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Factor 4: Animal Health

Mali: Improving Animal Health to Increase Food Security

In the heart of West Africa, Mali is approximately twice the size of Texas. With a population of 16.8 million and the expectation of doubling the size of its population by 2035, it is expected that food insecurity will be at heightened proportions (“Global”). Mali is the twenty-second most food insecure country in the world in which multiple factors come into play (“Global”). Education, malnutrition and animal health are only some of the factors that affect this country’s insecurity. Mali is known for its high agricultural production, especially livestock, but it also has an exceptionally high disease rate. The vast majority of people rely on agricultural production for their income; 80% of Malians are involved with agricultural labor, in which 20% strictly produce livestock (“Mali”). By providing meaningful education programs to teach Malians about the proper use of effective vaccines, they will be able to improve the health of their livestock, and in doing so increase the output and efficiency of their livestock and ultimately contributing to a more food secure country.

The typical family size in Mali, which has one of the highest fertility rates in Sub-Saharan Africa, is six children per woman (Index Mundi). Most households have parents, grandparents, children and other family members living under the same roof (“Africa”). The majority of the people live in the southern half of the country along the Niger River. Here, small settlements of houses are built with mud walls and thatched roofs (“Africa”). Both men and women complete agricultural tasks like working in the fields and with livestock (“Africa”). The men supply income for their families and make the important decisions, but women do a lot of the work too. Women are highly respected in the family even though the husband is viewed as the leader (“Africa”). The women in the family do all the household chores and take care of the family members living within the home (“Africa”). The women will typically collect water from the river or sell produce at the local markets as part of their daily duties (“Africa”).

Education, which has direct correlation to income and food security, is a factor that when not available or sufficient can have adverse effects for Malians. Generally, education in Mali is very scarce even though the schooling is free (“Africa”). Although education in Mali is free, few children attend school (“Issues”). With the cost of supplies, uniforms and other factors, parents often cannot afford to take their kids to school. Since there is a scarcity in education, most of the children are not literate. There is also a significant shortage of schools. If the schools are nearby, it is usually at least a three mile walk to the school destination (“Issues”). Girls are even more likely to not attend school because they are needed to do work at home. If the kids do attend school, it will most likely be when they are between the age of 9-18 (“Issues”).

“Access to health care is very uncommon with only one doctor for every 18,376 people” (“Culture”). Clinics are very under equipped and patients often have to provide their own supplies needed for treatment. In the very few clinics they have, most are based in urban areas, but urban areas actually make up a smaller percent of the population. Statistics also show that 1 in 5 children will die before the age of five because of the unavailability of proper medical care (“Culture”). Households only have a 33% chance of a member to have an ITN. An ITN is an insecticide -treated bed net. Without these nets, malaria is caused because of the lack of vaccines. Instead of improving sanitation, there has been a decline of 75.3% in proper sanitation equipment (“Culture”). Most Malians still commonly use natural herbs or traditional

home remedies for illness (“Africa”). However, this is often not effective for certain diseases, especially diseases such as HIVS/AIDS.

20% of the population live in urban areas which is where the markets are located and agricultural products are sold weekly (“Africa”). An example would be Bamako, which is the largest city and capital of the country (“Mali”). Typical items sold are vegetables, meat, handicrafts, and other handmade items (“Africa”). Produce makes up the bulk of the items sold (“Africa”). The usual price of a fish filet is less than 2.50 a pound in American dollars and beef is sold for 1.64 a pound in local markets (“Food”). The usual wage for urban workers earn between 60 to 160 dollars per month from selling their ag produce at the market (“Africa”). Farmers profit 44 cents out of every dollar in the markets (“Africa”). With production in the market, high agricultural production is needed because there is high demand in the markets that the farmers need to produce a lot to meet that demand.

Crop and other agricultural lands cover 64% of Mali (“Food”). In Mali, most farmers are subsistence farmers, which rely on rainfall to feed their crops on small pieces of land (Coulibaly). A subsistence farmer focuses on growing enough food to feed themselves and their families (Coulibaly). The farm size is all dependent on the farmer and the area in Mali where the farmer lives (“Food”). Usually, the average farm is 4.7 hectares, which is about 12 acres (“Africa”). Cotton is the main cash crop being the most exported item in Mali. Nomadic stock rearing is practiced frequently and is characterized by frequent movements of the herders and their livestock, according to the availability of their resources (“Food”). Permanent livestock farms are also common, raising mostly cattle, sheep and goats (“Africa”). There are also a lot of transhumant systems, which involve the movement of the headers and livestock based on the rainfed and rain-falling agricultural system (“Food”). It takes the herders from the south to the north on rainy season and the drying of water holes (Coulibaly). The search for water becomes a frequent problem, so moving the livestock is essential for survival of the livestock and economy for the herders.

The typical diet for a rural family is millet, rice, or sorghum, with fish from the Niger river (“Africa”). These same products are also sold to markets, where Malians make most of their income. Typical dishes come with smoked beef, lamb, chicken or fish with rice or millet on the side (Karaimu). Some of these specific dishes are called Poulet Yassa or Fouto (“Global”). Meat is essential in Mali because meat provides iron, vitamin B, fat soluble vitamins, vitamin A, and protein. Protein provides for nutrient deficiencies in developing countries. It also contributes to high income and by products for families to use.

Over half of the country is surviving on a dollar or less a day. Although Mali has primary exports, the country has to import many of the goods they need (“Africa”). Mali struggles with a trade deficit, which is spending more money on imported goods than is made from exportation. There have been many reforms aimed at improving the economy and food security over the last five years, but they have been undercut by the ongoing political instability (“Issues”). The judicial system has caused limitations that have not allowed full initialization of other reforms for a better trade system and economy (“Heritage”). Mali is even 4.5% lower in their economy than the world average. Even though Mali has benefited from debt relief, the country is still highly reliant on foreign aid.

Despite foreign aid, Mali continues to suffer from poverty and food insecurity. “Food insecurity is the state of being without reliable access to a sufficient quantity of affordable, nutritious food” (“Dictionary”). With this being the overall issue, it addresses one of humankind’s most fundamental needs: access to a nutritious and adequate diet (“Heritage”). Because Sub-Saharan Africa is one of the most concentrated areas of food insecurity, it is an important issue to address. Lack of investment from

the Mali government is a frequent issue that slows growth with only a minor of 2.3% GDP towards improvements. Poor distribution of wealth adversely affects food insecurity. With 10% of Malians earning 1.8 dollar per capita, Mali has one of the worst income rates in the world (“Mali”). Gender inequality is another contributing factor with Mali being rated at 0.689 in the Gender Inequality Index (“Organization”). “A study of developing countries found that 4.3% of reduction of hunger was due to an increase in women’s education. (“Mali”). Women have 17% less literacy rate than men, but still even men only have a literacy rate of 56% (“Mali”).

Market access is also a major factor, as Mali has a lack of access to markets which causes fluctuations in food prices. This produces a damaged economy (“Pathways”). Mali is in essential need of more inclusive and efficient markets because of the lack leadership and entrepreneurship. It is in need of a value chain approach and developing a more inclusive and efficient markets (“Pathways”). There is also a lack of knowledge in sustainable agriculture like the practices of small irrigation, irrigated management of vegetable nutrients, diversification of crop varieties and other obstacles that are in need of adjustment (“Pathways”). What this would require from the country is to develop higher quality meat and generate more income for the Malian farmers. This can be done by the implementation of vaccines to the livestock and educational programs to create more healthy, sellable livestock. This may not be an immediate impact, but it will for sure lead to long term reductions in crop yield and soil health. Each of these current factors makes up the bigger picture of food insecurity.

Animal health is one crucial factor affecting Mali’s food insecurity. Livestock is of key economic and social importance to Mali in both household and national importance (“Pathways”). The government of Mali has the potential to transform the livestock export sector and become a regional supplier of meat and animal by-products. The trend of food insecurity is worsening due to continued trends of poor animal health that was exacerbated by the large drought that began in 2004 and continues to be an issues (Coulibaly). The millet prices are growing rapidly, while livestock prices have been dropping (Coulibaly). This creates a problem in the way that it’s harder to buy feed and a lack of feed contributes to poor health. Livestock health has been deteriorating as well due to the scarcity of water and grazing pastures (“Food”). Malnutrition is another growing trend caused by this factor as meat serves as an important protein, Iron, and B12 source. Improving animal health will supply more meat helping to alleviate food insecurity and malnutrition.

Since over 80% of Malians are involved in agriculture, animal health not only affects food security, but also creates direct health issues for Malians. Transboundary animal diseases have been affecting livestock production for an immeasurable amount of time (“Food”). The movement of animal diseases across the area is a serious threat to Mali (“Organization”). The movement of animals and products in Mali have caused animal diseases to increase and spread across the region (Coulibaly). The list of exotic and zoonotic diseases has grown, while little progress has been made in controlling pathogens (“Food”). Zoonotic diseases are diseases that can be transferred to humans from animals (“Dictionary”). Poor animal health can lead to an increase in zoonotic diseases and increase the likelihood of human illness, which in turn can affect household income and food availability. While Mali is very high in their agricultural output among African countries, the success or failure of their crops and forages are based on rainfall and location in the country (Coulibaly). The northern pastoral zone and Niger River zone have the highest percentage of livestock production; these areas also inhabit the largest percentage of Mali’s population (“Food”). The predominant livestock animal in central Mali is the Sudanese Fulani, a breed of cattle that is used regularly in the livestock industry (Coulibaly).

The availability and quality of food is affected greatly by animal diseases (“Food”). This generates problems through loss of animals. Rinderpest, an acute infectious disease, has killed a large percentage of livestock. The current human influenza due to the H1N1 virus has spread not only in Mali, but is spreading at exceptional speed worldwide (Coulibaly). Foot and mouth disease is also an epidemic that affects 500,000 people each year and kills more than 3 million animals each year (Coulibaly). In 1998 the Rift Valley disease affected thousands of people and animals. This dangerous zoonotic disease, had the potential of wiping out millions of people. When diseases reduce the number of healthy livestock, this decreases Malians’ household income by billions of dollars. In turn, the decreased sales means an increase in meat shortages across the country. The shortage of meat can contribute to inadequate nutrition for families and kids. Because of the lack of quality meat, many people experience malnourishment related to specific nutrients. As livestock production modernizes and becomes more concentrated, animal health is even more important. Incidence and risks of transboundary diseases, including zoonotic diseases, are expected to rise. “The higher density of domestic animals and humans, the projected increase in transcontinental movement of people and animals, and changes in ecosystems create a conducive environment for the rapid emergence, amplification and spread of pathogens” (“Food”). With some disease outbreaks lead to trade being cut off by other countries. This demonstrates another way livestock diseases impair livelihoods of human beings due to a lack of demand resulting from suspended trade (“Food”). This is why there needs to be a solution to help solve some of these severe issues.

The present status of animal health is declining at a rapid rate. With the presence of zoonotic and animal diseases, many African countries are unable to create adequate safety in their production, limiting their ability to trade globally (Coulibaly). The livestock subsector supports food security and the livelihoods of over one million people in Mali. Production and trade of animals and animal products are important for the economic development of countries and represent a key income source for the rural poor worldwide.

Improving animal health will improve food supply and/or income available to families by providing healthier livestock in larger numbers. Environmental factors can affect animal health in a very substantial way. Factors such as rainfall and wind direction affect the density and the distribution of mosquitos (“Africa”). This causes a direct effect on the risk factor of animals acquiring diseases. Population is another threat that causes issues. Increasing population in rural areas displaces livestock from grazing land. This expansion of population into rural areas causes less and less water available to livestock (“World Food”). Due to a lack of feed resources, farmers are constantly on the move. Instead of being able to target livestock disease treatment and prevention in one area, it can often spread all across the country due to the transient nature of many livestock producers. .

Each of these factors contributes to the worsening animal health situation. Strengthening the capacities of national and veterinary health services should be a top priority in Mali (Coulibaly). FSIS veterinarians (USDA Food Safety and Inspection Service) would be an option to implement training programs. According to the FAO, “This includes development of self-reliant training capacities, development of appropriate legal and policy frameworks, introduction of economic and environmentally sound coping technologies, building national surveillance and diagnostic systems, support to adequate infrastructure and tools, and practised contingency plans and field exercises” (“Food”). This can help contain and prevent specific diseases, but long term preventative solutions need to be developed by the Malian government and livestock producers.

One way to help effectively solve this issue, new vaccines need to be developed and/or implemented to help prevent deadly diseases. To solve this situation, there needs to be specific global product development and distribution. Education programs must be established to teach producers the proper use

of vaccines. Limiting border crossing with livestock between neighboring countries, increasing support in the DNSV (Veterinary Public Health and Inspection Agency) and facilitating investment in high quality meat production may be part of the solution for improving animal health. There are five important steps in developing a vaccine: research, clinical evaluation, licensure, production and manufacturing. Locally based research will first need be used to determine the disease strains vaccines are needed to prevent and to due some of the early development. Crimean-Congo Hemorrhagic Fever is a common disease that develops after an animal is exposed and is transmitted through contact of animal blood. Rift Valley Fever is also a very common disease, that is a viral disease transmitted from domesticated animals causing liver inactivity (“Economy”). Both of these are examples of contagious zoonotic diseases that have occurred in Mali. With local based research, funded by the government, on these dangerous and powerful diseases, there could be a creation of a new or more effective vaccines for livestock. However, large research operations become very expensive and complicated. By partnering with NGOs, governments and universities, this large-scale research is attainable. Once a vaccine is developed, distribution and education on the vaccine would have to be facilitate. To do this NGOs could be utilized in partnership with the government. One Acre Fund, an NGO in Kenya, not only distribute seed and fertilizer but they also trained farmers in financing for farm inputs as well as agricultural techniques and market facilitation to maximize profits from harvest sales (“Heritage”). If the Malian government could connect with One Acre Fund or emulate their approach to implement their program in Mali or use similar NGOs like BRAC, they can create strong programs for livestock producers.

Funding plays a vital role if the development of any new vaccines for Malian livestock is to come to fruition. To help facilitate funding I would suggest partnering with private industry and universities in the United States. Land Grant Universities such as Oklahoma State use their programs to test new and effective vaccines. Malian universities can in turn be used for testing and data. Mali has an agricultural university called AAU. By connecting these institutions and organizations, there can be a development of an effective vaccine. To combat possible cost issues for Malian livestock producers, microloans from the World Bank may be used for the initial purchase of vaccines, but improvements in animal health as a result of these vaccines will ideally increase farmers’ profits to the point where they no longer need the loans to support themselves. It will be important to research testing procedures necessary to export livestock and their products as certain vaccines may actually trigger a positive test for a disease they don’t actually have which would prevent exportation.

Angola, Africa used an approach for distribution that may offer some ideas of use. By pairing up with the military, the country was able to administer vaccines with helicopters and military vehicles to reach inaccessible places of the country. The situation was caused by the lack of inaccessible zones and districts due to insecurity and poor infrastructure (“Heritage”). Partnership with the Angolan Army Health Service was used as one of the strategies used for campaigns and distribution in insecure and hard to reach zones (“Heritage”). The partnership created high level advocacy and top military decision. With the development and funding of a vaccine, they were able to save thousands of animal and human lives (“Heritage”). However, it is not suggested to implement this exact method because of the low aircraft strength of a total of fourteen aircrafts. This would result in extended periods of distribution and would not be administered quickly enough in times of emergency. From the previous example, Mali would need to develop an approach using local resources for distribution whether that be military or NGOs. If an effective vaccine program for Mali’s livestock is used there will be an increase in health rate. Strong education programs need to be developed to help in the implementation of the product.

Utilizing FSIS veterinarians in Mali, families will be able to improve and sustain livestock health as a result of the strong education programs. These veterinarians only respond to emergency situations and

provide long term education solutions for these countries. FSIS veterinarians, in collaboration with local health departments and the Centers for Disease Control, investigate outbreaks of foodborne illness (“FSIS”). With supportive training from these vets, the animal health status and in turn, human health, in Mali will improve (“FSIS”). The FSIS also travels to other countries in collaboration with education programs. With collaboration with these programs, these veterinarians could teach families how to utilize vaccines to improve the health of the animals and design new inspection systems and procedures (“FSIS”). USAID can also be a foundation to establish stronger education programs in Mali. USAID could train teachers in over 2,500 schools, strengthen the accountability of school management, and reach out to unemployed youth of both sexes (Gordon). This would create long term investments in the quality of education and teach people to maintain proper animal health practices. Education programs are used for the use of vaccines and to reach out to men and women in education because it’s transformational. Rural farmer children will be of key importance in this process by learning from these education programs, which have proven to be very attainable in other countries. The benefit to farmers is increased profit and more developed farms.

By successfully introducing new vaccines and implementing education programs to teach how to use them, farmers will see healthier livestock, ultimately leading to increased yields. Mali has a number of food insecurity issues including lack of stable incomes, gender inequality, education, lack of market access, low literacy rates and other factors that contribute to this problem. Food insecurity is an incredibly complex issue, but improvements in animal health could help in one aspect to get Mali headed in the right direction toward solving their food security problems. With the production of a new or improved vaccines that can prevent animal diseases, including zoonotic diseases, there can be significant change in Mali. Partnerships with NGOs and IGOs, such as USAID, can create strong education programs to teach Malians about proper use of the vaccines. If the vaccines are used, there will be increased health of livestock and humans. Not all of Mali’s food insecurity issues can be solved at once, but with continuous research and development, Mali has the potential for a bright and prosperous future.

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