



WORKSHOP SUMMARY

# One Health Zoonotic Disease Prioritization for Multisectoral Engagement in Burkina Faso



Ouagadougou, Burkina Faso



**USAID**  
FROM THE AMERICAN PEOPLE



Food and Agriculture  
Organization of the  
United Nations

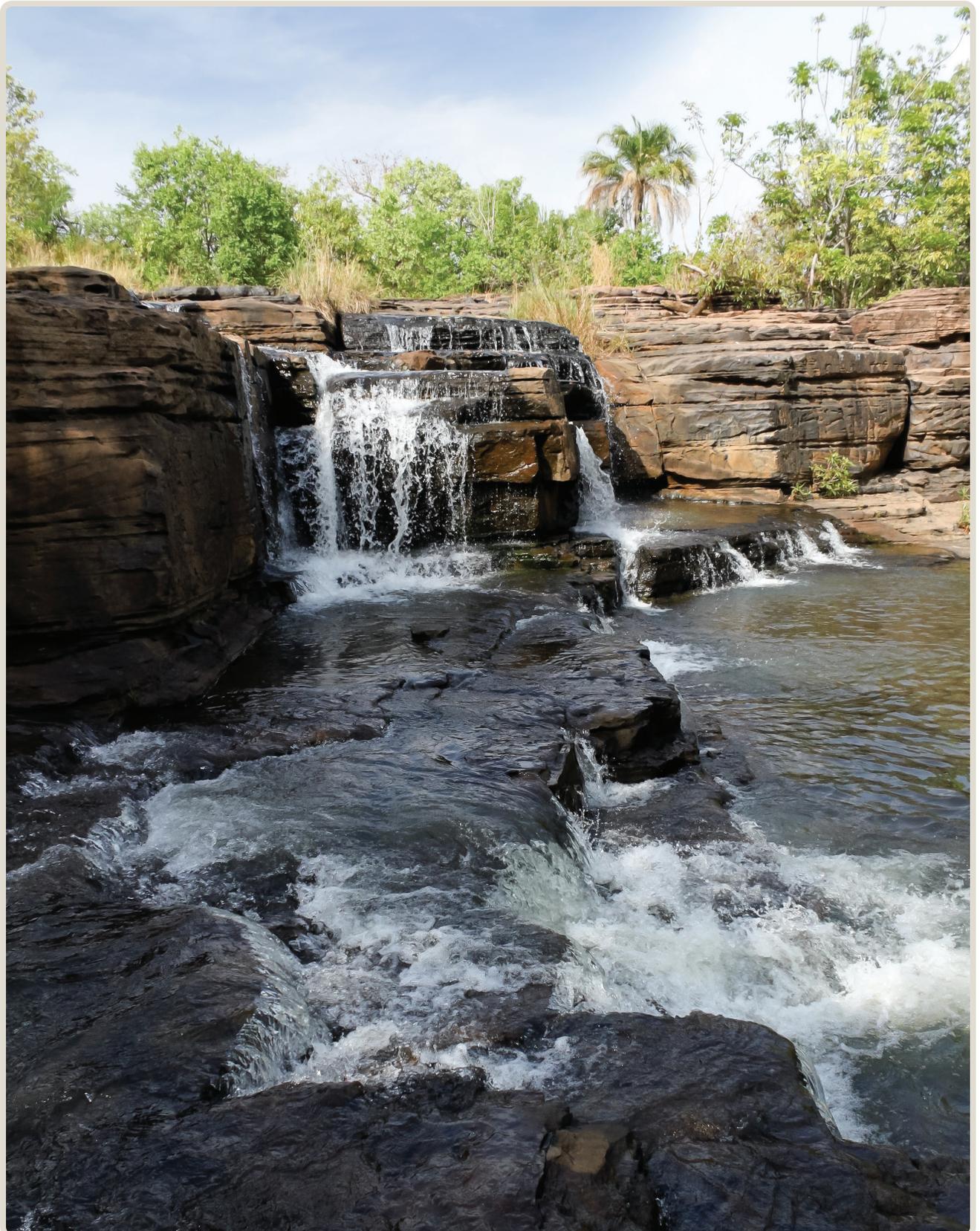


Photo 1. The basin of a waterfall of Banfora in Burkina Faso.

## TABLE OF CONTENTS

Executive Summary .....	1
Background .....	3
Workshop Methods .....	4
Prioritization Process .....	4
Criteria Selected for Ranking Zoonotic Diseases .....	5
Plans and Recommendations .....	6
General Recommendations .....	6
Specific Next Steps .....	7
Appendix 1: Overview of the One Health Zoonotic Disease Prioritization Process.....	9
Appendix 2: One Health Zoonotic Disease Prioritization Workshop Participants for Burkina Faso .....	10
Appendix 3: Final Results of One Health Zoonotic Disease Prioritization Workshop in Burkina Faso.....	12
Appendix 4: The Numerical Weights for the Criteria Selected for Ranking Zoonotic Diseases in Burkina Faso.....	13
References .....	14



Photo 2. Girl from a local village in Burkina Faso carrying fruits and vegetables.

## EXECUTIVE SUMMARY

Zoonotic diseases are diseases capable of spreading between animals and humans. Most known human infectious diseases and about three-quarters of newly emerging infections originate from animals. Some zoonoses pose a significant threat to human public health, while others may have tremendous agricultural and social or economic impacts. The cross-sectoral nature of zoonotic diseases has historically been a challenge in preparing for and responding to zoonotic disease threats at the animal-human-environment interface, highlighting the critical need for a multisectoral and interdisciplinary One Health approach to address these emerging health threats.

Global security frameworks, including the Global Health Security Agenda (GHS A) and International Health Regulations (IHR-2005), recommend that countries strengthen their surveillance capacity for zoonotic diseases. As part of implementing this recommendation, Burkina Faso conducted a multisectoral, One Health Zoonotic Disease Prioritization workshop.

The purpose of this 2-day One Health Zoonotic Disease Prioritization Workshop was to identify zoonotic diseases of greatest national concern for Burkina Faso using equal input from representatives of human health, animal resources, and the environment. During the workshop, representatives identified a list of zoonotic diseases relevant for Burkina Faso, defined the criteria for prioritization, and determined questions and weights relevant to each criterion. Five zoonotic diseases were identified as a priority by participants using a semi-quantitative selection tool, the One Health Zoonotic Disease Prioritization tool, developed and coordinated by the US Centers for Disease Control and Prevention (CDC) (Appendix A).<sup>1,2</sup>

The prioritized zoonotic diseases for Burkina Faso were anthrax, rabies, highly pathogenic avian influenza, brucellosis, and dengue (Table 1). The final results of the One Health prioritization process and normalized weights for all zoonotic diseases discussed in Burkina Faso are shown in Appendix B. This report summarizes the One Health process used to prioritize the top zoonotic diseases for Burkina Faso that should be jointly addressed using a multisectoral, One Health approach including human, animal, and environmental health ministries and other sectors relevant to the prioritized zoonotic diseases.



**Photo 3. One Health Zoonotic Disease Prioritization workshop participants in Ouagadougou, Burkina Faso.**

**Table 1. Description of priority zoonotic diseases selected in Burkina Faso by participants using a multisectoral process in the One Health Zoonotic Disease Prioritization Workshop conducted in August 2017**

Zoonotic Disease	Causative Agent	Human Disease Burden	Animal Disease Burden	Diagnostics, Treatment, and Prevention
<b>Anthrax (<i>Bacillus anthracis</i>)</b>	Bacteria	Exact numbers are unknown but confirmed and suspect cases are reported (most recently in 2017). <sup>3</sup> One confirmed human case was reported in 2016, 8 human cases in 2015, and 1,244 human cases in 2014 from Burkina Faso. <sup>4</sup>	In April 2017, an outbreak of anthrax among animals was reported (unpublished data).	An effective vaccine exists for both animals and humans; treatment in humans includes antibiotics. <sup>5</sup>
<b>Rabies (<i>Rabies virus</i>)</b>	Virus	Rabies cases and deaths occur annually in Burkina Faso. There were 14 cases in 2016, 15 in 2015, and 21 in 2014; all cases died. <sup>6</sup>	In Burkina Faso, rabies virus is actively circulating in dogs, cats, and monkeys. <sup>7</sup> Most exposures are from domestic dogs. <sup>8</sup>	Effective animal vaccine exists and human vaccines are available at certain health centers. Post-exposure prophylaxis is available. Treatment is supportive.
<b>Highly pathogenic avian influenza (HPAI)</b>	Virus	No cases have been reported in Burkina Faso, but isolated cases have occurred in the region. <sup>9,10</sup>	In 2006, prevalence was found in hooded vultures in Ouagadougou, and one domestic guinea fowl and backyard chickens in Dioulasso, Tenado, and Sokoroni. <sup>11</sup> In 2015, reporting of HPAI in poultry in 10 regions. <sup>12</sup>	No vaccine or treatment is available. <sup>13</sup>
<b>Brucellosis (<i>Brucella spp.</i>)</b>	Bacteria	Brucellosis exists throughout Sub-Saharan Africa. <sup>14</sup> Burkina Faso does not have a surveillance program so prevalence is unknown. <sup>15</sup>	<i>Brucella</i> affects cattle and goats worldwide. Cattle and goats tested positive for <i>Brucella</i> within Burkina Faso in two small-scale studies. <sup>16,17</sup>	A vaccine is available for animals and treatment with antibiotics is available for humans. <sup>18</sup>
<b>Dengue</b>	Virus	A large outbreak of dengue occurred in 2016. There were over 1,000 probable cases and 1,200 suspected cases in the 12 districts of Ouagadougou; there were 15 deaths. <sup>19</sup>	Animals are not known to be affected by dengue.	A vaccine is available in humans, but only in certain countries. <sup>20</sup> There is no treatment available. <sup>21</sup>

## BACKGROUND

Burkina Faso is particularly vulnerable to the effects of zoonotic diseases because over 80% of the population is engaged in agriculture, with almost all of the population involved in livestock farming.<sup>22</sup> In 2014, Burkina Faso had more than 9 million cattle, 13 million goats, 9 million sheep, 42 million of various poultry,<sup>23</sup> and 15,000 camels.<sup>24</sup> Agriculture accounts for 32% of Burkina Faso's gross domestic product (GDP).<sup>25–27</sup> Burkina Faso is a land-locked, French-speaking, West African country, bordered by Ghana, Côte d'Ivoire, Togo, and Benin to the south, Niger to the east, and Mali to the north and west. The capital and economic center of the country is Ouagadougou. Over 70% of the population lives in rural settings,<sup>25–27</sup> and the land is dominated by savannah in the north and forest in the south. There are two distinct seasons in Burkina Faso: the rainy season (from June to September) and the dry season (from October to May).<sup>28</sup> The long dry season makes produce and land cultivation of crops difficult, but allows for livestock rearing and exportation.

Zoonotic diseases that occur in large numbers can impact society in three main ways:

- Threaten the health of animals resulting in illness, loss of productivity, and death.
- Threaten the livelihood of a large segment of the population dependent on livestock as a major source of income.
- Threaten the health of people, with the ability to cause a large number of illness and death, which is associated with significant social and economic losses.

To begin addressing zoonotic disease challenges in Burkina Faso, a One Health Zoonotic Disease Prioritization Workshop was held in August 2017 at the Royal Beach Hotel in Ouagadougou. The specific



goal of the 2-day prioritization process was to use a multisectoral, One Health approach to prioritize endemic and emerging zoonotic diseases of major public health concern that should be jointly addressed by human, animal, and environmental health ministries and other sectors relevant to the prioritized zoonotic diseases for Burkina Faso. The effort was supported by the Government of Burkina Faso, CDC, the United States Agency for International Development (USAID), and the Food and Agriculture Organization (FAO).

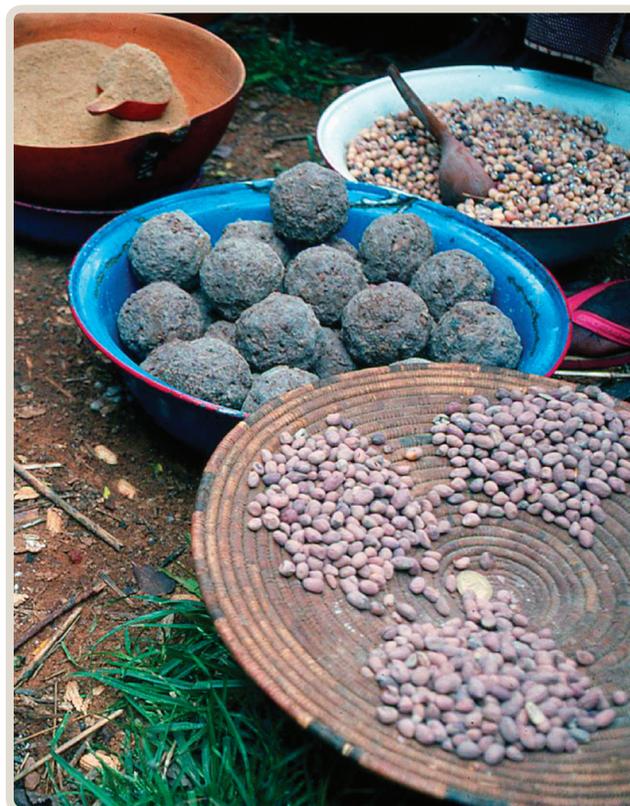
In order to build in-country capacity to conduct future One Health prioritization workshops, three local partners were trained by CDC facilitators. Six facilitators representing human, animal, and environmental health sectors were trained, including two from the Ministry of Health, two from the Ministry of the Animal Resources and Fisheries, and two from the Ministry of the Environment, Green Economy and Climate Change. Partners including representatives from USAID and FAO were also in attendance for the training.

## WORKSHOP METHODS

### PRIORITIZATION PROCESS

The prioritization process involved a semi-quantitative tool developed by CDC. The methods are described in detail in Appendix A.<sup>2</sup> The first step of the process was to identify a country-specific list of potential zoonotic diseases of concern. A disease was selected if it was known to be passed between animals and people and thought to occur in Burkina Faso or the surrounding region. A list of 41 zoonotic diseases, shown in Table 2 of Appendix C, was considered during the prioritization workshop. Next, the workshop participants jointly identified five criteria for quantitative ranking of these 41 zoonotic diseases. Once the five criteria were chosen, each member of the selection committee individually indicated his or her preferences for the relative importance of each criterion to help generate a final group of weights for each criterion. The criteria and weights assigned to each criterion are listed in Appendix D.

One categorical question for each criterion was selected through group discussion. All questions had ordinal multinomial (1–5%, 5–10%, 10–20%, etc.) answers. The ordinal nature is necessary for the scoring process, and is determined by the participants and the available data. Data were identified through an extensive literature search, as well as information from WHO, OIE, ProMED, and other relevant websites. Data on incidence, prevalence, morbidity, disability-adjusted life years (DALYs), and mortality were collected for the selected zoonotic diseases. If disease information for a particular zoonotic disease was not available for Burkina Faso, data for other West African countries were used. If regional data were not available, global disease data on prevalence, incidence, morbidity, mortality, and DALYs were used. Over 350 articles were collected with disease-specific information on prevalence, morbidity, mortality, and DALYs for the West African region, including those of other African countries. These articles were saved as PDFs, loaded onto an external storage device (USB key), and given to the workshop participants for reference.



**Photo 4. Typical market foods and grains on sale in the outdoor market in Ouahigouya, Burkina Faso.**

A decision tree in Microsoft Excel™ was used for determining the final disease ranking. Each weighted criterion was applied across all diseases, and scores were assigned based on the response to each question. Country-specific, regional, and global data compiled previously for all zoonotic diseases under consideration were used to determine appropriate responses for each question. The scores for all five questions were summed and then normalized such that the highest final score was 1. See Table 2 in Appendix C for a complete listing of normalized scores for all zoonotic diseases that were considered in the workshop.

The list of zoonotic diseases and their normalized scores was presented to the group for discussion. A panel of nine representatives from different sectors voted on a final list of 41 zoonotic diseases (Table 1). After discussion, the representatives opted to remove leptospirosis and bovine tuberculosis and add dengue and highly pathogenic avian influenza in their place.

## CRITERIA SELECTED FOR RANKING ZOOONOTIC DISEASES

The criteria for ranking zoonotic diseases selected by the voting members in Burkina Faso are listed in order of importance below (Appendix D).

### 1. Gravity of disease

Gravity of the disease was the most important criterion. Diseases that have a high lethality (case-fatality rate) OR a high incidence were ranked highly. Diseases with a case-fatality rate >10% or an incidence >10/10,000 received the full weight score of 2. Diseases with a case-fatality rate <10% or an incidence <10/10,000 % received a score of 0.

### 2. Presence of the disease in Burkina Faso or the sub-region

If the disease is present in either the sub-region or Burkina Faso was the second most important criterion. If the disease is present in the sub-region AND Burkina Faso, the disease received the highest score of 3. If the disease is not in the sub-region, but is in Burkina Faso, the disease received a score of 2. If the disease is in the sub-region, but not in Burkina Faso, the disease received a score of 1. If the disease is in neither the sub-region nor Burkina Faso, the disease received a score of 0.

### 3. Socioeconomic and environmental impact

If the disease causes long-term human disability and/or high animal morbidity was the third most important criterion. If the disease causes human disability AND high animal morbidity (defined as any morbidity >40%), the disease received the highest score of 2. If the disease causes long-term human disability only, it received a score of 1. If the disease causes high animal morbidity only (>40%), the disease also received a score of 1. Diseases that do not cause human disability or high animal morbidity (>40%) received the score of 0.

### 4. Control measures

Whether a disease has a vaccine or treatment was the fourth criterion. If the zoonotic disease has both a vaccine and effective treatment (in humans or animals), the disease was given a score of 3. If the zoonotic disease has a vaccine OR an effective treatment (in humans or animals), the disease was given a score of 1. If neither a vaccine nor effective treatment (in humans or animals) exists, the disease was given a score of 0.

### 5. Bioterrorism potential

The potential of the disease to be used for bioterrorism was the fifth criterion. If the pathogen or toxin is able to serve as a biologic agent for terrorism, the disease was given the full weight score of 1. If the pathogen or toxin is not able to serve as a biologic agent for terrorism, it was given a score of 0.



**Photo 5. A meeting place within the Kurumba Village in Toulfe Sahel.**

## PLANS AND RECOMMENDATIONS

### GENERAL RECOMMENDATIONS

After finalizing the list of priority zoonotic diseases, the workshop participants discussed recommendations and further actions that could be taken to address the prioritized zoonotic diseases. This was done in a two-stage process. To begin, participants were asked to make general recommendations for how to approach the priority diseases without considering the constraints of their respective institution. A summary of the most prominent recommendations organized by theme follows:

#### • One Health Platform

- PRINCIPLE RECOMMENDATION:
  - › The One Health Platform needs to be operationalized by the government, as it currently exists only conceptually
- SECONDARY RECOMMENDATION(S):
  - › Identification of One Health focal points from each of the ministries

#### • Laboratory Capacity

- PRINCIPLE RECOMMENDATION:
  - › Strengthen the capacity of the laboratory sectors (animal and human) to diagnose the prioritized diseases in both animals and humans
- SECONDARY RECOMMENDATION(S):
  - › Reinforce the collaboration between the three sectors to ensure all have diagnostic testing capacity for the five prioritized zoonotic diseases

#### • Surveillance

- PRINCIPLE RECOMMENDATION:
  - › Ensure the list of the five priority zoonotic diseases is widely shared to ensure that all stakeholders are aware of the findings
- SECONDARY RECOMMENDATION(S):
  - › Perform capacity-building of the staff in all sectors to identify each of the diseases in the field
  - › Reinforce the collaboration between the three sectors to ensure all have surveillance capacity for the five prioritized zoonotic diseases

#### • Outbreak Response

- PRINCIPLE RECOMMENDATION:
  - › If strategic response plans are already available, they must be adapted to the current list of prioritized zoonotic diseases and implemented/operationalized
- SECONDARY RECOMMENDATION(S):
  - › Train staff to respond in the event of a breakout of a highly pathogenic organism/disease (e.g., highly pathogenic avian influenza)
  - › Develop response plans for those priority diseases that do not already have a plan

#### • Prevention and Control

- PRINCIPLE RECOMMENDATION:
  - › Strengthen overall multisectoral, One Health coordination, communication, collaboration, and information sharing among all sectors



**Photo 6.** Giant African spurred tortoise (*Centrochelys sulcata*), also called the sulcata tortoise, is a species of tortoise that inhabits the southern edge of the Sahara Desert.

## SPECIFIC NEXT STEPS

Finally, each government ministry involved in the decision process and the collaborating agencies that observed the process were given an opportunity to make suggestions for specific next steps that ministries could take to improve the multisectoral development of laboratory capacity, surveillance, joint outbreak response activities, and prevention and control strategies. A summary of the next steps suggested by each sector follows:

### • Ministry of Health

- Assess laboratory capacity and strengthen the ability to diagnose the priority diseases with assistance from external partners
- Develop national action plans for the prioritized zoonotic diseases in collaboration with other sectors
- Assist with the development of national action plans for the prioritized zoonotic diseases
- Collaborate with the other sectors to ensure all have diagnostic testing capacity and surveillance for the five prioritized zoonotic diseases

### • Ministry of Environment, Green Economy and Climate Change

- Assess laboratory capacity and strengthen the ability to diagnose the priority diseases with assistance from external partners
- Strengthen logistics of outbreak response since these do not currently exist in this sector
- Assist with the development of national action plans for the prioritized zoonotic diseases
- Collaborate with the other sectors to ensure all have diagnostic testing capacity and surveillance for the five prioritized zoonotic diseases



Photo 7. The sacred catfish of Burkina Faso.

### • Ministry of Animal Resources and Fisheries

- Assess laboratory capacity and strengthen the ability to diagnose the priority diseases with assistance from external partners
- Assist with the development of national action plans for the prioritized zoonotic diseases
- Collaborate with the other sectors to ensure all have diagnostic testing capacity and surveillance for the five prioritized zoonotic diseases

### • International Partners

- FAO will circulate the final report widely to ensure all sectors are aware of the prioritized zoonotic diseases
- Provide resources as applicable to strengthen laboratory diagnostic capacity for the prioritized zoonotic diseases
- Provide technical support and assistance on any of the prioritized zoonotic diseases
- Support the operationalization of the national One Health Platform for Burkina Faso as part of GHSA
- Support the strengthening of multisectoral, One Health capacity (coordination, collaboration, and communication)

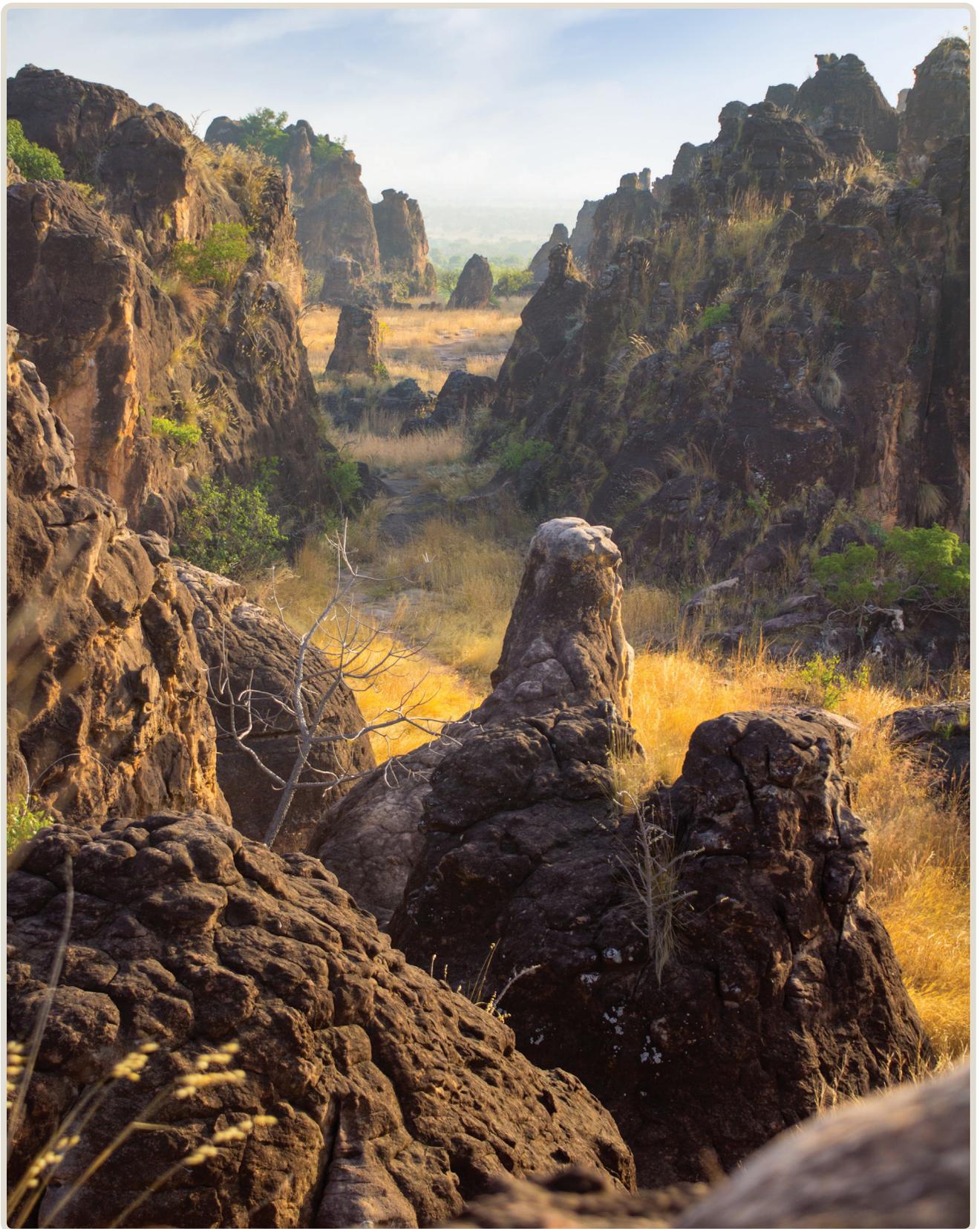


Photo 8. Sindou Peaks, Burkina Faso.

## APPENDIX 1: Overview of the One Health Zoonotic Disease Prioritization Process

### BEFORE THE WORKSHOP

<b>STEP</b> <b>1</b>	<b>PREPARE FOR THE WORKSHOP</b> <ul style="list-style-type: none"> <li>• Contact the CDC One Health Office at least 60 days before the workshop</li> <li>• Work with in-country leadership to identify 8 to 12 voting members from all relevant sectors to participate in facilitated group work</li> <li>• Clearly define the purpose and goal of the workshop with all sectors to be represented</li> <li>• Generate a list of all endemic and/or emerging zoonoses to be considered for ranking; include input from all represented sectors                             <ul style="list-style-type: none"> <li>» Note: Involves gathering reportable diseases lists</li> </ul> </li> </ul>
-------------------------	---

### DURING THE WORKSHOP

<b>STEP</b> <b>2</b>	<b>DEVELOP CRITERIA</b> <ul style="list-style-type: none"> <li>• Identify 5 criteria that will be used to define the relative national importance of the list of zoonoses; criteria should be locally appropriate and agreed upon by voting members</li> </ul>
<b>STEP</b> <b>3</b>	<b>DEVELOP QUESTIONS</b> <ul style="list-style-type: none"> <li>• Develop one categorical question for each of the selected criteria</li> </ul>
<b>STEP</b> <b>4</b>	<b>RANK CRITERIA</b> <ul style="list-style-type: none"> <li>• Each voting member individually ranks the selected criteria; individual scores are combined to produce an overall ranked list of criteria</li> </ul>
<b>STEP</b> <b>5</b>	<b>PRIORITIZE ZOOONOTIC DISEASES</b> <ul style="list-style-type: none"> <li>• Score each zoonotic disease based on the answers to the categorical questions for each weighted criterion using the One Health Zoonotic Disease Prioritization Tool</li> <li>• Discuss next steps for multisectoral, One Health engagement for prioritized zoonoses</li> </ul>

### WORKSHOP OUTCOMES

<b>OUTCOMES</b>	<ul style="list-style-type: none"> <li>• Prioritized list of at least 5 zoonotic diseases that are agreed upon by all stakeholders at the end of the workshop</li> <li>• Discussions about next steps for the prioritized zoonoses in terms of identifying areas for multisectoral engagement in developing control and prevention strategies</li> <li>• Workshop summary that includes the details of the process, the list of prioritized zoonoses, and discussions and recommendations by the participants on how to jointly address capacity building, prevention, and control of prioritized zoonotic diseases</li> <li>• Final report, approved by all ministries representing core voting members, within a few months of workshop completion</li> </ul>
-----------------	---

For more information, visit [www.cdc.gov/onehealth](http://www.cdc.gov/onehealth)

## APPENDIX 2: One Health Zoonotic Disease Prioritization Workshop Participants for Burkina Faso

Name	Institution	Title/Position
<b>WORKSHOP PARTICIPANTS</b>		
<b>Voting Members</b>		
Bachir Boïna	Ministry of Animal Resources and Fisheries	Director of Animal Health Service; Veterinarian
Joseph Savadogo	Ministry of Animal Resources and Fisheries	Director General for Veterinary Services
Adama Maïga	Ministry of Animal Resources and Fisheries	Director of Veterinary Public Health and Legislation; Veterinarian
Joseph Youma	Ministry of the Environment	Permanent Secretary of the Ministry
Mathias Ouedraogo	Ministry of the Environment	Deputy Director General of Water and Forests
Kirsi Ouedraogo	Ministry of the Environment	Provincial Directorate of the Ministry
Tanga Kiemtore	Ministry of Health	Directorate of Disease Control/Surveillance
Massata Nikiema	Ministry of Health	Directorate of Disease Control/Surveillance
Adama Sawadogo	Ministry of Health	Directorate of Disease Control/Surveillance
Dr. Bwire Kaitira	Vice President's Office—Environment	Principal Environmental Officer
Mrs. Jackline Makupa	Ministry of Health—Environmental Health	Environmental Health Officer
<b>Facilitators</b>		
Dominique Ilboudo	Ministry of Animal Resources and Fisheries	Director of Animal Health Service; Veterinarian
Yacinthe Guigma	Ministry of Animal Resources and Fisheries	Head of Office Sanitary; Veterinarian
Kevin Tiendrebeogo	Ministry of the Environment	Directorate of Wildlife and Cynegetic Resources
Georges Sorgho	Ministry of the Environment	Directorate of Wildlife and Cynegetic Resources
Jean Charlemagne Kondombo	Ministry of Health	Directorate of Surveillance
Micheline Ouedraogo	Ministry of Health	Directorate of Disease Control (Neglected tropical diseases)
Kristina Angelo	CDC Atlanta	Medical Epidemiologist
Nadia Oussayef	CDC Atlanta	Public Health Analyst
Julie Sinclair	CDC/OIE	Veterinary Epidemiologist and OIE liaison
<b>Focal Points</b>		
Bachir Boïna	Ministry of Animal Resources and Fisheries	Director of Animal Health Service; Veterinarian
Benoit Doamba*	Ministry of the Environment	Directorate of Wildlife and Cynegetic Resources
Issaka Yameogo	Epidemiological Surveillance Service, MOH	Head of Surveillance

Name	Institution	Title/Position
<b>WORKSHOP PARTICIPANTS</b>		
<b>Observers</b>		
Donatien Ntakarutimana	USAID Burkina Faso	Global Health Security Advisor
Pissang Tchangai Dademanao	FAO Burkina Faso	Country Team Leader, FAO ECTAD
Estelle Kanyala	FAO Burkina Faso	Expert Epidemiologist FAO GHSA Project
Adèle Traoré Kam	FAO Burkina Faso	National Project Coordinator FAO GHSA Project
Rebecca Greco Kone	CDC Burkina Faso	Burkina Faso CDC Country Director
Bijou Muhura	USAID Burkina Faso	Director, Health Bureau
Shana Gillette	USAID Washington	Senior Risk Mitigation Advisor
Seydou Yaro	Institute for Research in Health Sciences	Scientific Director
Justine Kankouan	Ministry of Health	Counselor
Jean Baptiste Rayaisse	Ministry of Animal Resources and Fisheries	Researcher at CIRDES
Issaka Yameogo	Ministry of Health	Medicine
Zida Pousga Célestin*	Ministry of the Environment	Forester
Andeline Simeon Sanou	CDC Burkina Faso	Senior Surveillance Advisor
Claire Young	US Embassy	Intern
Dr. Sarah Paige	USAID-Washington, USA	Senior Infectious Disease Advisor

\*Benoit Doamba was unable to attend the prioritization, and Zida Pousga Célestin stood in his place.

<b>WORKSHOP ORGANIZERS</b>		
Donatien Ntakarutimana	USAID Burkina Faso	Global Health Security Advisor
Pissang Tchangai Dademanao	FAO Burkina Faso	Country Team Leader, FAO ECTAD
Estelle Kanyala	FAO Burkina Faso	Expert Epidemiologist FAO GHSA Project
Adèle Traoré Kam	FAO Burkina Faso	National Project Coordinator FAO GHSA Project
Shana Gillette	USAID Washington	Senior Risk Mitigation Advisor
Sarah Paige	USAID Washington	Senior Infectious Disease Advisor
Kristina Angelo	CDC Atlanta	Medical Epidemiologist
Nadia Oussayef	CDC Atlanta	Public Health Analyst
Julie Sinclair	CDC/OIE	Veterinary Epidemiologist and OIE liaison
Grace Goryoka	CDC Atlanta	Health Scientist, ORISE Research Participant
Stephanie Salyer	CDC Atlanta	Veterinary Epidemiologist
Rebecca Greco Kone	CDC Burkina Faso	Burkina Faso CDC Country Director
Casey Barton Behraves	CDC Atlanta	Director, CDC One Health Office

## APPENDIX 3: Final Results of One Health Zoonotic Disease Prioritization Workshop in Burkina Faso

Zoonotic diseases considered for prioritization in Burkina Faso: Final results of prioritization and normalized weights for 41 zoonotic diseases. The top prioritized zoonotic diseases selected by the voting members representing all ministries active in zoonotic disease work are shown in bold.

#	Disease	Normalized Final Score	#	Disease	Normalized Final Score
<b>1</b>	<b>Brucellosis</b>	<b>1</b>	21	Listeriosis	0.597069597
<b>2</b>	<b>Anthrax</b>	<b>0.963369963</b>	22	Tularemia	0.58974359
3	Leptospirosis	0.934065934	23	Botulism	0.578754579
4	Bovine Tuberculosis	0.875457875	24	Zoonotic Swine Influenza	0.384615385
<b>5</b>	<b>Rabies</b>	<b>0.875457875</b>	25	Schistosomiasis	0.362637363
6	Toxoplasmosis	0.875457875	26	Shigellosis	0.326007326
7	Human African Trypanosomiasis	0.875457875	27	Escherichia coli	0.326007326
<b>8</b>	<b>Highly Pathogenic Avian Influenza</b>	<b>0.857142857</b>	28	Cysticercosis	0.326007326
9	Campylobacteriosis	0.838827839	29	Echinococcosis	0.326007326
<b>10</b>	<b>Dengue</b>	<b>0.838827839</b>	30	Lassa Fever	0.307692308
11	Leishmaniasis	0.838827839	31	Chikungunya	0.278388278
12	Lymphatic Filiriasis	0.838827839	32	Rift Valley Fever	0.194139194
13	Malaria	0.838827839	33	Buruli Ulcer	0.164835165
14	West Nile Virus	0.827838828	34	Rickettsioses/Spotted Fevers	0.164835165
15	Q Fever	0.802197802	35	Dranunculiasis	0.164835165
16	Yellow Fever	0.802197802	36	MERS-CoV	0.10989011
17	Plague	0.758241758	37	Crimean Congo Hemorrhagic Fever	0.10989011
18	Ebola	0.659340659	38	Nipah/Hendra Virus	0.102564103
19	Zika Virus	0.63003663	39	SARS	0.080586081
20	Marburg Hemorrhagic Fever	0.622710623	40	Lyme Disease	0.047619048
			41	Trichinellosis	0.047619048

## APPENDIX 4: The Numerical Weights for the Criteria Selected for Ranking Zoonotic Diseases in Burkina Faso

### 1. Gravity/Severity of the disease (criterion weight=0.35)

**Question: What is the case-fatality rate and incidence of the disease?**

**Answer:**

- Case-fatality rate >10% OR incidence >10/100,000 (2)
- Case-fatality rate <10% AND incidence <10/10,000 (0)

### 2. Presence of the disease in Burkina Faso or the sub-region (criterion weight=0.33)

**Question: Is this disease in the sub-region and/or in Burkina Faso?**

**Answer:**

- Yes, sub-region; Yes, Burkina Faso (3)
- Yes, sub-region; No, Burkina Faso (1)
- No, sub-region; Yes, Burkina Faso (2)
- No, sub-region; No, Burkina Faso (0)

### 3. Socioeconomic and environmental impact (criterion weight=0.15)

**Question: Does the disease cause long-term human disability and/or have high animal morbidity?**

**Answer:**

- Long-term human disability AND high animal morbidity (>40%) (2)
- Long-term human disability only (1)
- High animal morbidity only (>40%) (1)
- Neither long-term human disability or high animal morbidity (>40%) (0)

### 4. Control measures (criterion weight=0.13)

**Question: Is there a vaccine or a treatment for the disease (human or animal)?**

**Answer:**

- Vaccine and treatment exist (3)
- Vaccine or treatment exists (1)
- Neither a vaccine or treatment exist (0)

### 5. Bioterrorism potential (criterion weight=0.04)

- Question: Is this pathogen or toxin able to serve as a biologic agent for terrorism?

**Answer:**

- Yes (1)
- No (0)

## REFERENCES

1. Centers for Disease Control and Prevention. One Health Zoonotic Disease Prioritization Workshop. 2018; Available from: <https://www.cdc.gov/onehealth/global-activities/prioritization-workshop.html>.
2. Rist, C.L., C.S. Arriola, and C. Rubin, *Prioritizing zoonoses: a proposed one health tool for collaborative decision-making*. PLoS One, 2014. 9(10): p. e109986.
3. World Animal Health Information System. Anthrax, Burkina Faso. 2017 29 January 2018]; Available from: [http://www.oie.int/wahis\\_2/public/wahid.php/Reviewreport/Review?page\\_refer=MapFullEventReport&reportid=23634](http://www.oie.int/wahis_2/public/wahid.php/Reviewreport/Review?page_refer=MapFullEventReport&reportid=23634).
4. OIE. *Anthrax, Burkina Faso*. Available from: [http://www.oie.int/wahis\\_2/public/wahid.php/Reviewreport/Review?reportid=23666](http://www.oie.int/wahis_2/public/wahid.php/Reviewreport/Review?reportid=23666).
5. Centers for Disease Control and Prevention. Anthrax. Available from: <https://www.cdc.gov/anthrax/index.html>.
6. World Animal Health Information System. Zoonotic diseases in humans. 9 August 2017]; Available from: [http://www.oie.int/wahis\\_2/public/wahid.php/Countryinformation/Zoonoses](http://www.oie.int/wahis_2/public/wahid.php/Countryinformation/Zoonoses).
7. De Benedictis, P., et al., *Phylogenetic analysis of rabies viruses from Burkina Faso, 2007*. Zoonoses Public Health, 2010. 57(7-8): p. e42-6.
8. World Animal Health Information System. *Animal Health Situation*. 2016 9 August 2017]; Available from: [http://www.oie.int/wahis\\_2/public/wahid.php/Countryinformation/Animalsituation](http://www.oie.int/wahis_2/public/wahid.php/Countryinformation/Animalsituation).
9. Food and Agriculture Organization of the United Nations. *Sub-Saharan Africa HPAI situation update*. 11 August 2017]; Available from: [http://www.fao.org/ag/againfo/programmes/en/empres/HPAI\\_Africa/2017/situation\\_update\\_2017\\_06\\_07.html](http://www.fao.org/ag/againfo/programmes/en/empres/HPAI_Africa/2017/situation_update_2017_06_07.html).
10. World Health Organization. *Cumulative number of confirmed human cases for avian influenza*. 11 August 2017]; Available from: [http://www.who.int/influenza/human\\_animal\\_interface/2017\\_06\\_15\\_tableH5N1.pdf?ua=1](http://www.who.int/influenza/human_animal_interface/2017_06_15_tableH5N1.pdf?ua=1).
11. Ducatez, M.F., et al., *Genetic characterization of HPAI (H5N1) viruses from poultry and wild vultures, Burkina Faso*. Emerg Infect Dis, 2007. 13(4): p. 611-3.
12. World Animal Health Information System. *Highly pathogenic avian influenza, Burkina Faso*. 2015 29 January 2018]; Available from: [http://www.oie.int/wahis\\_2/public/wahid.php/Reviewreport/Review?page\\_refer=MapFullEventReport&reportid=17455](http://www.oie.int/wahis_2/public/wahid.php/Reviewreport/Review?page_refer=MapFullEventReport&reportid=17455).
13. Centers for Disease Control and Prevention. *Highly Pathogenic Avian Influenza (H5N1) virus*. 11 August 2017]; Available from: [www.cdc.gov/flu/avianflu/h5n1-virus.htm](http://www.cdc.gov/flu/avianflu/h5n1-virus.htm).
14. Ducrotoy, M., et al., *Brucellosis in Sub-Saharan Africa: Current challenges for management, diagnosis and control*. Acta Trop, 2017. 165: p. 179–193.
15. Ayayi JA, A.T., Philippe Koné, *The impact of brucellosis on the economy and public health of Africa*. 2009: OIE Conference.
16. Boussini, H., et al., *[Prevalence of tuberculosis and brucellosis in intra-urban and peri-urban dairy cattle farms in Ouagadougou, Burkina Faso]*. Rev Sci Tech, 2012. 31(3): p. 943–51.
17. Coulibaly, N.D. and K.R. Yameogo, *Prevalence and control of zoonotic diseases: collaboration between public health workers and veterinarians in Burkina Faso*. Acta Trop, 2000. 76(1): p. 53–7.

18. Centers for Disease Control and Prevention. Brucellosis. Available from: <https://www.cdc.gov/brucellosis/>.
19. World Health Organization. Dengue Fever-Burkina Faso. 2016 10 August 2017]; Available from: <http://www.who.int/csr/don/18-november-2016-dengue-burkina-faso/en/>.
20. Sanofi Pasteur. Dengvaxia, world's first dengue vaccine, approved in Mexico. 11 August 2017]; Available from: [www.sanofipasteur.com/en/articles/dengvaxia-world-s-first-dengue-vaccine-approved-in-mexico.aspx](http://www.sanofipasteur.com/en/articles/dengvaxia-world-s-first-dengue-vaccine-approved-in-mexico.aspx).
21. Centers for Disease Control and Prevention. Dengue. Available from: <https://www.cdc.gov/dengue/index.html>.
22. United States Agency for International Development. *Burkina Faso: Agriculture and Food Security*. 9 August 2017]; Available from: <https://www.usaid.gov/burkina-faso/agriculture-and-food-security>.
23. Ministère des Ressources Animales, *Annuaire des statistiques de l'élevage, 2014*. 2014.
24. Food and Agriculture Organization of the United Nations. *Country profile: Burkina Faso*. 9 August 2017]; Available from: <http://www.fao.org/ag/AGP/AGPC/doc/Counprof/BurkinaFaso/BurkinaFeng.htm>.
25. Burkina Faso, *Programme National du Secteur Rural (PNSR) 2011–2015*. 2012.
26. MRA/PNUD, *Contribution de l'élevage à l'économie et à la lutte contre la pauvreté, les déterminants de son développement*. 2011.
27. MRAH, *Plan d'actions et programme d'investissements du sous-secteur de l'élevage (PAPISE 2016–2020), Rapport provisoire*. 2017.
28. Encyclopedia Britannica, *Burkina Faso*.



Photo 9. Young man in Burkina Faso.

