ENGINEERING AND TECHNOLOGY IN INDIA

Volume 8 | Issue 1&2 | April & October, 2017 | 74-79
e ISSN-2230-9284 | Visit us : *www.researchjournal.co.in*
DOI : 10.15740/HAS/ETI/8.1&2/74-79

ARTICLE CHRONICLE :
Received : 10.07.17;
Revised : 11.09.17;
Accepted : 25.09.17

RESEARCH ARTICLE

Re-engineering rural farmers for sustainable agricultural food production for diversifying economy in ebonyi state, Nigeria

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ABSTRACT

The gradual decline and short fallen in agricultural food production as demanded by large population in Nigeria and subsequent failure on the price of crude oil prompted this study to diversify the Nigeria economy, through agricultural production by Re-engineering rural farmers. The population of the study was 402 rural farmers in the three agricultural zones in Ebonyi State. 195 rural farmers were randomly selected, as the sample size for the study. The instrument for data collection was Re-engineering rural farmers for sustainable agricultural food production for diversifying, Nigeria economy questionnaire (RRFSAFPDNEQ).The instrument was validated by 3 experts two in agricultural education unit in Department of Technology and Vocational Education,one in measurementand Evaluation in Department of Science Education,in Ebonyi State University, Abakaliki.Crownback alpha, reliability co-efficient was used to test the internal consistency of the Instrument, which yielded 0.86. The instrument was administered to the respondents with the help of 3 research assistant, one in each agricultural zone, mean and standard deviation was used to answer the research questions. Findings of the studyreveals (1) That, ecological factors favours agricultural crop production in the state. (2) That machinaries for agricultural food crop mechanization are not available for farmers to use in farming activities. (3)That farmer's sources for financing, their, farm is mainly on personal saves.Among the recommendation made was that farmers need to be assisted in the areas of irrigation to encourage them in dry season farming.

KEY WORDS : Re-engineer, Rural farmer, Agricultural food production, Diversifying, Economy

How to cite this Article : Ogba, E.I. and Ndem, J.U. (2017). Re-engineering rural farmers for sustainable agricultural food production for diversifying economy in ebonyi state, Nigeria. *Engg. & Tech. in India,* **8** (1&2) : 74-79; **DOI : 10.15740/HAS/ETI/8.1&2/ 74-79.**

INTRODUCTION

Agricultural production in crop and animals has been self-sufficient in food production in Nigeria, since the country has been one of the exporters of food crops to other countries of the world,(1950s, 1960s and 1970s). However, Nigeria has been using cash crop as her major sources of income, as well for her annul budget. The condition changed early 1980s, when exportation, dropped and changed to importation with the geometric increase in the population of Nigerians. This declines and short fallenin agricultural food production started in Nigeria since the discovery of crude oil, as captured by Ogwuru *et al.* (2014). It seem that this over reliance on crude oil (Petrocum), created the gap in the supply of farm input, diseases control on crops, pest attack, poor amenities, infrastructures development to farmers, ignorance, poverty among others in the rural areas. This gap created a lot of problems to the

farmers that could have been consistent in their food production to feed the nation. Then, the question is, who are the farmers? They are the people who live in the villages, committees and local government area, with defined pattern of living year in-yearout participating effectively in the farming activities for production of food. However, the problems of the farmers need to be addressed, to ensure adequate production of food to feed the nation. Therefore, it become necessary to re-engineer the rural farmers, to give them the needed assistant that are required to produce more food to feed the nation. Re-engineering is the way of improving system responsible for production of more food for human consumption, for industrial use, for exporters and foreign exchange earning to increase the GDP, create job opportunities and increase aggregate economic activities in the country. To re-engineeris to examine the ideas, believe think about things carefully, because, the situation is no longer, what it was before in the country and ensure that correct form of food production.To-re-engineeris to correct activities, the system, to improve things,for the person, who has been badly treated, in food supply, exammistake made and proffer solution. To-re-engineer rural farmers in this contest is to examine the rural farmers for sustainable condition, to reduce decline in agricultural food production and proffer solution for more food production, and increase the GDP, export more food, for foreign exchange earning among others, in order not to depend on crude oil only.

This will reduce the decline in food production with the corresponding increase in food importation and geometric increase in population as stipulated in the 2001 estimated population of 162 million in Nigeria as shown in Table A:

Table A: Increase in food importation and geometric increase in population

Food	1996	1997	1998	1999	2000	2001
Short fall	2.91	3.34	3.13	4.22	5.34	6.51
Import	2.95	3.47	3.24	4.48	5.59	6.91

Sources Ogwuru *et al.,* 2014 in Ndomis (2016)

To diversify is to follow different avenue for increasing food production and increase the level of income generation, to remove mono-economy, through crops and livestock production, in the areas of fish farming, poultry farming, forestry,vegetable production, rice and cassava production among others, not depending on crude oil for GDP increase only for instance in 2014 oil and gas accounted about 94 per cent of Nigeria export revenues and 40 per cent of her GDP (P. W. C., 2015).This indicate that there is decline in agricultural production. As at now that oil has faltenglobally. The GDP growth has faltenbelow zero per cent since (Mid, 2016). Therefore, agricultural sectors remain the only promising sector, since, factors of production are favourable,with good ecological factors and hardly fall in the global food prices. The essence of agricultural production is to provide food security, raw material for industries, food export and foreign exchange earning, increase in GDP. Job opportunities and increase aggregate economic activities in a country. But now the land area utilized and yield per hectare has changed in Nigeria because of different agencies responsible for collaborating with the rural farmers has failed IFAS/USSA (2016). Re-engineering, rural farmers sustainable agricultural food production and diversifying economy in the State. Require holistic and integrated approach in mechanization of agricultural system and other factors of production necessary for massive food production.

Ndomi (2016) maintains that rural farmers sustainable agricultural production requires farm mechanization, industrial development, increased, dietary awareness food security in ministries and parastatal. He maintains that, manufacturing sectors, development of labour sector utilization and policy support is a favourable factor of agricultural production for the population growth among others. Mc and Grace (2009) maintains that mechanization of farming practices, throughout the world has evolutional food production system which enable it to maintain pace with population growth. He stress that mechanization is the application of machinery, implements and tools in the production, processes and storage of farm product, covering both flora and fauna. Rijk (2000) maintains that agricultural mechanizations embraces the use of tools, implements and machines for agricultural and development, crop production, harvesting, preparation for storage and on farm processing. It includes the use of animal and mechanical sources of power. The manufacturing, distribution, repair maintenance, management and utilization of tools implements and machines efficient and effective manner. It is imperative that Nigeria need to have outfits (industries) for manufacturing farm tools, equipment, machines and the commercial farm for putting them into use. Ndomi (2016) maintains that agricultural

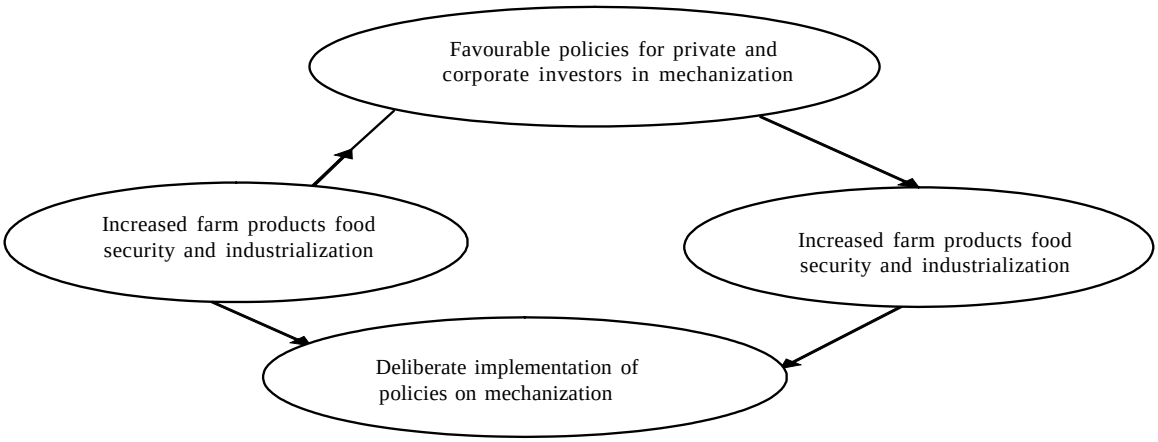

Fig. A : Mechanization model

production for Nigeria can follow this simple cyclical path way as mechanization model (Fig.A).

Joseph *et al.* (2015), Maintains that rural farmers sustainable agricultural production has experienced a lot of challenges and set backsince, there is no agricultural industrialization, that will use the raw materials, produced in agriculture, to stimulate and finance rural farmers to produce more food. They maintain that, what makes a country to develop fast is to attain the status of developing nation, when the industries, finance the sources of raw materialsin production sectors. Produce food to feed her citizenry. They stress that a country with good ecological factors are bound to produce food massively.

USDA/FAS (2016) made it clear that agricultural production are mainly on the hand of rural farmers and need Re-engineering to attract and increase more rural farmers to reduce gradual decline from estimated 78 per cent of population in the 1990 to 70 per cent in 2010s through agricultural mechanization. Osigwe *et al.* (2015) maintained that farmers sustainable agricultural production requires Re-engineering to reduce the major challenges in policy making in agricultural food production and marketing on the low price of farm produce to place ban of importation of some food products, to encourage rural farmers and enable them to develop fast.

Statement of the problem :

Agricultural food isin short supply, compared to its industrial demand, for human consumption, for live stock feed, exportation to other countries of the world,among other areas of food demand. This decline and short fallen in agricultural food crops supply has created a lot of problem to individual, groups in the state, Nigeria and global level. Since, Nigeria has been a major exporter of her cash crops to other countries of the world. But today Nigeria has become a major importer of agricultural food crops. It becomes a serious sense of worries to the researchers to Re-engineer rural farmers for sustainable agricultural food production to increase food production, for consumption, industrial use, exportation among others for diversifying economy in Ebonyi State, Nigeria.

Purpose of the study:

The purpose of the study is to Re-engineer rural farmers for sustainable agricultural food production for diversifying economy in Ebonyi State, Nigeria.

Research objectives :

– Identify ecological factors in crops production for farmers in Ebonyi state?
– Identify machineries for agricultural mechanization in crop production in Ebonyi state.
– Identify source of farm finance to rural farmers for agricultural crop mechanization in Ebonyi state?

Research questions:

The study answers the following research questions.

– What are the ecological factors in crop production for farmers in Ebonyi state?

– What are the machineries for agricultural mechanization in crop production in Ebonyi state?

– What are the sources of farm finance to rural farmers for agricultural crop mechanization in Ebonyi state?

EXPERIMENTAL PROCEDURE

The design of the study is descriptive survey research. The study was guided by three research questions. Area of the study is Ebonyi state of Nigeria. The population for the study is 402 rural farmers. Simple random sampling techniques was used to select the sample size of 195, comprised of 185 farmers (registered and unregistered) and 10 extension agents, by balloting and replacement. The instrument for data collection was titled Re-engineering rural farmer sustainable agricultural food production for diversifying economy questionnaire (RFSAFPDEQ). The instrument was validated by three experts, two in agricultural education unit in the Department of Technology and Vocational Education and one in measurement and Evaluation in the Departmentof Science Education in the same Faculty of Education of Ebonyi State University, Abakaliki forcontent and face validation.The corrections and observations was strickly taken to produce the final instrument. The instrument was trial tested in Enugu East zone, because of their love for farming. Crownback alpha reliability method was used to determine the internal consistency of the instrument. A reliability co-efficient of 0.88 was obtained. The researchers used two research assistance, that was trained for one day on how to administer the instrument, as, on the spot distribution and collection from the respondents. 195 copies of the questionnaire were administered to the respondents and collected. The data collected was analyzed using means and standard deviation to answer the research questions, a bench mark of 2.50 was used to determine the level of acceptance or otherwise, rejection for each item. Item with 2.50 score and aboveis accepted, while below 2.50 is rejected.

EXPERIMENTAL FINDINGS AND ANALYSIS

The result obtained from the study is presented in Table 1-3.

Research question I:

What are the ecological factors in crop production for farmers in Ebonyi state?

In Table 1 all the item statement were accepted by the respondent as appealing as, a favourable ecological factors for massive agricultural food production in the state.

Research question II:

What are the machineries for agricultural mechanization in crop production in Ebonyi state?

In Table 2 all the item statement were rejected, since non of the machineries needed farm mechanization were available for farmers use in farming activities.

Research question III:

What are the sources of farm finance to rural farmers for agricultural crop mechanization in Ebonyi state?

In Table 3, items 7 and 8 was rejected while items 1, 2, 3, 4, 5, 6 and 9 were accepted by the respondent as the only sources for their farm financing in the state.

Table 1 revealed that all the item statement was appealing to the rural farmers and extension agents as the basis ecological factors that favours the agricultural food production in the state. Item 9 has the highest score, it explains the necessary photoperodism in the state, which favours crop germination, growth and photosynthesis for high crop yield. This implies that without normal photoperiodism crops may turn to be vegetative, instead of producing high yield. This study is in line with the study of Joseph *et al.* (2015) who stress that a country with good ecological factors is gifted in production of

food. Since they have what it takes in the environment to produce food crops.

Table 2, reveals that all the item statement was rejected since, machineries for farm mechanization are not available for farmers to mechanize their farming activities. This findingis in line with the study of Ndomi (2016) who view mechanization as the utilization of machines in different sectors of farming activities, such as manufactory sector, human factor development machine training, machines, planters, harvesters among other machines.

Table 3, reveals that only item (7 and 9) were rejected by the respondents out of the 9 item statements in agricultural sub-sidy. Farmers and extension agents maintain that governments do not give item fertilizers free. That

Table 1: Means and standard deviation on ecological factors that favours agricultural crop production in Ebonyi State

Sr. No.	Item statements	$\bar{x}$	SD	Decision
1.	Most of the soil in the state are fertile	3.2	0.61	Accepted
2.	Many swamp soil are rich and fertile for rice production	3.1	0.60	Accepted
3.	Sandy soils in the state are fertile for cassava production	2.71	0.41	Accepted
4.	Cover crops are grown here to protect soil erosion like potato	2.80	0.42	Accepted
5.	Soil structure in the state with stand continues cropping	2.72	0.60	Accepted
6.	Soil texture in the state favor many arable crops like yam, cocoyam among others.	3.2	0.61	Accepted
7.	Most of the cleay soil are fertile and used in rice production	3.1	0.60	Accepted
8.	The temperature in the state favors crop production and vegetative fruits,leaves, stems, roots among others.	3.2	0.62	Accepted
9.	The photoperiodism of in the state favors crop growth and yield in all crops	3.3	0.73	Accepted
10.	The state is not disease Endemic area for crop production	2.81	0.45	Accepted
11.	Pest is not a problem to farmers in crop production in the state	2.13	0.32	Accepted
12.	Weed control in crop production are controlled with herbicides	3.0	0.60	Accepted

Table 2 : Mean response of farmerson farm machineries for crop production

Sr. No.	Item statements	$\bar{x}$	SD	Decision
1.	Tractor for hiring at state level for farmers are available	2.20	0.31	Rejected
2.	Tractor for hiring at local government level are available	2.21	0.32	Rejected
3.	The farmers co-operative tractors are for hiring to individual farmers	2.21	0.32	Rejected
4.	Had driving tractors for poddling are read for rice farmers to hope	2.00	0.25	Rejected
5.	Tractor for drilling rice seed in the field are ready for hiring to farmers	2.21	0.22	Rejected
6.	Tractors for transplanting seedling of rice are read for hiring to farmers	1.20	0.20	Rejected
7.	Tractors for ploughing and harrowing are read for hiring to farmers	2.50	0.41	Rejected
8.	Tractors for harvesting crops are read for hiring to farmers	2.21	0.23	Rejected
9.	Tractors for threshing rice and winnowing are read for farmers to hire	2.21	0.25	Rejected
10.	Machines for processing rice, cassava among other are read for farmers to hire.	2.2	0.79	Rejected

Table 3: Mean response of rural farmers on source of farmer finance,item statement

Sr. No.	Item statements	$\bar{x}$	SD	Decision
1.	Rural farmers sources of finance is by self-saving	3.21	0.72	Accepted
2.	Monthly contribution of farmers to each person (Izuzu)	3.22	0.81	Accepted
3.	Sales of rural farmers last year agricultural products stored	3.23	0.75	Accepted
4.	Sales of livestock for financing farm work, like/goats, caws, sheep for crop farming	3.23	0.78	Accepted
5.	Borrowing money from commercial bank for farming (Loan)	2.71	0.54	Accepted
6.	Borrowing money from micro finance bank for farming (Loan).	3.52	20.51	Accepted
7.	Issuance of farm sub-8idy to farmers like (fertilizer. Herbicides) by government	2.21	0.42	Rejected
8.	Issuance of improved seeds and seedling to farmers by government (only targeted farmers).	2.50	0.53	Rejected
9.	Payment of counter part fund IFAD by government for farmers to benefit from getting money for farming from IFAD.	2.22	0.23	Not accepted

government do not pay farmers counterpart in international fund for agricultural development fund-(IFAD).This findings is in line with the study of Ogwuru *et al.* (2014) who stress that government do not give attention in the factors of food production, such, as agricultural sub-sidy to farmers, (supply of farm input) disease control, poor amenities among other factors, that led to the decline in food supply.

– That, ecological factors favours agricultural crop production in the state.

– That machineries for agricultural crop food mechanization are not available for farmers to use in farming activities.

– That farmers source for financing their farm are mainly on personal saves.

Conclusion :

Farmers are the engineers in food production to feed the nation, provide security in food. But now have fallenshort of their basic function. Then, it become necessaries to Re-engineer farmers for sustainable agricultural production to close the gap that led to short fallen in food production. Provide what ever that are needed asfactors for massive food production in the state, Nigeria and global level.

Recommendations:

Based on the findings of the study the following recommendation were made.

– That farmers need to be assisted in the areas of irrigation to encourage them in dry season farming.

– That machineries need to be made available to farmers starting from choice of land (Ploughing and Harrowing) rigging, planting, weeding harvesting among other machines.

– That farmers needs to be assisted by government in supply of farm input in terms of agricultural sub-sidy (Herbicides fertilizes, loan without interest, among others toencourage farmers for massive food production food in the state.

Acknowledgement:

The researchers wish to acknowledge Prof. C. Ikeoji for his time spent in going through the work. Also the researchers are indebted to the typist, by name Jacinta O. for taking type to type set the work.

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