Addressing threats to biodiversity: the risks and rewards of diversifying agricultural practices in Guinea-Bissau

Rachel Langkau
Abstract

- The purpose of this study is to explore the ongoing threats to biodiversity in Guinea-Bissau; specifically, the environmental, economic, and cultural costs associated with the loss of a native species such as African rice, as well as the loss of its future potential. The next step in this project will be to work alongside host country nationals to develop a curriculum geared toward addressing these pressing environmental issues in Guinea-Bissau.
Biodiversity in Guinea-Bissau

- The economy of Guinea-Bissau relies heavily on agriculture along with some fishing and forestry.
- Primary crops include cashews, coconuts, palm oil, and rice.

Pressing Threats:
- Soil erosion
- Fire
- Drought
- Acidification/salinization
Rice is a major staple crop in Guinea-Bissau. “Rice is the main staple of Guinea-Bissau, to the extent that farmers speak of “hunger” when they face rice shortages, even if there are plenty of other food alternatives available” (Temudo, 2011).

There are two cultivated species: Oryza Sativa (Asian rice) and Oryza glabberima (African rice).

Slight morphological differences separate the two species of rice, making them difficult to tell apart in the field.

Oryza glaberrima was first domesticated and grown in West Africa and is a part of many local traditions.

“Some West African farmers, including the Jola of southern Senegal, still grow African rice for use in ritual contexts” (Linares, 2002).
**African Rice**

- **Oryza Glaberrima**
  - Tall rice plant (typically under 120 cm but some floating varieties grow up to 5 meters)
  - Small pear-shaped grain, reddish bran and green to black hulls
  - Straight, simply branched panicles and short round ligules
  - Drought and deep water resistant
  - More tolerant to human neglect
  - Profuse vegetative growth, out competing weeds
  - More resistant to pests disease (greater resistance to biotic and abiotic stresses)
  - Generally red skinned – cannot be mixed with conventional rice in bulk handling

**Disadvantages:**
- Most African rice shatters more than Asian rice; on average about half the grains are lost
- Greater height and weaker stems makes it more prone to lodge
- More brittle grains compared to Asian rice
**Oryza sativa**

- Typically grow in a tuft of upright culms (stems)
- Up to 2m tall or more, long, flat leaf blades
- Environmental tolerance/seasonality
- Categorized generally as either Valley rice, Upland, Spring rice, or Summer rice
- Generally grown in fields that are flooded for part of the growing season
- Variety of colors

**Advantages:**
- Generally higher yield
- Less brittle - easier to mill
- Industrial and shipping preference
- Economically advantageous
Rice Agriculture

- Issues:
  - At the present time, Oryza glaberrima is being outcompeted everywhere and replaced by the species introdiced into the continent during the 16th century by the Portuguese as early as the 16th century (Linares, 2002).
  - Even though the major classes of the country’s land cover are mangroves and land for over 9 percent of the country’s land, the rice production is still importing 822.9 million of rice.
Addressing the Issues

- Understanding the cultural value and preference
  “An understanding of farmers’ criteria for variety selection is key to promoting effective plant breeding and achieving broader aims of food security and food sovereignty (Temudo, 2011).”
- Educating people about the importance of biodiversity
- Influencing policy
Established Goals

- Outline Bio-diversity; what it is; who it affects; how it affects us
- Educate students about the importance of Bio-diversity
- Address the underlying cultural and economic aspects of biodiversity
- Students will be able to recognize the cultural and economic consequences associated with the loss of native species
- Students will be able to identify specific threats to biodiversity in their environment
- Students will then be able to strategize how to address these threats with supporting evidence
• Students will understand how they can foster biodiversity in their environment

• Students will recognize and understand the significance of establishing healthy biodiversity
References

- https://borgenproject.org/guinea-bissau/
Image References

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