Human Environment Interaction in Africa
Using National Geographic Maps in the Classroom

Michigan Geographic Alliance Teacher Consultant Stan Masters

Overview: Many of the important issues facing modern society are the consequences of human modifications of the physical environment. These consequences can be intended and unintended, positive and negative. Geography students must understand the reasons for and consequences of human modifications of the environment in different parts of the world. This activity focuses on those human-environment interactions in Africa.

Connections to the Curriculum: geography, world cultures

Connections to the Michigan Curriculum Framework
II. 3: Human Environment Interactions

Grade Level: 3-12

Time: one class period

Materials Required:
*Africa: A Storied Landscape and Africa: The Human Footprint* two-sided NGS map
Student Chart of Human Environment Interaction

Objective: Students will describe the human-environment interaction of cultures of Africa and explain the consequences of the interactions.

Procedures: Explain to students that there is a special relationship between humans and their environment. This relationship is viewed in three ways:

Humans *depend* on the environment for their basic needs of food, shelter, and clothing.
Humans *adapt* to survive the environment’s climate, topography, and natural hazards.
Humans *modify* the environment to meet their changing needs using technology.

Explain to the students that the relationship between humans and the environment has both positive and negative consequences. When successful, the relationship between people and the physical environment is adaptive; when unsuccessful, the relationship is largely based upon modifications by humans.

Have the students investigate the relationship between the people of Africa and their environment. Give each student the Chart of Human Environment Interaction. Divide the students into groups of three. Give each group of students a map. Using the examples from the map, have the students share the responsibility of describing the examples of depending on, adapting to, and modifying the environment. The students will record their descriptions on the chart.

Assessment: Have students identify a positive and a negative consequence of the human-environment interactions. This may include: pollution, resource depletion, land degradation, desertification, deforestation, salinization, smog, and plant and animal species relocation. Students can compare their answers to the possible consequences by reviewing the map or sharing with classmates.
### Teacher Answers of Student Chart of Human Environment Interaction

**Africa: A Storied Landscape**

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<thead>
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<tbody>
<tr>
<td>“Making Every Inch Count”</td>
<td>People in Rwanda depend on the land for big harvest of food.</td>
<td>People in Rwanda adapt to their land by planting crops on steep slopes.</td>
<td>People in Rwanda modify their land by building terraces on hills for their crops.</td>
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<tr>
<td>“West Zambezi Floodplain”</td>
<td>The people of the West Zambezi Floodplain depend on their land for food.</td>
<td>The people of the West Zambezi Floodplain adapt and moving livestock during floods.</td>
<td>The people of the West Zambezi Floodplain modify their land by building their villages on high mounds</td>
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<tr>
<td>“When People Create Forest”</td>
<td>The people of West Africa depend on trees for their homes and food.</td>
<td>The people of West Africa adapt to their land by producing firebreaks during savanna fires.</td>
<td>The people of West Africa modify their land by planting oil palms and mangoes.</td>
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<tr>
<td>“Farming Success”</td>
<td>The people of Nigeria depend on the land for food.</td>
<td>The people of Nigeria adapt to the land by feeding their livestock weeds and using manure for fertilizer.</td>
<td>The people of Nigeria modify their land by using ox-drawn plows to turn soil.</td>
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<tr>
<td>“Atlas Mountains”</td>
<td>The people of the Atlas Mountains depend on springs for water.</td>
<td>The people of the Atlas Mountains adapt to the land by having towns tap the springs for pure water.</td>
<td>The people of the Atlas Mountains modify their land by diverting springs for irrigation for their farms.</td>
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### Teacher Answers of Student Chart of Human Environment Interaction

**Africa: The Human Footprint**

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<td>“River as Lifeline”</td>
<td>The people depend on the Nile River for water.</td>
<td>Many people have adapted to the Nile by living in the delta region.</td>
<td>The people have modified the Nile River through increased irrigation and curtailing the flooding.</td>
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<td>“Deforestation”</td>
<td>The people of Ethiopia depend on the land for food.</td>
<td>The people adapt to the land by living on farms.</td>
<td>The people of Ethiopia modify the land by clearing the land through fires.</td>
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<tr>
<td><strong>“Land Redistribution”</strong></td>
<td>The people of Zambia depend on the land for food.</td>
<td>The farmers of Zambia adapt to the land by growing crops.</td>
<td>The government of Zambia is modifying the land by redistributing the arable land to farmers from Zimbabwe.</td>
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</tr>
<tr>
<td>“Squeezing the Heart”</td>
<td>People in the Congo Basin depend on the forests for food, water, shelter and fuel.</td>
<td>The loggers and miners in adapt to the Congo Basin forests by moving their operations deeper into the trees.</td>
<td>The loggers and miners in modify the Congo Basin by building roads for hunters and farmers to use.</td>
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<tr>
<td>“The Desert’s Edge”</td>
<td>The people of the Sahel depend on the land for food for their livestock.</td>
<td>The people of the Sahel adapt to the environment by moving their herds to find food in this semiarid region.</td>
<td>The people of the Sahel modify the land by moving their huge livestock herds south to farm settlements and cities.</td>
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Overview: From afar, Africa may seem majestically empty: the tremendous Sahara, the deep forest, the unbroken plains. A closer look reveals a continent where nearly a billion people and untold numbers of animals coexist on a complex sweep of earth. The NGS map, *Africa: A Storied Landscape* contains a plethora of information, both about the physical characteristics of Africa, and the human/environment interaction of its people with the land. Students will become familiar with this interesting continent using the map and the following activities.

Grade Level: 6-12

Connections to Michigan Content Standards:
II.2.MS.4: Explain how humans modify the environment and describe some of the possible consequences.
II.2.MS.5: Describe the consequences of human/environment interactions in several different types of environments.

Time: 1 class period

Materials required: NGS Map: *Africa: A Storied Landscape*; Student worksheets, I Have, Who Has strips (included)

Objectives: TLW
- Locate facts and information from the map.
- Describe at least 3 ways inhabitants of Africa have changed, adapted to, and depend on the environment.

Procedures:

1. Ask students to locate the following text pieces on the map and read together:
   - A Storied Landscape
   - How the Land Unfolds
2. Use the information in the text to answer the first 3 questions on the worksheet. Other text pieces on the map contain information about specific places and human modifications, adaptations, and dependence on the varied physical and human environments in Africa. Students, working in groups, should read and answer the rest of the questions on the worksheet.
3. For further review, use the “I Have, Who Has” strips included. Cut apart and distribute; start with any one and continue until the first person’s answer is given.
A CLOZE reading activity

1. The African continent stretches__________ kilometers from north to south.

2. Africa contains_____ countries on the mainland and offshore.

3. Currently the population in Africa is _____ million people.

4. The _________ Mountains, stretching ________ kilometers, are the longest mountain range on the continent.

5. The world’s second largest rain forest, the _______ _____________ is found in Central Africa.

6. Sand, bedrock and stone cover _____ of Africa with land that is scarcely habitable.

7. Farmers plant on steep slopes, ________________ hills, to feed the people of ______________, one of Africa’s most densely settled mainland nations.

8. No longer needing to focus primarily on political conflict, the people in Angola have turned attention to _______________ ________________.

9. Wildebeests and other _______________ migrate toward new growth when Africa’s grasslands turn green. **using your own words, write a definition of the term you used in the blank:

10. An off-shore nation, ______________, as a textile exporter has the highest per capita GDP (Gross Domestic Product) in Africa. This is equal to _____________.

11. Cacao plantations, found in __________, now surround small patches of protected but heavily poached rainforest.

12. In Egypt, the government is pumping water from _______ _____________ to form new lakes, which will irrigate farmland in the desert.

13. The Delta of the ____________ River holds sub-Saharan Africa’s largest oil deposits.
14. Colonial-era policies confined black farmers to designated homelands in ________ ________.

15. The government of _______________ hopes to boost the number of visitors while protecting the land. Many of these tourists come to view the wildlife of the _______________ and _______________, Africa’s highest peak.

16. South along the Congo River lie sparsely populated grasslands, rooted in ancient ________ formed by sand blown from the ______________ Desert.

17. South of the ____________, woodlands become grasslands as people cut trees for fuel faster than they can grow.

18. Trees are thinning in much of ________ _______________, but humans also preserve and create forests. People plant trees like ______ ________ and ______________.

19. ___________ and ___________ once cooperated across the Sahel but competition for land, especially in Sudan, has created a complex political crisis.

20. ________________, home to thousands of endemic species, is the world’s _____ largest island.

21. In Kano, Nigeria, farmers, using _________________ plows to effectively turn soil, grow enough food to feed an increasingly dense population.

22. A band stretching from ________________ to ___________ then south to _____________ supports the most intensive agriculture and some of the densest populations in Africa’s history.

23. The _______________ ________________, with floods, sandy soils, and flies carrying disease, make this a hard place to live.

24. From Ethiopia to Mozambique, the fault holds ________ of the world’s ten largest lakes.

25. Some _____ percent of Ethiopians live in fertile ________________, a refuge from malaria.

26. Human pack areas of ample ________ and rich ________ where farmers can raise the most food: Nigeria, Ethiopia and countries bordering the lakes of the Great Rift Valley.

27. Amid fears that ___________ ________________ may further cut rainfall, scientists are developing corn that needs less water.
Give at least one example of people in Africa:

Depending on the environment: ________________________________________

Adapting to the environment: __________________________________________

Modifying the environment: ____________________________________________

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A CLOZE reading activity  Africa: A Storied Landscape  Answer Sheet

In parentheses, following the complete statement is the name of the map section where students will be able to obtain the information for each statement.

1. The African continent stretches (8,000) kilometers from north to south. (A Storied Landscape)
2. Africa contains (53) countries on the mainland and offshore. (How the Land Unfolds)
3. Currently the population in Africa is (900) million people. (A Storied Landscape)
4. The (Atlas) Mountains, stretching (2,400) kilometers, are the longest mountain range on the continent. (Atlas Mountains)
5. The world’s second largest rain forest, the (Congo Basin) is found in Central Africa. (Africa’s Green Heart)
6. Sand, bedrock and stone cover (one-third) of Africa with land that is scarcely habitable. (Desert Expanse)
7. Farmers plant on steep slopes, (terraced) hills, to feed the people of (Rwanda), one of Africa’s most densely settled mainland nations. (Making Every Inch Count)
8. No longer needing to focus primarily on political conflict, the people in Angola have turned attention to (wildlife conservation). (Angola Reborn)
9. Wildebeests and other (ungulates) migrate toward new growth when Africa’s grasslands turn green. (Grasslands) **using your own words, write a definition of the term you used in the blank:
10. An off-shore nation, (Mauritius), as a textile exporter has the highest per capita GDP (Gross Domestic Product) in Africa. This is equal to ($12,800). (Worlds Apart)
11. Cacao plantations, found in (Ghana), now surround small patches of protected but heavily poached rainforest. (Dense Forests)
12. In Egypt, the government is pumping water from (Lake Nasser) to form new lakes, which will irrigate farmland in the desert. (World’s Largest Desert)
13. The Delta of the (Niger) River holds sub-Saharan Africa’s largest oil deposits. (Nigeria’s Oil Country)
14. Colonial-era policies confined black farmers to designated homelands in (South Africa).  
(Places of Promise)
15. The government of (Tanzania) hopes to boost the number of visitors while protecting the land. Many of these tourists come to view the wildlife of the (Serengeti) and (Kilimanjaro), Africa’s highest peak. (Spectacle of the Serengeti)
16. South along the Congo River lie sparsely populated grasslands, rooted in ancient (dunes) formed by sand blown from the (Kalahari) Desert. (World’s Largest Swamp Forest)
17. South of the (Sahel), woodlands become grasslands as people cut trees for fuel faster than they can grow. (Woodlands and Shrublands)
18. Trees are thinning in much of (West Africa), but humans also preserve and create forests. People plant trees like (oil palms) and (mangoes). (Where People Create Forest)
19. (Herders) and (farmers) once cooperated across the Sahel but competition for land, especially in Sudan, has created a complex political crisis. (Western Sudan)
20. (Madagascar), home to thousands of endemic species, is the world’s (fourth) largest island. (Saving Madagascar)
21. In Kano, Nigeria, farmers, using (ox-drawn) plows to effectively turn soil, grow enough food to feed an increasingly dense population. (Farming Success)
22. A band stretching from (Senegal) to (Ethiopia) then south to (Johanesburg) supports the most intensive agriculture and some of the densest populations in Africa’s history. (Breadbaskets)
23. The (West Zambezi Floodplain) with floods, sandy soils, and flies carrying disease make this a hard place to live. (West Zambezi Floodplain)
24. From Ethiopia to Mozambique, the fault holds (three) of the world’s ten largest lakes. (Great Rift Valley)
25. Some (85) percent of Ethiopians live in fertile (highlands), a refuge from malaria. (Mountains of Ethiopia)
26. Human pack areas of ample (rain) and rich (soil) where farmers can raise the most food: Nigeria, Ethiopia and countries bordering the lakes of the Great Rift Valley. (Crowded Spaces)
27. Amid fears that (global warming) may further cut rainfall, scientists are developing corn that needs less water. (Drying Up?)

Give at least one example of people in Africa: (Sample answers)

Depending on the environment: Nigeria’s old deposits; Tourism in Tanzania; Cutting trees for fuel in the Sahel
Adapting to the environment: Preserving and creating forests in West Africa; Using ox-drawn plows in Nigeria; Living in fertile highlands in Ethiopia to avoid malaria; Developing corn that needs less water.
Modifying the environment: Terraced farming on the hills of Rwanda; Pumping water from Lake Nasser for irrigating the desert in Egypt; Crowding into Nigeria, Ethiopia and other countries bordering the lakes of the Great Rift Valley.
Africa: I Have, Who Has

Copy and cut the following into strips and give one to each student or group of students. Have one student read a question and other students use the NGS Map, *Africa, A Storied Landscape*, to find the answer. Whoever has the strip with the answer then reads his question. Any question can be used first, and the activity ends when the first student to ask a question answers.

I have the **HIGHLANDS**
Who has the number of kilometers the continent of Africa stretches from north to south?

I have **8000**
Who has how many countries in Africa on the mainland and offshore?

I have **53**
Who has how many people currently populate Africa?

I have **900 MILLION**
Who has the longest mountain range on the continent, and how many kilometers they stretch?

I have **ATLAS MOUNTAINS, 2400 KM**
Who has the name of the world’s second largest rainforest, located in Central Africa?

I have the **CONGO BASIN**
Who has how much of Africa is covered with sand, bedrock, and stone, making the land scarcely habitable?

I have **ONE-THIRD**
Who has one of Africa’s most densely settled mainland nations, where farmers plant on terraced hills?

I have **RWANDA**
Who has what the people of Angola have turned their attention to, now that political conflict is no longer needing their focus?
I have **WILDLIFE CONSERVATION**
Who has an offshore nation that is a textile exporter with the highest GDP (Gross Domestic Product) in Africa?

I have **MAURITIUS**
Who has the country where cacao plantations now surround small patches of protected but heavily poached rainforest?

I have **GHANA**
Who has the lake in Egypt that the government is pumping water from to form new lakes, which will irrigate farmland in the desert?

I have **LAKE NASSER**
Who has the river whose delta holds sub-Saharan Africa’s largest oil deposits?

I have **THE NIGER**
Who has the country where colonial-era policies confine black farmers to designated homelands?

I have **SOUTH AFRICA**
Who has the country whose government hopes to boost the number of visitors to the Serengeti and Kilimanjaro, while protecting the land?

I have **TANZANIA**
Who has the kind of ancient land formation that is home to sparsely populated grasslands located south along the Congo River?

I have **DUNES**
Who has the desert whose sand has created this formation?
I have **KALAHARI**
   Who has the woodlands that are becoming grasslands as people cut trees for fuel, faster than they can grow?

I have **SAHEL**
   Who has the world’s fourth largest island home to thousands of endemic species?

I have **MADAGASCAR**
   Who has the type of plow farmers use to effectively turn soil, and grow enough food to feed an increasingly dense population in Kano, Nigeria?

I have **OX-DRAWN PLOWS**
   Who has the place where floods, sandy soils, and flies carrying disease make it hard to live?

I have **THE WEST ZAMBEZI FLOODPLAIN**
   Who has the fault that holds three of the world’s ten largest lakes in Ethiopia to Mozambique?

I have **THE GREAT RIFT VALLEY**
   Who has the fertile area that is a refuge from malaria, where 85% of Ethiopians live?
How the Land Unfolds: Unfolding the African Landscape
Using National Geographic maps in the classroom

Michigan Geographic Alliance Teacher Consultants:
Cathie Gronda
Kristi Karis
Al Lewandowski
Marsha A. Lewis

Overview: From the first cautious steps in the Great Rift Valley, humans have adapted to the challenges of Africa. Today it lies divided into more nations than any other continent—47 on the mainland and 6 offshore. But as shown by the satellite-derived map, landscapes that ignore national borders from a mosaic of ecosystems that subtly blend one into the other—from the temperate Mediterranean through deserts and scattered croplands to forests, swamp, and savanna—each with its own rules for life. A vertical strip of the continent, from central Egypt to South Africa’s coast (below), is a key to explore Africa’s varied face.

Grade Level: 6-12

Connections to Michigan Content Standards:
II.2.MS.2 Locate major ecosystems, describe their characteristics, and explain the process that created them.
II.2.MS.5: Describe the consequences of human/environment interactions in several different environments.

Time: 1-2 class periods

Materials Required: NGS Map: Africa: A Storied Landscape

Objectives: TLW
- Locate and describe the physical regions of Africa
- Describe the relative location of the physical and human regions of Africa
- Compare the degree of human impact and the physical characteristics of the region.

Procedures:

1. Find a Pattern:
- Unfold the map of Africa and study Africa: A Storied Landscape.
- Can you identify a pattern in the distribution of the colors on the map

[Starting from the North, the colors follow the pattern changing from tan/light green/dark green/light green/tan]
(Region)
2. Explore the Key
[Teacher Instruction: Before beginning this activity, select six volunteers to each prepare to read one of the text boxes included in the key. The goal is to introduce learners’ to the notion of reading with fluidity. ]

- Look at the eastern edge of the map sheet.
- Find the continental cross section key
- Ask volunteers to read each of the text boxes
- Working in teams of two or three, ask each team to carefully cut the cross section key from the map, being certain to include the descriptive text boxes.

3. Apply the Key
Using the map folds as a guide, align the key along the center of the continent from north to south.

Region
- With the key aligned, apply the appropriate name to each colored region.

[tan = desert expanse; Lt. Green = Bread basket; Dk. Green= Dense forests; Lt. green= woodlands and shrublands; tan=grasslands; orange/red = crowded places.]

Location
- How would you describe the relative location of each of these regions?

[For Example: Desert expanse is the northernmost region; Breadbasket region is north of the equator or south of the desert]

Place; Human/Environmental Interaction
- How would you describe the relative location of one or more of the Crowded Places?
[For Example: Located along coastal regions, rivers, elevation]

Place
- Name a place in each of the regions you would like to visit. Say why you would choose this place.

[Accept all reasonable responses, but emphasize the geographic notion of place as having natural and cultural characteristics.]

Movement
- Locate a river in each of the major regions you are now able to identify. Using your finger, trace the river from its source or headwaters to its mouth. What direction does the river flow? What places or locations can you identify along the river course?

[Accept all reasonable responses, while emphasizing the correct direction of flow.]
Unfolding Africa: The Human Footprint

- Reverse the map and look at Africa: The Human Footprint.
- Locate the *Mapping the Impact* key found at the eastern edge of the map.

[Repeat the reading fluidity activity described above]

- Using the map folds as a guide, align the key along the center of the continent from north to south.
- Beginning with the Desert Expanse region, interpret the possible relationship between the degree of human impact and the physical characteristics of the region.

[For example: Desert Expanse; least human influence is related to harsh desert environment, lack of water, etc. Bread basket; Most human influence is related to fertile soils, adequate rainfall, accessibility, etc. Note: Direct learners to identify least influenced regions surrounded by most influenced regions. For example, note Central African Republic and Democratic Republic of the Congo. How can these anomalies be explained? (War, inaccessibility, deforestation etc.)]