



[www.ajbrui.org](http://www.ajbrui.org)

*Afr. J. Biomed. Res. Vol. 21 (September, 2018); 245- 249*

*Research Article*

## **Implementing One Health Concept in Rural Communities: Approaches and Challenges in Sierra Leone**

**Suluku R, Jalloh A.T and Emikpe B.O**

<sup>1</sup>*Animal Science Serology and Molecular Diagnostic Laboratory, Njala University, Sierra Leone*

<sup>2</sup>*Ministry of Agriculture Forestry and Food Security, Sierra Leone*

<sup>3</sup>*Department of Veterinary Pathology, University of Ibadan, Nigeria*

---

### **ABSTRACT**

One health issues need to be accepted and well implemented in rural setting of developing nations where health care delivery is still a mirage. This paper examines the challenges and approaches of implementing one health concept at rural communities in Sierra Leone. Rapid and participatory rural appraisal was adopted to obtain information from invitees, Non-Governmental organizations operating in the communities, direct and indirect beneficiaries in and around the project area which include officials from District council, councilors, ward representatives, Paramount Chiefs, community leaders, health workers, International and National Non- Governmental Organization, Traders, Animal Owners and officials from Ministry of Health and Agriculture. This study showed that implementing One Health in rural communities of this nature had been difficult due to a myriad of factors ranging from lack of trained available personnel, poor infrastructure, a weak health system in the animal and human sector, lack of organized institution and mismanagement of funds. It also identified one health needs and zoonotic diseases of interest as an entry point for implementation of one health concept. One of the zoonoses identified is rabies while dog ownership pattern and management were identified as factors that need improvement to achieve rabies control at rural setting.

**Keywords:** *One Health, Rural Communities, Rabies, Dogs*

\*Author for correspondence: *E-mail: [nyasulukuroland2710@gmail.com](mailto:nyasulukuroland2710@gmail.com)*

*Received: March 2018; Accepted: August, 2018*

### **Abstracted by:**

*Bioline International, African Journals online (AJOL), Index Copernicus, African Index Medicus (WHO), Excerpta medica (EMBASE), CAB Abstracts, SCOPUS, Global Health Abstracts, Asian Science Index, Index Veterinarius*

---

### **INTRODUCTION**

Implementing One Health in most developed nations of the world has been an easy one because all the twelve pillars of the global health security agenda are in place however in developing countries and poor resource settings, the limiting factors identified include lack of trained medical professionals. Rural communities throughout the world including Sierra Leone lack health services for both animals and humans. The Ebola outbreak in upper West Africa (Guinea, Liberia and Sierra Leone) had also contributed to chronically understaffed, demotivated, ill-equipped and overworked health workforce in a poor infrastructure supported by inadequate logistics and resources (Wurie and Witter, 2014). The road networks linking most rural communities are in bad shape, whilst others are inaccessible to vehicles and motorbikes. Poor infrastructural development and lack of adequate personnel in both the animal and the human sectors have contributed to weak health systems in

rural communities in Sierra Leone. The World Health Organization (2014) also identified other weakness including 'absent or weak rapid response systems, few laboratories mainly located in cities, unreliable supply and procurement systems for personal protective equipment and other supplies, lack of electricity and running water in some health facilities and few ambulances. With all these obvious deficits, there is little or no zoonotic surveillance systems and information sharing between human and animal health specialists especially with a diminished veterinary or animal health workforce in place (JEE Report, 2016).

Another very obvious issue is that unequal access to health services which according to reports (Transparency international, 2013) confirm that 48% of Sierra Leonean patient who access health services pay a bribe. This obvious lack of governance structure to reduce this may be one of the numerous reasons affecting one health implementation. JEE, (2016) mission report stated that Sierra Leone has no One Health policy and efforts should be geared towards

strengthening existing surveillance systems for prioritized zoonosis.

There is limited research on animal health and diseases in the country. Based on this premise, this research was conducted to identify possible ways of implementing successful one health concept in rural communities which include identification of priority zoonotic diseases towards community implementation of One Health in rural communities in Sierra Leone.

## **MATERIALS AND METHODS**

**Area description:** The project is located in Koinadugu district, which is the largest district in terms of geographical area in Sierra Leone. It is one of the least densely populated districts in the country. The district is located approximately on latitude 9° N and longitude 11.5° W at an altitude of 423m above sea level. It receives on average 147 days of rainfall from May to October with an average of 208cm per year (UNOCHA, 2015). The natural vegetation of this region is similar to the northern margin of the western Guinea Lowland Forest Ecoregion with closed forest and montane Guinea savannah (UNCCD,2004) . The Koinadugu district has a total land area of 12,121Km<sup>2</sup> with a population of 404,097 and a density of 33/km<sup>2</sup> (Projected 2015 National Population Census). The projected 2014 district population specified that 16% are below 5years,while 30% are between the ages of 5-14 years and the active working population is 49% lies between 15-64 years. There are more women than men 52.5% and 47.5% respectively. It shares borders on the west with Bombali district, south-west Tonkoli District, Kono district in the South, North and Northeast by the Republic of Guinea. The district is divided into eleven administrative chiefdoms, namely Neini, Neya, Diang, Kasunko, Mongo, Wara Wara Bafodia, Wara Wara Yagala, Senqbe, Sulima, Folosaba Dembelia and Dembelia Sinkunia. The chiefdoms are headed by Paramount chiefs who are the traditional rulers. There are 440 schools based on Ministry of Education Science and Technology (MEST, 2013) of which 20 are Pre-primary, 372 primary,40 Junior secondary and 8 senior schools and 71 Health Facilities (SSL,2014), The district is ethnically diversified with Fula, Kuranko, Mandingo, Limba and Yalunka being the dominant tribes in the district. Majority of the people are Muslim 96% and 84% are engaged in agriculture, growing coffee, cocoa, rice and vegetables, whilst a few rear animals such as cattle, sheep and goat.

### **Vegetation, human and animal interaction in study area:**

The pilot district share borders with the Republic of Guinea and there is a high level of cross border movement and interaction between domestic Animals, wildlife and human population. As a result, majority of people living in this district are engaged in cattle, sheep and goat rearing as a major source of income. The Loma Mountain National Part which is 33,201 hectares is located in this district and closer to the project communities. The recent livestock survey placed Koinadugu district as having the second highest number of cattle, sheep and goat in the country (Sierra Leone Livestock Survey, 2017). The faeces of these animals are used by the community

to grow vegetable, which makes them the leading vegetable growers in the country. Cattle traders from Mali and the Republic of Guinea bring their animals to the weekly international periodic cattle market in Gbindi which is also located in the pilot communities. Ministry of Agriculture Forestry and Food Security have the livestock station located at Musaia one of the pilot chiefdoms. Majority of these cattle owners keep dogs in their local ranches known as worreh. These dogs look after these animals during feeding as well as in their worreh at night. Rabid dogs often appear in the villages biting people and killing their animals.

The community lack trained veterinary doctors, livestock officers and effective disease monitoring and surveillance system. There are no effective animal quarantine systems in place at the numerous border crossing points. Animal rearers in the country visit these markets to buy breeding stock as well as animals for consumption.

**Study design:** Rapid Rural Appraisal and focus group discussion tools were used to identify communities and obtain information. Other tools used include interviews of youth, animal owners while Radio, drama, songs and vaccination of dogs was used to attract the communities.

The research was conducted in five villages in Dembelia Sinkunia and Folosaba dembelia chiefdoms. Koromasilaia and Musaia villages are in Folosaba Dembelia chiefdom, while Manah, Masendeh and Sinkunia are in Dembelia Sinkunia chiefdom with a population of 20,919 and 21,449(National Population Census, 2015) respectively. There are Two National parks in Koinadugu district which are Loma (33,200 hectares) and Okilima Tambo (23,500 hectares) are closer to the project sites .Different species of wildlife moving between Guinea, Liberia and Sierra Leone into this region and interact with domestic animals such as cattle, sheep, goat, cats and dogs.

The data were obtained by direct observation of the team on the interaction of free-range domestic animals with wildlife in the thick woodland savanna mountainous forest in Dembelia Sinkunia and Folosaba dembelia chiefdoms in Koinadugu district. Information was also obtained from the community people, animal owners on rabies and spread of the disease among animals and humans in their communities.

**Method of selection:** A rapid rural appraisal (RRA) was used to collect information about the most suitable chiefdom and villages to implement the pilot project of which two chiefdoms among the 11 for the implementation of the one health pilot project in the district was selected. Sinkunia and Musaia ranked highest during the RRA. RRA was based on an interview conducted among 110 people interview in Kabala (District headquarter town), Dogolia and Gbindi (cattle market Center).

Five out of seven villages within the two chiefdoms were selected based on a number of small ruminants and wildlife, successful implementation of previous projects, no land dispute or conflict in the last twenty years, respect for paramount chief and chiefdom elders and dog population.

Focus group discussion was organized in the five villages with the active participation of youths, elderly men and women. Ground rules were developed by all the participants

and each participant agreed verbally to consent after the National One Health coordinator read and interpreted the inform consent letter. The research team engaged in focus group discussion comprise of a facilitator, two note takers /secretary, one moderator, and two observers.

**Emphasis of focus group discussion:** Focus group discussion centered on prevalence and common human diseases in their communities, crops cultivated and animals reared, additional inputs requested in the area of agriculture, social amenities and environmental safety facilities. The community profiling was divided into three parts demographic data, social amenities and animal facilities. Individual data entails counting of houses, family heads, total number of people and their sexes. Social profiling include a number of primary and secondary schools ,while health profiling includes number of animals, number of goat, sheep and chicken pens, number of clinics , water wells, latrines and garbage dumps. A school teacher, some youths and members of the research team conducted this exercise after focus group discussion. The community profiling was conducted because of the sizes of the villages. Community participation was free and no food prepared as the exercise lasted for two hours in each village visited. A male and female were appointed to represent each village as contact persons. Their mobile phone numbers or people with mobiles phones in the villages were taken to pass information to two contact persons

**Analysis of Data:** Data collected from the focus group discussion and community profiling exercise were recorded and tabulated, qualitatively analyzed and interpreted.

**Ethical clearance/Inform consent:** No ethical clearance was obtained, but informs consent letter was written, read and

interpreted in their languages in each village visited. The head of the village or town chief sign the inform consent on behalf of the entire town after acceptance by the people

## RESULTS

The research team developed criteria and used the rapid rural appraisal to select five villages out of seven in two chiefdoms to implement the pilot project. The five selected villages are shown in Table 1. Table 2 further presents basic social facilities which were not adequate in all the selected communities. However, three of the five selected villages do not have waste disposal facilities which have serious public health implications and require the attention of health and sanitation personnel and town planning officials. Moreover, all the villages rear animals although three of the villages do not have separate houses for their chickens to sleep. It was observed during community profiling that most of the people sleep with their animals in their houses.

**Table 1:**  
Villages selected for the study

No	Dembelia Chiefdom	Sinkunia	Folosaba Dembelia Chiefdom
1	Sinkunia Town	5	Messiah
2	Manah 1 and Mannah 2	6	Koromasilaia
3	Masendeh	7	Kabakeia *
4	Bantantia *		

\*Villages not selected

**Table 2:**  
Profile of each Community

Structure of Town	Masendeh	Sinkunia	Manah 1&2	Musiah	Koromasilaia
<b>Demographic information</b>					
No of houses	29	191	117	85	85
No of Families	14	352	117	145	159
No of People	92	1834	585	1107	1526
No of Males	47	833	356	417	671
No of Females	45	1001	239	690	855
<b>Social amenities</b>					
No of Wells	1	10	5	2	4
No of Toilets	4	67	16	44	23
No of Primary School	1	1	1	1	1
No of Secondary School	-	1	-	1	1
No of Waste Disposal sites	-	3	4	-	-
Hospitals/Clinics	-	1	1	1	1*
<b>Animal facilities</b>					
No of Goat Pens	5	80	13	27	38
No of Sheep Pens	-	5	10	5	8
No of Chicken Houses	2	-	-	-	7
No of People in Attendance	53	250	160	220	126

• No Health worker in the clinic

Community people used their native intelligence to name all the crops they cultivate, animals reared and diseases associated with these animals as depicted in table 3. Rabies was identified as a zoonotic disease named by the people to aid in the implementation. Table 4 represents additional

Community One Health needs which include additional crops and animals and treatment of diseases affecting their animals, additional social and environmental needs, empowerment of community through training and linking community to markets, formulation of by-laws for compliance and sustainability

**Table 3:**

**Crops and Animals Cultivated and Reared in Pilot Communities and Diseases Affecting Their Animals**

Towns	Masendeh	Sinkunia	Manah 1 & 2	Musaia	Koromasilaia
<b>One Health Needs</b>					
Prevailing/c ommon Diseases	Sacoptic mange, New Castle Disease Peste des Petit Ruminant	Anthrax, Rabies, New Castle Disease and Peste des Petit Ruminant	Rabies, New Castle Disease, Peste des Petit Ruminant	Rabies ,Anthrax, Hemorrhagic Septicemia, and New Castle Disease	New Castle Disease, Peste des Petit Ruminant and Rabies
Crops cultivated	Rice , Groundnut, Bean, Cassava, potatoes	Rice , ground nut, potatoes, Maize, vegetables	Rice cassava	Rice, pepper, groundnut,cassava and vegetable	Vegetables, Rice, Groundnut, Beans, Maize, Cassava, Potatoes, Oil Palm, Mango and Banana
Animals reared	Cow, sheep, goat, fowl, dog and cat.	Cow, sheep, goat, Duck, Guinea fowl, Dog, and cats	Sheep and goat	Sheep, goats, guinea fowl, rabbits, dogs and cats	Sheep, Goat, Fowl, Duck, Pigeon and dogs

**Table 4:**

**Additional Needs Communities to Participate in One Health Activities.**

		Masendeh	Sinkunia	Manah 1&2	Musaia	Koromasilaia
Additional inputs Required	Crops	Vegetable seeds	Vegetable seeds and cocoyam	Rice,cocoyam, and potatoes	Rice, Groundnut,pepper and vegetables	Vegetable seeds,Cocoyam,Fertilizer
	Animal	Work oxen, sheep, goat and duck	Work oxen , sheep, and goat	Work oxen	Sheep and goat	Sheep , Goat and work oxen
Additional Social Facilities Requested	Dustbins	Dustbins/holes	Holes	Holes	Holes	Holes
	Toilets	Toilets	Toilets	Toilets	Toilets	Toilets
	Water	Construction of wells	Water wells	Sinking of wells	Construction and repairs of wells	Sinking of wells
Additional Environmental Safety		Construction of fire belts, establishment and use of by-laws and sensitization	Sensitization of community.	Constructio n of fire belts	Construction of fire belts	Sensitization of community
Remarks		Empower women through vegetable cultivation.	More training and extension services	Need work oxen to increase production	Require viable seed inputs, farm tools, and Training and extension services.	Want to be connected to market centers and want viable Vegetable seeds. Health center, but no medical personnel services.

**DISCUSSION**

This study evaluates the approaches and challenges in implementing One Health concept in rural communities of Sierra Leone. The JEE (2016) report confirm that the country has no one health policy in place which makes the implementation herculean. The ratio of houses to household

families doubled in most rural villages’ samples which mirrored the state of housing in a typical setting in West African and it also revealed the level of poverty and the close proximity of the rural people with their animals which could lead to contracting and spreading of zoonotic diseases. Community profiling as observed in this study help identifying weaknesses in the health sector in these

communities which require one health approach to prevent public health disease epidemic or pandemic in such a densely clustered settlement. These weaknesses were also highlighted by (MOHS, 2009) and further reaffirmed in the JEE REPORT, 2016.

Community profiling as shown further reiterate the need to adopt the most basic survival of Maslow physiological need which is food, water and warmth. These needs and public health issues identified within the villages require various professionals in the human, animal and environmental sectors and the interaction of the trained personnel will address the social, environmental and psychological needs of the people which are now referred to One Health Concept.

For the success of most one health programmes, there is a need to identify the zoonotic disease of interest as opined by Beran et al 2017. Against this background, rabies was identified an entry disease of interest crucial in the implementation of one health project in rural Sierra Leone. Though rabies was identified, the majority of people in the villages were 96% Muslim who dislikes owning and managing dogs. This current altitude further showed why rabies periodically occurs in the area since most dogs in the area are stray and not managed. This clearly showed that for proper one health implementation, food, environmental, social needs, religious and cultural aspect should be taken into consideration before addressing the health or zoonotic needs. These findings are buttressed by Zinsstag et al (2012) who advised for provision private housing needs of the people for the elimination of brucellosis in Mongolia through animal vaccination.

This study clearly showed that for proper implementation of one health concept in a rural setting in West Africa, proper orientation and education of the people on good animal husbandry practices, role and importance of the dog in providing security and in the control of dog-associated rabies (Suluku et al., 2012). Emphasis should also be to ensure the good working relationship between Animal and crop farmers in the context of One Health. This will resolve the long outstanding conflict between the two leading to peace in the community and cooperation in the control of zoonotic diseases using one health approach. This evaluation showed the need to investigate the contribution of dogs to rabies, animal and human security in rural communities

In conclusion, implementing one health requires holistic participation and interdisciplinary integration of all stakeholders not only veterinarians, human doctors or an environmentalist but, anthropologist, sociologist, the community people who are the recipient of the One Health package. This can be done by engaging people through focus group discussion with the stakeholders. This will help one health partners to identify the needs of the people and be able to implement the project well. One Health concept can improve animal and human health, increase income and bring sustainable peace, security and stability in the community.

**Acknowledgement:** Thanks to the United Nations Food and Agricultural Organization Freetown for providing the resources and

Ministry of Agriculture Forestry and Food Security who collaborated with Animal Health Club to implement that pilot project Many thanks to The FAO Country Representative in Sierra Leone Dr Gabriel, Rugalema and FAO programme Manager David Mwesengua who facilitated the grant and all staff of Animal Health Club who compiled and typed that data.

## REFERENCES

- Beran George, Ogunkoya Albert, Emikpe Benjamin, Tasiame William, Jomah Nykoi, Fasunla Ayotunde, Olugasa Babasola (2017):** Rabies elimination as a one-health model for the tropics: can this be a solution to the protracted problem in West Africa? Pan African Medical Journal – 2<sup>nd</sup> international conference on rabies in west Africa RIWA Conference Proceedings. Dec 2017; 5(5): 11. doi:10.11604/pamj.cp.2017.5.11.532
- JEE (2016):** Joint External Evaluation of IHR Core Capacities of the Republic of Sierra Leone Mission report: 31 October – 4 November 2016
- National Report (2004):** National Report On The Implementation Of The United Nations Convention To Combat Desertification (UNCCD) Sierra Leone 2004
- MOHS, (2009)** National Health Sector Strategic Plan 2010–2015 (pdf 1.09Mb). Government of Sierra Leone, Ministry of Health and Sanitation, 2009
- MEST (2013):** Ministry of Education Science and Technology (MEST) conducted school census for the year 2012-2013
- Sierra Leone Livestock Survey, (2017):** [http://www.geographic.org/geographic\\_names/name.php?uni=1905150&fid=5766&c=sierra\\_leone](http://www.geographic.org/geographic_names/name.php?uni=1905150&fid=5766&c=sierra_leone) Copyright © 1995-2012 ITA all rights reserved. Access 17/2/2017 @12:23am Koinadugu district
- National Population Census, (2015):** The Annual Statistical Digest 2007-2013 Edition, 2014, Statistics Sierra Leone (<http://www.statistics.sl>)
- Suluku Roland, Abu-Bakarr Ibrahim., Johnny Jonathan, Jonsyn-Ellis F (2012):** “Post-war Demographic and Ecological Survey of Dog Populations and Their Human Relationships in Sierra Leone. (A Case Study of Urban Freetown)” Science Journal of Agricultural Research & Management, Article ID sjarm-282, 7 Pages, 2012. doi: 10.7237/sjarm/282
- Transparency International Humanitarian Assistance (2015): 27<sup>th</sup> February, 2015(a) Ebola: Corruption and aid
- UNOCHA, (2015):** Sierra Leone: Koinadugu District Profile (04 December 2015) Report from UN Office for the Coordination of Humanitarian Affairs Published on 04 Dec 2015 (access 17/2/2017 @ 3:09)
- Wurie, H., and Witter, S. (2014):** Serving through and after conflict: life histories of health workers in Sierra Leone. **Report for ReBUILD. (2014):** <http://www.rebuildconsortium.com/resources/research-reports/serving-through-and-after-conflict-life-historiesof-health-workers-in-sierra-leone/>
- The World Health Organization (2014):** WHO, *Building Resilient Health Systems*, 11 December 2014
- Zinsstag, J., Meisser, A., Schelling, E., Bonfoh, B. & Tanner, M. (2012):** ‘From “two medicines” to “One Health” and beyond’, Onderstepoort Journal of Veterinary Research 79 (2), Art. #492, 5 pages. <http://dx.doi.org/10.4102/ojvr.v79i2.492>