's aim and objective is to meet the domestic demand before seeking to compete in the international market. Since the Human Development Index (HDI) emphasized that people and their capabilities should be the ultimate criteria for assessing the development of a country and not economic growth alone, the argument therefore is on whether farmers' socio economic characteristics affect the technical efficiency of palm oil and palm kernel output, as well as has any implication on the farmers' well-being.

The following research questions were generated to guide the study:

- i) What are the socio economic characteristics of the respondents in the study areas?
- ii) What are the influence of the socio-economic characteristics of respondents on the technical efficiency of palm oil and palm kernel output in the study areas?

Methodology

The study was conducted in Enugu and Kogi States, Nigeria. Omoti (2011) noted that 24 out of the 36 states of the Federation engage in palm oil and palm kernel production among which are Enugu and Kogi States. Enugu state is a state in the southeastern part of the country created in 1991 from the old Anambra state. It is also known as the Coal City State with its capital at Enugu, bounded in the north by Kogi and Benue States, Ebonyi State to the east, Abia and Imo States to the south and Anambra to the west. The state has seventeen local government areas among which are; Aninri, Awgu, Enugu East, Enugu North, Enugu South, Ezeagu, Igbo Etiti, Igbo Eze North, Igbo Eze South, Isi Uzo, Nkanu East, Nkanu West, Nsukka, Oji River, Udenu, Udi, and Uzo Uwani.

Kogi State is a state in the north central region of Nigeria, popularly called the Confluence State. It has its capital at Lokoja, and was created in 1991 from the portion of eastern Kwara and western Benue States. The state shares boundaries with Plateau, Niger, Nassarawa and the Abuja FCT in the north, Benue to the east, Anambra, Enugu and Delta states to the south while it is bordered in the west by Ondo, Edo, Ekiti and Kwara states. There are twenty-one local government areas in Kogi State, namely; Adavi, Ajaokuta, Ankpa, Bassa, Dekina, Ibaji, Idah, Igalamela/Odolu, Ijumu, Kabba-Bunu, Kogi, Lokoja, Mopamuro, Ofu, Ogori-Magongo, Okene, Okehi, Olamaboro, Omala, Yagba East and Yagba West.

The population for this study consisted of the palm oil and palm kernel producers in Enugu and Kogi States, Nigeria. Purposive and simple random sampling techniques were adopted in the study. In the first stage, two States (Enugu and Kogi) out of twenty-four palm oil producing States in Nigeria were purposively selected based on the *a priori* knowledge that these States are palm oil and palm kernel producing States. The choice of these two States was based on variations in the two ecological zones, Enugu State in the south-east and Kogi State in the north central yet there is high intensity of palm oil and palm kernel production in the areas. Also, Enugu and Kogi States were chosen because of their proximity to one another, and proximity to the researcher. In the second stage, the major agricultural zones producing palm oil and palm kernel were considered in each State. In Enugu State, three agricultural zones (Udi, Nsukka and Agbani) were randomly selected from the six agricultural zones that make up the State while two agricultural zones (Zone B and Zone D) were randomly selected from the four agricultural zones that make up Kogi State making it a total of five agricultural zones sampled. Using a constant sampling fraction of 50%, two Local Government Areas were randomly selected from Udi, Agbani, Nsukka, and Zone B agricultural zones while three Local Government Areas were randomly selected from Zone D agricultural zone to give a total of eleven Local Government Areas sampled. In the third stage using a sample fraction of 80%, two villages from each of the Local Government Areas were randomly sampled giving a total of twenty-two villages. Finally, a list of palm oil producers under the Oil Palm Growers Association of Nigeria (OPGAN) in each State was obtained from the State Ministry of Agriculture and Rural Development. From the list, 33 percent of the farmers from each of the twenty-two villages sampled were randomly selected to give a total sample size of 473 farmers interviewed, 270 from Enugu State and 203 from Kogi State.

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Table 1 : Sample Size

States	Agric. Zones	L.G.A	Villages	Sample frame	Sample size
1. Enugu	Agbani	Nkanu West	Akegbe Ugwu and Ozalla	100	33
		Nkanu East	Amagunze , Nkrefi	110	36
	Udi	Udi	Obinagu and Umuabi	84	27
		Oji River	Inyi and Achi	120	39
	Nsukka	Udenu,	Obollo Afor, Amankpu Ibeagwa	185	61
		Nsukka	Ibagwani, Eha Alumona	226	74
2. Kogi	Zone B	Dekina,	Egume and Ochaja	184	60
		Omala	Abejukolo, Ogodu	150	49
	Zone D	Olamaboro	Adupi Afo, Alugu Emonoja	150	49
		Ofu	Ejule and Aloma	80	26
		Igalamela	Odolu, Ofarachi	57	19
Total	5	11	22	1446	473

Source: Author's computation , 2020

Primary data for this research were collected by the use of a well-structured questionnaire. Section A: socioeconomic characteristics of the respondents in the study areas, and section B: influence of socio-economic characteristics of the respondents on the technical efficiency of palm oil and palm kernel output in the study areas. Descriptive statistics was used to analyze research question 1 while stochastic frontier model was used to analyze research question 2.

Results and Discussions

Socio-Economic Characteristics of Respondents

The socio-economic characteristics of respondents studied include: sex, age, marital status, household size, educational background, quantity of palm fruits harvested and annual income. Analysis of sex of respondents conducted per State indicated that majority of them (60.7 percent) were female while (39 percent) were male in Enugu State, also in Kogi State, 59 percent were female while 40.5 percent were male. Taking the average percentage of the two States, it showed that majority of the respondents in the study areas were female (60 percent) while (40 percent) were male. This implied that palm oil and palm kernel production is mostly carried out by the female folk in the study areas. Findings of this study

is in line with that of Ajani, Onwuba and Nwalieji (2012) and Nwandu (2020) which noted that women in the communities are responsible for the processing and sale of oil palm produce in the study area and also in consonant with the findings of Ukwuteno (2017) who found out that 89.1% of small scale palm oil producers were female in the study area.

Specifically, in Enugu State, 33.3 percent of the respondents were in the productive age group of 40 to 49 years; 15.6 percent were within the age group of 20 to 29 years; 29 percent were in the age group of 30 to 39 years; 17.6 percent of the respondents fall between the age group of 50-59; and 4 percent were in the age group of 60 years and above. Also, in Kogi State, 31.6 percent of the respondents were in the age group of 40-49, 27 percent represent the age group of 30-39. On the average, 32 percent of the farmers fall between the age group of 40-49 in the study areas. The average age of respondents was found to be 45.5 years in the study areas; it is evident that the concentration of age distribution is between 41 and 60 years. This is in line with the findings of Ukwuteno (2017) who found mean age of small scale palm oil producers in the study area to be 48 years. This implied that they are agile and stronger farmers in the study areas.

Result on marital status indicated that in Enugu and Kogi States, majority of the farmers 73.7 percent and 75.7 percent respectively were married; 9.8 percent were single; 8.6 and 5 percent were divorced in the two States while 7.8 and 9.4 percent were widows/widowers. Since majority of palm oil and palm kernel producers were married, there is a tendency that the farmers are more stable as marriage guarantees stability in their activities which may lead to increased production. This result is in variance with the findings of Nwandu (2020) who found 89.1% of small scale oil palm producers in the study area married.

Specifically, the study revealed that 53 percent and 74.7 percent of the respondents had household size of 5 to 9 in Enugu and Kogi States. 19.6 and 16.8 percent had household size of 10 to 14; 14.9 and 6.9 percent had household size of 15 to 19 in the two States respectively while 12 percent had household size of 20 and above. The average household size of the farmers was found to be 10 persons. This implied that there is enough family labor for palm oil and palm kernel production in the study areas. This is slightly above the findings of Adegeye and Adegeye (2000) who found average size of farmers' household of 8 persons for palm oil producers in the study area and in line with Ogundele and Okoruwa (2006) who found household size of palm oil producers in the South Western Nigeria to be 10 persons.

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Specifically, in Enugu and Kogi States, 21.9 and 10.39 percent had no formal education; 23.5 and 30.6 percent had primary education; 45.88 and 47 percent had secondary education while 9 and 11 percent had tertiary education respectively. The mean educational background was found to be 10 years spent in school. This implied that majority of palm oil and palm kernel producers were literate enough to adopt new technologies for their production.

The study further revealed that the average years of experience in palm oil and palm kernel production was 12 years. This finding is different from the findings of Ogundele and Okoruwa (2006) who found 15 years to be the mean years of experience of oil palm farmers in South Western Nigeria. Specifically, 39 and 33 percent of the respondents have gained experience in palm oil and palm kernel production from 12-15 years in Enugu and Kogi States respectively.

The result also showed that average annual income was found to be N584,500. This amount may be due to relative small size of the farm cultivated by most respondents in the study areas. Specifically, 19.6 percent and 13.8 percent had annual income of N100,000 to N299,000 in Enugu and Kogi States; 26.6 and 24.7 percent had annual income of N300,000 to N499,000 respectively; 22.7 percent and 19.8 percent had annual income of N500,000 to N699,000 in the two States; 13 and 21 percent had annual income of N700,000 to N899,000 while 18 percent had annual income of N900,000 and above. This implied that palm oil and palm kernel production and processing attract a reasonable annual income in the study areas, but this is different from the findings of Etoamaihe and Ndubueze (2010) who found out that (43.3%) of the respondents had annual income from palm oil sale of between N 151,000- N 200,000, while the mean annual income was N 163,417.

The result of main occupation of respondents showed that majority 49.8 percent and 60.8 percent of the respondents were farmers in Enugu and Kogi States respectively, 3.9 percent and 10.8 percent were civil servants, 31 and 17.8 percent were involved in merchandise, 11 and 8.9 percent respectively were in private paid employment while 3.5 and 1 percent were involved in other forms of occupation respectively in Enugu and Kogi States.

The result further revealed that 31 percent and 23 percent of the respondents in Enugu and Kogi States harvested FFB of ≥ 80 . 35 percent and 38.6 percent of the respondents in the two study areas harvested 80-150 FFB, while 24 percent of the respondents from the two States harvested from 151-300 FFB. Only 10 percent of the respondents from Enugu

and 13.5 percent from Kogi State harvested above 300 FFB. The study revealed that the harvested Fresh Fruit Bunches from the farm during the peak season of production were up to 80-500 heads; this implied that the farmers are small scale producers whose farm sizes are small.

Table 2: Distribution of Respondents according to their Socio-Economic Characteristics

S/N	Variables/Categories	Frequency		Percentage (%)	
		Enugu	Kogi	Enugu	Kogi
Sex					
	Male	100	82	39	40.5
	Female	155	120	60.7	59
	Total	457		100	
Age (years)					
	20-29	40	24	15.8	11.8
	30-39	75	55	29	27
	40-49	85	64	33	31.6
	50-59	45	30	17.6	14.8
	≥ 60	10	29	3.9	14
	Total	457		100	
Marital Status					
	Married	188	153	73.7	75.7
	Single	25	20	9.8	9.9
	Divorced	22	10	8.6	4.95
	Widow/Widower	20	19	7.8	9
	Total	457		100	
Households Size					
	5-9	136	151	53.3	74.7
	10-14	50	34	19.6	16.8
	15-19	38	14	14.9	6.9
	≥20	31	03	12	1.48
	Total	457		100	

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Educational Background				
No formal education	56	21	21.9	10.3
Primary	60	62	23.5	30.6
Secondary	117	95	45.8	47
Tertiary Education	22	24	8.6	11.8
Total	457			100
Years of Experience				
≥ 4years	9	19	23	9.4
4 -7 years	36	50	14	24.7
8-11 years	40	24	15.6	11.8
12-15 years	100	68	39	33.6
16-19 years	25	25	9.8	12
20 years & above	31	16	12	7.9
Total	457			100
Annual Income (naira)				
100,000 – 299,000	50	28	19.6	13.8
300,000 – 499,000	68	50	26.6	24.7
500,000 – 699,000	58	40	22.7	19.8
700,000 – 899,000	34	44	13	21.7
≥ 900,000	45	40	17.6	19.8
Total	457			100
Occupation				
Farming	127	123	49.8	60.8
Civil service	10	22	3.9	10.8
Merchandise	80	36	31	17.8
Private paid employment	29	18	11	8.9
Others	09	03	3.5	0.99
Total	457			100
Quantity of Fresh Fruit Bunches				
≥ 80 FFB	80	46	31	22.7
80-150 FFB	89	78	34.9	38.6
151-300 FFB	60	50	23.5	24.7
301 FFB & above	26	28	10	13.8
Total	457			100

Source: (author's computation, 2020)

Table 3: Summary Statistics of Socio-Economic Characteristics of Palm Oil and Palm Kernel Respondents in the Study Areas

Statistics	Age	Household Size ha	Educational Background	Annual Income (N)
Mean	45.8	10	10	534,000
Median	42	9	6	450,000
Mode	39	8	6	400,000
Standard deviation	10.86	4.90	4.84	378,000
Variance	118.04	24.08	23.49	1.43884
Minimum	22	5	0	90,000
Maximum	65	32	15	3,500,000

Source: (author's computation, 2020)

Influence of Socio-economic Characteristics of Respondents on the Technical Efficiency of Palm and Palm Kernel Output in the Study Areas.

Table 4 presented the result of the influence of socioeconomic characteristics of respondents on the technical efficiency of palm oil and palm kernel output in the study areas. The technical efficiency (TE) estimates of the palm oil and palm kernel producers are presented in the Table below. The Table showed the technical efficiency rating of the palm oil and palm kernel producers. It revealed that predicted technical efficiencies differ substantially ranging between 0.226 for the least producer and 0.967 for the best producer with a mean technical efficiency of 0.825. The efficiency difference among these producers is indication of a substantial potential for efficiency improvement in palm oil and palm kernel production in Enugu and Kogi States. The Table further indicated the average technical efficiency of 0.825 (82.5 percent), this indicated that given the level of technology of the palm oil and palm kernel producers, little (17.5%) can be done to increase their technical production capacity. From the results obtained, although producers were generally relatively efficient, they still have room to increase the efficiency in their production activities.

Table 4: Frequency Distribution of Technical Efficiency of Palm oil and palm kernel farmers in Enugu and Kogi States

Technical efficiency (Tf)	Frequency
< 0.40	18.0
0.40-0.49	16.0
0.50-0.59	26.0
0.60-0.69	30.0
0.70-0.79	38.0
0.80-0.89	158.0
0.90-1.00	152.0
Total	438
Mean efficiency	0.825
Minimum efficiency	0.226
Maximum efficiency	0.967

Source: (author's computation, 2010)

Meanwhile, Table 5 below showed the result of the inefficiency model of palm oil and palm kernel producers in Enugu and Kogi States. The result showed that sex and household size were not significant, confirming the low level of technical inefficiency effect in palm oil and palm kernel production in Enugu and Kogi States. The implication is that producers with more years of formal schooling tend to be more efficient in palm oil and kernel production, presumably due to their enhanced ability to acquire technical knowledge, which makes them move close to the frontier output. This finding agreed with Amaza and Maurice (2005) and finding by Coelli and Battase (1996). It is very plausible that the producer with education respond readily to the use of improved technology, thus producing closer to the frontier. The result showed that age of farmers and annual income show negative effect, since the dependent variable of the inefficiency function represented the mode of inefficiency. A negative sign on an estimated parameter implied that the associated variable has a positive effect on efficiency and annual income has a positive influence on the efficiency of palm oil and kernel producer in Enugu and Kogi States. Also, positive coefficient for producers implied that the producers level of technical inefficiency increased. The gamma (γ) ratio of 0.8642 in the study areas indicated that 88.02% of the total variation in the output of palm oil and kernel is due to the technical inefficiencies in study areas. Sigma square is on the other hand 0.3118 and statistical significant at 1% level. Since the figure is significantly different

from zero, it indicated a good fit and correctness of distributional form assumed for the composite error term.

Table 5: Determinants of Technical Inefficiency of Maize and Rice Farmers in Niger State

Variables	Parameters	Coefficient
Constant	δ_0	0.3747** (4.0173)
Age	δ_1	0.626** (2.3094)
Educational status	δ_2	0.1469** (1.9859)
Sex	δ_3	0.4947 (0.8073)
Years of experience	δ_4	-0.2333** (6.011)
Household size	δ_5	-0.8689 (2.3069)
Annual income	δ_6	-0.7566*** (2.6112)
Sigma-square	δ^2	0.3118*** (4.2809)
Gamma (γ)		0.8642*** (2.666)

Source: (author's computation, 2020)

Figures in parentheses are t values

***= Significant at 1% level of probability

**= Significant at 5% level of probability

*= Significant at 10% level of probability

Source: (Authors Computation, 2020)

Conclusion and Recommendations

Agricultural livelihood studies are important especially in Nigeria where more than 70% of the population is involved in agriculture to sustain a living. The aim of this study is to evaluate the effects of the socio economic factors of farmers on palm oil and palm kernel industry. The commodities are among the most dynamic commodities in the country as palm oil contributes to local food system. Palm oil and palm kernel production is a major vocation in many rural communities, as it provides income and employments to the people as well as raw materials to industries. This study is an increased focus on palm oil and palm kernel livelihoods by providing insights on the contributions of palm oil and palm kernel

production as a strategy for coping with unemployment and poverty. The findings of this study suggest that palm oil and palm kernel livelihoods is still a lucrative enterprise that can help in the diversification of the economy as well as sustain the rural farmers who engage in it.

The following recommendations were therefore suggested:

There is need for increased involvement and participation of the people in the palm oil sector to revive the sector and the benefits thereof. This involvement has to cut across government, farmers and all the stakeholders in the industry. Hence;

1. Farmers should be encouraged to expand their scale of production for optimal usage of inputs.
2. Because of the thriving market for palm oil and palm kernel, farmers should be encouraged to establish palm plantations.
3. Farmers should form cooperative societies to help them access loan and other credit facilities from government and commercial banks for expansion.
4. Since majority of the farmers live in the rural areas, government should promote rural development through the provision of physical infrastructures such as good transportation system, low cost and provision of processing, storage and communication facilities to make rural living more conducive and enjoyable.

References

- Adegeye, A.J. & Adegeye, O.S. (2000). Technical and economic information in agriculture. (The oil palm *elaeis guineensis*). *Nigerian Agricultural Development Studies* 1(2), 140-155.
- Adeyemo, A. O. (2015). Analyses of the determinants of palm oil production in Nigeria (1971-2010). *Greener Journal of Agricultural Sciences*, 5 (4) 110-117.
- Ajani, E.N, Onwubuya, E.A., & Nwalieji, H.U. (2012). Assessment of oil palm production and processing among rural women in Enugu north agricultural zone of Enugu state, Nigeria. *International Journal of Agricultural Sciences* 2(12), 322-329.
- Dada, L.A., (2007). The African export industry: What happened and how can it be revived? Case study on the Nigerian Oil Palm Industry. Rome: FAO
- Etoamaihe, U.J. & Ndubueze, K.C. (2010). Development of motorized African breadfruit dehuller. *Journal of Engineering and Applied Sciences* (5), 312-315.

- Gourichon, H. (2013). Analysis of incentives and disincentives for palm oil in Nigeria. Technical notes series, Monitoring African food and agricultural policies. Rome: FAO.
- Ogundele, O.O., & Okoruwa, V.O. (2006). Technical efficiency differentials in rice production technologies in Nigeria. AERC Research Paper154. *African Economic Research Consortium, Nairobi*. <http://www.aercrafica.org/documents/RP154.pdf>. Retrieved 12/08/21.
- Oil World Data base (June, 2016). Global palm oil production 2015-MMT
- Omoti, U. (2011). The Nigerian palm oil industry: past performances and current challenges. Paper presented at the workshop on tapping into opportunities in the palm oil sector of Nigeria's Economy held on October 24-25, 2011 Benin City, Nigeria.
- Nwandu, P.I. (2020). Income distribution among forest dependent rural households in Delta State, Nigeria. *Nigerian Agricultural Journal* 51(2), 287-292 from <http://www.ajol.info/index.php/naj>
- Ukwuteno, S.O. (2017). Economic analysis of small-scale oil palm production in Kogi State, Nigeria. Retrieved on 26/01/21 from <http://www.thisdaylive.com/articles/palm-oilimportation-astrategic-stabiliser-for-palm-oil-industry-nigeria/198476/>.
- United States Department of Agriculture (2018). Crop progress and conditions - census of agriculture. Washington DC: USDA.