

## A Descriptive Study of Peculiar Challenges to Optimum Health and Productivity in an Agrarian Community in Ondo State, Southwest Nigeria: A Pilot Study

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### **Abstract**

**Aims:** We set out to study the common health complaints of rural farmers and identify those factors that militate against achieving good health and productivity among them.

**Methods and results:** A descriptive cross-sectional study. Consecutive subjects with complaints were physically examined for specific diagnosis. Audio interviews of selected individuals and video evidences of agricultural practice and infrastructure were obtained. A total of 155 subjects were attended to at the free community screening

exercise. Seventy four (47.7%) had medical complaints.

Musculoskeletal disorder (56.8%), hypertension (28.6%) and hernia (5.4%) were the most common diagnosis. There was significant association between farming and presence of musculoskeletal pain ( $p=0.001$ ). There was palpable lack of basic amenities for healthful living such as a health centre, public school, potable water source and power supply. Majority of subjects practiced manual labour; there was no modern day farming equipment that aid farming activities. Interviewees admit that farming practice was stressful and consequently limited their productivity.

**Conclusion:** *Health concerns across specialties are prevalent among farmers in the rural setting against a backdrop inadequate health facilities and personnel to cater to their health. Policies and action steps that promote the health of rural farmers for improved productivity are required of the government.*

**1. Key words:** health challenges, rural farmers, productivity, health policy, Nigeria

## 2. Introduction

3. The current drive by the Federal Government of Nigeria to broaden the revenue generation base of the nation by revamping the agricultural sector following the recent shortfall in the revenue from crude oil is both timely and laudable. This is because agricultural production still ranks second only to crude oil in terms of contribution to the national Gross Domestic Product (GDP) despite its perceived neglect by generations of Nigerian policy makers.<sup>1-2</sup>

4. However, the lacuna created by decades of dependence on crude oil and neglect of the rural areas has given room for the emergence of a generation of 'urbanized' Nigerians who have become accustomed to the Western lifestyle which is by and large information and

technology (I & T) driven.<sup>3</sup> Such people (who are already used to easier ways of living and getting things done) are not likely to find the rural setting with its strenuous farming methods attractive; neither would living conditions which are considered 'stone age' and somewhat retrogressive be imaginable to them. It is therefore important to ensure that efforts are put in place to provide basic amenities for meaningful and healthful daily living in the rural areas in order to attract the younger generation into crop farming.<sup>4</sup>

5. Aside provision of basic amenities and infrastructure which include good road network, electricity, pipe-borne water, communication network, hospitals, schools and motorized-farming system, it is pertinent to ensure that the health of farmers (who are the primary drivers of the agro-economic sector) is in optimum condition. A good health status has been associated with improved strength and endurance of farmers as well as their mental capacities and reasoning abilities thus impacting positively on their productivity.<sup>5</sup>

6. The health problems of the rural farmers are myriad. The World Health Organization (WHO) has listed problems of inadequately planned

housing, poor water supply and unhealthy sources, sewage and solid waste disposal, educational facilities, transportation and communication systems and lack of appropriate and protective farm clothing as problems bedeviling the health of farmers in the rural areas aside occupational hazards.<sup>6</sup> Water-borne and vector-borne diseases are epidemiologically more prevalent among rural dwellers. Previous studies have identified a number of preventable diseases such as malaria fever, HIV/AIDS, farm injuries, cholera fever, schistosomiasis, diarrhoea, respiratory diseases and skin disorders.<sup>7-9</sup> Also, strenuous non-mechanized farming is associated with poorer health among farmers ultimately leading to poor production and reduced Gross Domestic Product.<sup>10</sup>

7. This research was conducted to study the common health complaints of the rural dwellers that usually are predominantly farmers, and identify other factors that militate against achieving good health and productivity among them.

## 8. MATERIAL AND METHODS

9. **Study location:** The study was conducted in *Adejori* village in Ondo West Local Government Area of Ondo State, Southwest Nigeria. It is a farming

settlement with an estimated population of 3,500 people. Its only link to the nearest City is a 4,500km road which is mostly un-tarred. The main crops that are produced are cocoa, palm oil, cassava and *kolanut*. It has no electricity or potable water supply, no public school. Its dedicated health centre is under construction. It is served by a Primary Healthcare Centre (manned by a Community Health Extension Worker) located in the neighbouring village, *Ilugha* which is about 3km away. Other surrounding settlements include *Ogunlepa*, *Olorunredo*, *Bature*, *Kajola*, *Lege* and *Lipetesi*. Historically, *Adejori* farming settlement is over a century years old.

10. **Study design:** A descriptive, cross-sectional study conducted during a community screening exercise in November 2017.

11. **Inclusion criteria:** All consecutive subjects aged  $\geq 17$  years were recruited.

12. **Exclusion criteria:** Individuals less than 17 years of age were excluded.

13. **Procedure:** At least 3 sensitization visits were made to the community head before the exercise and public announcement was made by the local town crier. All consecutive adults aged  $\geq 17$  years were studied. Their consent

was obtained after explaining our objectives and methods to them in their local dialect. Their bio-data, general medical complaint (if any), and physical examination findings (where necessary) were obtained. Blood pressure (BP) was measured with the mercury sphygmomanometer (*Accosons, Germany*) on the right arm after about 5 minutes of rest with subjects in the sitting position. Hypertension was classified according to the seventh Joint National Committee Report on Detection, Evaluation and treatment of High Blood pressure (JNC 7) report<sup>11</sup>. Subjects found to have high BP were asked to rest for at least one hour and the measurement was repeated before the exercise was concluded. Subjects with suspected surgical complaints were physically examined in a designated cubicle and those with surgically amenable diseases were referred to competent healthcare facilities in Ondo City. Historical perspectives and general information on the village, presence and distribution of basic amenities and their aspirations were obtained by one-on-one direct interview of randomly selected individuals on audio tape and transliterated. The interview was conducted by the clinician in attendance

at the screening exercise. Pictures and video evidences of our study were obtained during a tour of the community.

<sup>14</sup>. **Ethical approval:** Ethical approval was received from the Ethics Research Committee of the State Specialist Hospital, Ondo State, Nigeria.

15. **Statistical Analysis:** Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 20.0 by IBM. Results were presented in tabular form. Discrete variables were presented as frequency and percentages. Continuous variables were presented as means and standard deviation. Chi-square was used to determine association between categorical variables. P value < 0.05 was taken as significant. Independent Sample T Test was used to determine differences in mean at 95% Confidence Interval.

## 16. RESULTS

17. A total of 155 subjects were attended to at the free community screening exercise. Seventy four of them who had complaints and presented to the physician were recruited for the study. There were 31 (41.9%) males and 43 (58.1%) females. Age range was 17-73 years. Mean age was 40.94±17.33 years, mean SBP 120.57±28.69mmHg, mean

DBP  $73.43 \pm 16.58$  mmHg. Table 1 shows that 69.3% of the subjects were farmers. The mean ages for farmers and non-farmers were  $46.27 \pm 16.28$  and  $28.36 \pm 12.79$  years respectively.

18. There was a wide variety of medical illnesses found among the subjects as shown in table 2. The most prevalent ones include musculoskeletal pain (56.8%), systemic hypertension (26.8%) and inguino-scrotal hernia (5.4%). Table 3 showed the differences in clinical parameters among farmers and non-farmers using the Independent sample T-test. There was a significant difference in the gender distribution among farmers and non-farmers ( $p = 0.026$ ), age range ( $p = 0.001$ ) and presence of musculoskeletal pain ( $p = 0.001$ ) as indicated in table 4. Table 5 showed that musculoskeletal pain was most prevalent in the lower back (61.9%), chest (7.1%), knee (7.1%) and legs (7.1%).
19. A transcript of the audio recording of one-on-one interviews of selected individuals was made. To the question, “why did you come to Adejori village?” one respondent replied, “the quest for means of livelihood brought me to Adejori; I came to make money just like

many others”. To the question, “how do you access health in Adejori village?” the reply was, “Community Health Extension Workers are sent to the village from time to time but they have no health post to work. The *Baale* (village head) usually accommodate them in his compound. We only go there for minor treatment at a price as we take serious cases outside the community to Ondo city”

20. To the question, “how stressful is farming practice in *Adejori* village? Another respondent replied, “farm-work is stressful as we walk long distances to the farm; for me it takes about one hour before reaching my site. I often experience body ache, fever and chest pain due to the day’s work and from carrying heavy load on my head from the farm to the house daily”
21. To the enquiry on availability of basic infrastructure, the response was, “government has not provided schools for primary or secondary education, tap water and good roads. The road leading to the nearest village, *Ilugha* where we access healthcare at the Primary Health Care Centre was constructed by our joint effort with the villagers in *ilugha*. The government has only just started the

construction of a health centre in Adejori village a couple of weeks ago”

22. One female respondent said, “Farming is difficult for women as it affects our family life; for me, it is difficult to monitor the academic progress of my children. This is because I am often too tired after returning from farm. We as women are forced into farming since we don’t have enough money to start our preferred trading business; we can hire farm hands if there is money; the stress is much as I don’t sleep well due to excessive internal heat derived from prolonged stay under the sun. Sometimes, even after pouring water on my body, sleep eludes me. Right now, I am finding it difficult to pay my children’s school fees”.

**Table 1: Socio-demographic and clinical characteristics of subjects in Adejori village**

23. Parameter	Frequency	Percentage
<b>Gender</b>		
Male	31	41.9%
Female	43	58.1%
<b>Age range</b>		
Young (<45 years)	43	58.1%
Middle age (45-64 years)	23	31.1%
Elderly (>65 years)	8	10.8%
<b>Occupation</b>		
Bricklayer	2	2.7%
Business persons	2	2.7%
Clergy	1	1.4%
Farmer	52	70.2%
Hairdresser	5	6.7%
Student	4	5.4%
Tailor	2	2.7%
Teacher	2	2.7%
Trader	3	4.1%
Vulcanizer	1	1.4%
<b>JNC 7<sup>+</sup> hypertension stage</b>		

Normal	34	48.6%
Pre-hypertension	16	22.9%
Stage 1	14	20.0%
Stage 2	6	8.6%

JNC; Joint National Committee on Hypertension

**Table 2: Provisional Clinical diagnosis among subjects with medical complaints**

Sub-specialty	Provisional diagnosis	Frequency	Percentage	
Medicine	Peptic ulcer disease	2	2.7%	
	Systemic hypertension	7	28.6%	
	Groin candida	1	1.4%	
	Paraesthesia	3	4.1%	
	Diarrhoea	1	1.4%	
	Diabetes mellitus	1	1.4%	
Surgery	Musculoskeletal Pain	42	56.8%	
	Inguino-scrotal Hernia	4	5.4%	
	Haemorrhoid	2	2.7%	
	Ear ache	1	1.4%	
	Recurrent dislocation of left elbow	1	1.4%	
	Arthritis	1	1.4%	
	Lipoma	1	1.4%	
	Symptomatic prostatic enlargement	1	1.4%	
	Obstetrics and Gynaecology	Pelvic Inflammatory Disease	2	2.7%
		Pregnancy	3	4.1%
Still birth		1	1.4%	
Dentistry	Infertility	1	1.4%	
	Chronic fistulous tooth decay	1	1.4%	
Psychiatry	Anxiety/insomnia	1	1.4%	
	Non-specific symptoms/fever	9	12.2%	

**Table 3: Differences in clinical parameters among farmers and non-farmers using the Independent sample T-test**

Parameter	Farmers	Non-farmers	Sig (two tailed) at 95% CI
Mean Age±SD* (years)	46.27±16.28	28.36±12.79	0.00
Mean SBP (mmHg)	125±28.59	109.50±26.45	0.04
Mean DBP (mmHg)	76.4±16.5	66.0±14.65	0.017

\*SD; Standard deviation

**Table 4: Association between occupation type and clinical parameters in Adejori village**

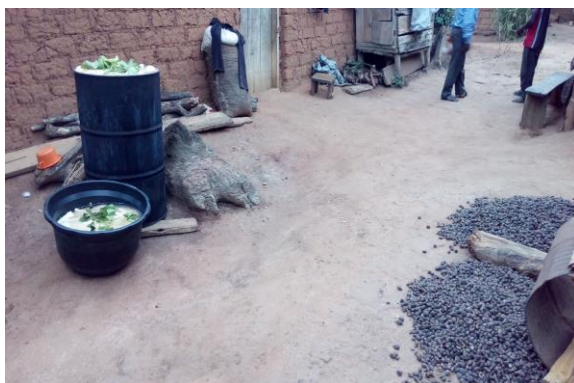
Parameters	Farmers	Non-farmers	P value
<b>Gender</b>			
Male	26 (83.9%)	5 (16.1%)	0.026

Female	26 (60.5%)	17 (39.5%)	
<b>Age range</b>			
Young (<45 years)	24 (55.8%)	19 (44.2%)	0.001*
Middle age (45-64 years)	20 (87.0%)	3 (13.0%)	
Elderly (>65 years)	8 (100%)	0	
<b>Blood pressure</b>			
<140/90mmHg	33 (66.0%)	17 (34.0%)	0.095*
≥140/90mmHg	17 (85.0%)	3 (15.0%)	
<b>Musculoskeletal pain</b>			
Present	34 (87.2%)	5 (12.8%)	0.001
Absent	18 (51.4%)	17 (48.6%)	

Significance determined by Likelihood ratio\*

**Table 5: Site of musculoskeletal pain among subjects**

Site of musculoskeletal pain	Musculoskeletal Frequency	Percentage
Arm	2	4.8%
Chest	3	7.1%
Lower back	26	61.9%
Knee	3	7.1%
Elbow	1	2.4%
Neck	1	2.4%
Leg	3	7.1%
Shoulder	1	2.4%
General body	2	4.8%
Total	42	100.0%



**Figure 1: Cassava and palm kernels under local processing; there was no automated processing machine in the community**



**Figure 2: A subject with right inguinoscrotal hernia. There was history of lifting heavy loads in relation to non-mechanized farming practice**



**Figure 3: A farmer in Adejori village spreading his cocoa beans for sun drying: in industrialized settings, this process could be done using physically less-demanding and faster automated methods.**



Figure 4: Another portion of the same long stretch of road. *Okada* (motor cycle) is the most common means of transportation in *Adejori* village due to the un-passable roads

## Discussion

The subject population was rather small but this could be excused as this exercise was conducted on a Saturday morning in a busy farm settlement where traditionally, the dwellers go early to the farm. At the same time, we observed that majority of them travel to the nearby urban city on weekends to visit their families.

There were more females in this study as expected due to better health seeking behaviour among them. This means that our finding may not be a true representation of the gender differences in the rural setting. The population of elders in the study was relatively lower than the younger age groups. This is not surprising when viewed

critically against the backdrop of *Adejori* settlement being an atypical village where many of its residents come primarily to source for living wages and not exactly to “settle down”. This same reason is probably responsible for the low turn-out of participants at the exercise.

Fifty percent of the subjects presented to the doctor’s desk with clinical complaints. The diseases reported among our subjects cut across all medical subspecialty therefore suggesting the need for the provision of a

well-equipped and adequately staffed medical centre in the community. The highest occurring types of illnesses were surgical and medical in nature with musculoskeletal pain (MSP) and hypertension as the most prevalent. This is in agreement with the report of a review of disease prevalence and mortality among over 1.2 million agricultural workers in Korea between 2004 and 2008 which showed that the most prevalent diseases were arthritis, hypertension, and intervertebral disc disorders. <sup>[12]</sup>

The most prevalent surgery related disease among the subjects was MSP. This observation has been well-documented by various authors. <sup>[13-17]</sup> Farmers are predisposed to MSP because of the physical nature of their work and posture-distortion.



Hypertension was the most common medical illness. Nearly one-third (28.6%) of the subjects had readings of blood pressure in the hypertensive range. This is comparable to findings in similar parts of South West Nigeria where Akinbodewa et al and Oluyomo et al reported a prevalence of 28% and 30% respectively among rural dwellers in Ondo and Osun States. However, a prevalence of 40.2% was reported among rural community dwellers in Plateau State, North Central Nigeria. [18-20] Our study showed that the mean blood pressure was significantly higher among farmers when compared to non-farmers. This may be a reflection of the degree of work related stress (physical, psychosocial and emotional) on the farmers.

In our study, hernia ranked third on the list of complaints by our subjects with a prevalence of 5.4% and was found only among the men. Hernia has been linked to physical exertion and weight lifting which is common among rural farmers. [21] In a study among 61 rural Nepalese who had hernias, 37.7% were farmers. [22] We observed that all the patients complained of insufficient fund for the repair of the hernia suggesting the poverty level among our subjects. This is an indirect indication of the economic impact of a poor and inhibiting environment for their farm practice.

We found a low incidence of PUD related complaints (2.7%) among our subjects. This is surprising because the use of over the counters analgesics and NSAIDs is prevalent among rural dwellers as a result of excessive use of NSAIDs. [13] The prevalence of 2.7% is far lower than 27.4% prevalence of digestive signs and symptoms reported among rural workers. [23] This may be explained by the low number of subjects.

Our study indicates that a wide variety of clinical illnesses (work-related and otherwise) is common among farmers in the rural setting. This pre-supposes that for farmers to focus on their vocation and so produce more farm produce, their health status needs to be given its due attention and action by relevant government agencies and policy makers. Studies have shown that in agricultural communities, poor health reduces income, technical efficiency and productivity which further decrease people's ability to address health problems thus inhibiting economic development. [10,24-25] Egbetokun et al showed that one percent improvement in the health condition of the farmers will increase efficiency by 21 percent. [26] Unfortunately, most healthcare facilities are situated in the cities while the few one in the rural areas are grossly inefficient. [15] Likewise the deplorable

condition of the roads, long distances travelled by farmers and high costs of transportation to health facilities are among recognized factors that militate against access to primary healthcare by farmers in Nigeria. [27]

Our study showed that lack of basic infrastructure for meaningful and healthful living in the community. There was no motorable road, motorcycle was the major means of transportation, the houses were built with bricks but no protection from mosquitoes, source of water was the river or stream, processing of farm produce was local. This is a significant finding when placed side by side with the fact that Africa has the youngest population in the world 200 million people aged between 15 and 24. However, many youth in developing and transition countries have negative perceptions of farming as they see it as being antiquated and unprofitable as things presently stand. [28]

In conclusion, health concerns are prevalent among farmers in the rural setting against a backdrop of lack of adequate health facilities and personnel to cater to their health. The factors that contribute to poor physical health and reduced agricultural productivity and GDP are noticeable. Our study showed gross lack of basic

infrastructure for meaningful and healthful living in the community.

We hereby recommend that a substantial portion of the budget for agricultural production at the Federal and State government levels be tailored towards provision of infrastructure and equipment that reduce the physical burden of farming. There should be collaboration between Ministries, Departments and Agencies that work in the areas of road and transportation, health and agriculture to develop a national road-map for modernization of farming processes in Nigeria within a stipulated period; this should include the application of technology to farming, provision of passable roads, electricity, water and other basic amenities.

Indeed large steps need to be taken towards bridging the noticeable developmental gulf between urban and rural settings. This will provide the younger and fitter generation of Nigerians with the impetus to foray into agriculture without feeling 'less endowed' to their counterparts in the city.

In order to fast track rural development, private companies (local and foreign) should be offered incentives to build roads, health facilities and practice agriculture on a platform of concrete and mutually beneficial memorandum of understanding. The community head, local chiefs and other

stakeholders should be carried along in order to secure the gains from such a relationship and nurture its sustenance. Rural farmers should be offered incentives by the Local Government Authorities to engage in community self-help projects; for instance, government should provide a system of reimbursement for any person or group who takes initiatives for development. The local government system of government should either be strengthened or revamped as the case may be while funding for farming development should be channeled properly through the various tiers of government to avoid misappropriation.

Limitations: This is a pilot study with small sample size. There is a need for further studies with larger sample size for a more reliable set of results.

## References

1. Bakare AS (2013). An econometric analysis of sustainable agriculture and rural development in Nigeria: A Vector Autoregressive Approach (VAR). *Journal of Agricultural Economics and Development*, 2(5): 184-193.
2. Enoma A (2010). Agricultural Credit and Economic Growth in Nigeria: An Empirical Analysis. *Business and Economics Journal*, 14: 1-7.
3. Oladunjoye IM, Audu JS (2014). The Impact of Information and Communication Technology on Youth and its Vocational Opportunities in Nigeria *Journal of Good Governance and Sustainable Development in Africa*, 2(1):106-112.
4. Aphunu A, Akpobasa BIO (2010). Assessment of Rural Youths' Attitude towards Agricultural Production In Sapele Local Government Area Of Delta State. *The Nigerian Academic Forum*, 19(1): 1-4
5. Food and Agricultural Organization/World Health Organization. International Conference on Nutrition and Development. A Global Assessment. 1992; 3-46.
6. World Health Organization. Occupational health: a manual for primary health care workers. 2001;146-151. Available at: [http://www.who.int/occupational\\_health/publications/emhealthcarework/en/index.html](http://www.who.int/occupational_health/publications/emhealthcarework/en/index.html).
7. Clifford M et al (2006). Understanding the links between Agriculture and Malaria. *Water Associated Diseases*, Brief 6 of 16.

- International Food Policy Research Institute (IFPRI), Washington, D. C.
8. Donald C (2006). Understanding the links between agriculture and health food, agriculture and the environment. International food policy research institute, 13, Brief 8 of 16. Available at [www.ifpri.org](http://www.ifpri.org).
  9. Bradley KR (2002). Health hazards in agriculture: An Emerging Issue. A publication of NASD, Department of Agriculture, United States.
  10. Hawks C, Ruel MT (2006). Understanding the links between Agriculture and Health. A paper published by 2020 vision for good agriculture and environment. International food policy Research Institute, Focus 13 brief 1 of 16. <http://www.ci.refer.org/psa/d4.ht.htm> <http://www.kwenu.com>.
  11. Chobanian AV et al (2003). The seventh report of the Joint National Committee on prevention, detection, evaluation, and treatment of high blood pressure: The JNC 7 report. JAMA, 289:2560-72.
  12. Lee WJ et al (2010). Disease Prevalence and Mortality among Agricultural Workers in Korea. J Korean Med Sci, 25: 112-118.
  13. Akinbodewa AA et al (2017). Relationship between musculoskeletal pain and analgesics consumption in a rural agrarian community in South-west Nigeria: implications for renal function and health policy formulation. World Journal of Pharmaceutical and Medical Research, 3(6): 37-44.
  14. Omran A et al (2015). Prevalence of Musculoskeletal Disorders Among Farmers in Eastern Azerbaijan, Iran. Indian Journal of Science and Technology, 8(28): 1-6.
  15. Ajilowo J, Olujimi B (2007). Accessibility of the Rural Dwellers to Healthcare Facilities in Nigeria: The Owo experience. Pakistan J. Social Sci, 4(1): 44-55.
  16. Xiao H et al (2013). Agricultural work and chronic musculoskeletal pain among Latino farm workers: the MICASA Study. Am J Ind Med, 56(2): 216–225.
  17. Holmberg S et al (2002). Musculoskeletal symptoms among farmers and non-farmers: a population-based study. International Journal of Occupational and Environmental Health, 8(4): 339-345.

18. Akinbodewa AA et al (2016). A study of some peculiar tropical risk factors for proteinuria as marker of chronic kidney disease in a rural community in Ondo State, Southwest Nigeria. *Jos Journal of Medicine*, 10(2): 1-8.
19. Oluyombo R et al (2013). A community study of the prevalence, risk factors and pattern of chronic kidney disease in Osun State, South West Nigeria. *West Afr J Med*, 32(2):85-92.
20. Tagurum YO et al (2015). Non-communicable diseases: Prevalence and risk factors among adults in a rural community in Plateau State, Nigeria. *International Journal of Biomedical Research*, 6(4): 228-234.
21. Flich J et al (1992). Inguinal hernia and certain risk factors. *Eur J Epidemiol*, 8: 277-282.
22. Rao SS et al (2016). Clinicoepidemiologic profile of inguinal hernia in rural medical college in central India. *J Mahatma Gandhi Inst Med Sci*, 21(2): 116-121.
23. Cezar-Vaz MR et al (2015). Prevalence of digestive signs and symptoms and associated factors among rural workers. *Acta Paul Enferm*, 28(5):460-6.
24. Croppenstedt A, Muller C (2000). The Impact of Farmers' Health and Nutritional Status on Their Productivity and Efficiency: Evidence from Ethiopia. *Economic Development and Cultural Change*, 48: 475-502.
25. Simon M, Shallone CK (2013). The Impact of Farmers' Health and Nutritional Status on Agricultural Technical Efficiency: Evidence from Masvingo Rural Communities. *Journal of Agriculture and Sustainability*, 3(1): 1-15.
26. Egbetokum OA et al (2012). Farmers' Health and Technical Efficiency in Osun State, Nigeria. *International Journal of Food and Nutrition Science*, 1(1): 13-30.
27. Ama II et al (2015). Constraints faced by Farmers in receiving Primary Healthcare Service in the North-Eastern Zone of Benue State, Nigeria. *Journal of Agricultural Economics, Environment and Social Sciences*, 1(1): 151-154.
28. Why are rural youth leaving farming? IFAD 2016 Youth



Agribusiness, Leadership, and  
Entrepreneurship Summit on  
Innovation (YALESI 2016).  
Accessed December 2017. Available  
at <https://goo.gl/ScnU28>.