Black Rice

Week 11
Lecture 01
An African Contribution to American Agriculture

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This week’s lecture is based primarily on the reading for the week:


Additional information was gathered from the sources shown on the next three slides
Black Rice: Additional Sources


Black Rice: Additional Sources

Black Rice: Additional Sources


Black Rice: Additional Sources

A few additional sources are given on the slide where the information appears.
Black Rice:

The learning objectives for week 11 part 01 are:

– to understand the latest discovery of African contributions to America: African rice and rice production practices
– to appreciate the significance of African rice production skills in facilitating economic growth in colonial America
– to understand the main facts about the slave trade as they help to understand African contributions to the Americas
Black Rice

Terms you should know for week 11 part 01 are:

– Carolina Rice
– Middle passage
– Hanging dike
Rice

- The single most important food grain in the world
- Providing half the calories to one-third of the world’s people in 2002

Advantages of Rice

- Can grow on almost any type of soil
- Is one of the most nutritious foods with
  - carbohydrates
  - iron
  - vitamin B
  - 7% protein (8% for brown rice)
  - niacin
Advantages of Rice

In the make-up of its protein content, rice is even more valuable than the percent figure suggests. Using the hen’s egg as a protein score of 100 means that the protein contains the amino acids the human body cannot synthesize in almost exactly the correct proportions.
Advantages of Rice

Potatoes have a protein score of 34, beans 44, corn 49, wheat 62, and soybeans 67. Rice has a score of 69, with a near perfect proportion of leucine and good proportions of tryptophan and valine.

How Rice Grows

- Cell structure of the roots has wide canals, which allow the plant to take in oxygen and nutrients from water.
- Thus, flooding of the young plants can greatly increase the output of rice.
- “The capacity of most [flooded] terraces to respond to loving care is amazing.”

How Rice Grows

- Seeds grow from the top of the shaft, unlike wheat and corn that grow from the side.
- At harvest, each plant has 5 or more ribs radiating out in a fan shape.

How Rice Grows

- The thin tropical soils are compensated for by the nutrients brought in by the irrigation water.
- Blue-green algae in the warm water help the rice plants fix nitrogen.
- The gentle movement of the water in the paddy field aerates the rice plants.
Growing Rice: The 7 Steps

- Clearing, Repairing Terraces and Dikes
- Plowing: turning the soil
- Smoothing and flooding: “The soil is pulverized and soaked until it becomes a mire of heavy mud.” (Robbins Burling)
- Planting then Transplanting
- Weeding, Fertilizing, Pesticides
- Draining
- Harvesting

Repairing the Dikes

can be back-breaking work as this Javanese rice farmer shows.
Repairing the Dikes

often continues through the flooding and even planting periods, creating the hard work that this Indian farm laborer needs to survive.
Asian Rice Terraces

In parts of China, India, Japan, Vietnam, the Philippines, as on this Javanese hillside
Asian Rice Terraces

farmers making dikes have also carved out spectacular terraces to limit erosion, make the slopes flat, and bring additional land under cultivation.

Outsiders have marveled at the skill of the farmers and the beauty of the fields.
Asian Rice Terraces

The Southeast Asian terraces in the previous slide show why.
Plowing can also be heavy labor as shown by this Indian farmer as he prepares the soil for the first rains with the help of two oxen.
Smoothing and Flooding is the heaviest work, even with the help of the stalwart Javanese water buffaloes.
Smoothing and Flooding

These Indian farmers work together to prepare the field for the young rice plants that will be inserted into the mud by women laborers.
Forty Days after Planting

The seedlings are pulled up and transplanted at precisely 25 centimeters intervals to give the best root growth.
Transplanting

Today this is known as the “Japanese Method,” and is practiced throughout Asia.
Transplanting… is done throughout Asia by women and is some of the hardest labor, requiring bending over for hours to shove the seedlings into the mud. Just taking a step backwards is hard work in the thick goo of the padi field.
Harvesting takes place about 90 days after transplanting and requires the backbreaking work of women throughout Asia.
Harvesting

Like the woman in the previous slide, these Indian farm laborers cut the rice plants one by one to maximize output per unit of land.
Is Followed by Binding

up the rice in bundles to carry to the landowner’s house where the (in this case) Javanese landlord’s rice will be dried and threshed.
Carrying can also be a formidable task, at least in this Indian village.
Preparing Rice

After harvest, the rice must be

- Dried
- Threshed, to remove the grains from the stalks,
- Pounded, to break the husk off the grain
- Winnowed, to separate the chaff from the grain
Threshing can be done as hand pounding or with the feet, rolling the rice seeds back and forth under the weight of one’s body.
Preparing Rice

- Some cultures cook the rice once while still in the husk.
- This is called “parboiling.”
Preparing Rice

Parboiling increases the nutritional value of rice because some of the vitamins in the seed coat penetrate into the kernel. The losses from polishing are reduced. Parboiling also makes the seeds less brittle so fewer of them crack during milling.

Preparing Rice

- Rice can be eaten with some of the inner husk left (brown rice), or
- Rice can be polished to a pure white.
There Are Many Types of Rice with Many Flavors and Textures

Thousands of varieties worldwide

- Jasmine
- Basmati
- Brown
- Red
- Sticky Sweet, etc.
Eating Rice

The classic Western vision of rice is the Chinese rice bowl, awaiting the chopsticks.
Eating Rice

Rice is the central food around which Chinese meals are constructed.
Eating Rice

In South India rice is steamed with coconut and sugar to make a popular breakfast.
Eating Rice

Another breakfast item is rice cakes with a spicy vegetable sauce called “sambar.”
Origins of Rice

Rice farming probably originated in China, perhaps over 4,000 years ago. In a study of Asian agriculture published in 1911, Franklin Hiram King called the Chinese people the “farmers of 40 centuries.”

Origins of Rice

For centuries, Western scientists and observers have assumed the Chinese and other Asian varieties were the only source for all the world’s domesticated rice.
Origins of Rice

The Asian rice is known as *Oryza sativa*, and was long considered the species from which all modern rice varieties descended.
New Evidence on Rice

In 2001, Judith Carney’s book brought together evidence showing that an African rice variety was independently domesticated hundreds of years ago.
African Rice

In the 19th Century French botanists working in West Africa began describing a kind of rice that differed significantly from Oryza sativa.

In 1914, French botanist August Chevalier formally advanced the hypothesis of an indigenous African rice.
African Rice

By the 1970s scientists had reached agreement on the existence of African rice, now named *Oryza glaberrima*, (smooth husk rice), the term suggested by German botanist Ernst Steudel in 1855 while examining some of the French samples.

African Rice

Thus, it now appears that of the 20 species of rice that grow wild on earth, two were domesticated:

Oryza sativa in Asia 7,000 years ago, and Oryza glaberrima in West Africa, date unknown
Karen Hess (1992:13) cites research indicating that African domesticated rice has been cultivated since at least 1,500 BCE.
What’s the Importance?

Our knowledge of a separate African domestication of rice helps solve many historical problems, such as why many African peoples use European words for rice, but others such as the Mandinka and Wolof have original words of non-European origin.
What’s the Importance?

It also helps explain why some Arab and Italian travelers to Africa mentioned the presence of large amounts of rice in Jenne, Gao, and Timbuktu in the great inland Niger River Delta region many years before the Portuguese brought *Oryza sativa* from Asia in the late 15th Century.

Source: Carney, page 43
What’s the Importance?

But the greatest importance of this finding is that we now have strong reasons to believe that African slaves brought the knowledge and skills from their African homeland to create the first great commercial crop of the New World: Carolina Rice.
Many people are familiar with Carolina brand rice. Fewer realize that rice from Georgia and South Carolina was a major crop that sold in the markets of Europe from as early as 1690.
Rice in North America

The association of Black people with white rice in the supermarket results from a Texas company’s marketing strategy many years ago.
Rice in North America

An African-American rice farmer in Texas named “Ben” gained a regional reputation for his skill and the high quality of his rice.
What’s the Importance?

For centuries European and North American observers have presumed that Carolina rice was *Oryza sativa*, brought from Asia by Portuguese traders, and grown under the supervision of brilliant white managers who instantly designed irrigation and planting techniques that adapted Asian rice to the special conditions of Georgia and South Carolina.
What’s the Importance?

But Judith Carney’s careful and innovative historical research suggests that it was slaves from the rice-producing areas of West Africa who created the sophisticated irrigation and drainage systems found in Georgia and South Carolina.
What’s the Importance?

These systems resemble those found in West Africa in remarkable detail and do not look like the Asian irrigation works.
What’s the Importance?

The Europeans of the time had no knowledge of irrigated rice agriculture. And—their planting and water management techniques differed significantly from those of their African slaves.
What’s the Importance?

Instead, we should look to the traditional knowledge of West African rice farmers for the basis of Carolina rice.

They were the only expert farmers present at the creation of the sluices, canals, drainage works, plugs, and other devices used in North American rice farming in the period from the 1690s to 1776 when Carolina rice became a major export crop to Europe.
African Rice Origins

African peoples developed three different systems for growing *Oryza glaberrima*.
African Rice Origins

1. Highland
2. Freshwater Floodplain
3. Mangrove
African Rice Origins

Each system was fine-tuned to specific environmental conditions.
Highland Rice in America

In the mid 1700s Thomas Jefferson attempted dry upland rice production in Virginia. He used slave labor, but we do not know if the slaves came from the rice producing areas of West Africa. The project failed commercially.
Let us consider for a few moments the basic facts about the slave trade.
Slave Trade Basics: Updated 2011

Thanks to the Trans-Atlantic Slave Trade Data Base recently created and online free at:

http://slavevoyages.org/
We now have detailed facts about what actually happened during the slave trade.
Slave Trade Basics: Updated 2011

- From 1514 to 1866 35,000 slave ship voyages carried 12.5 million people from Africa to the New World as slaves.

- Around 10.7 million arrived alive; the other 1.8 million died on the way, on what African Americans call the “Middle Passage.”

- By 1850, one-third of all Africans were living outside Africa as slaves.
Slave Trade Basics

The slaves were brought to –

- North America 7% (USA 5%)
- The Caribbean 42%
- South America 49%
Slave Trade Basics

From 1701 to 1810, a period for which we have good shipping records, 59% came from the West African regions of Senegambia, Sierra Leone, and Ghana.
Slave Trade Basics

Judith Carney presents convincing historical documentary evidence to show that the plantation owners in the rice growing regions of Georgia and South Carolina actively sought to purchase slaves from these West African areas, knowing they had rice growing knowledge and skills.
Karen Hess (1992:13) cites a Charleston newspaper advertisement in 1785 that described “a choice cargo of windward and gold coast negroes, who have been accustomed to the planting of rice.”

Hess (1992:14–15) further cites studies showing that South Carolina slaves used seed planting methods identical to those in Africa where they pushed a hole with their heel as they walked along, then covered the seed by pushing down with their foot.

Hoeing in unison to work songs was another African procedure used in rice planting that was not imposed by the European planters.

Slave Trade Basics

West Africans were also desirable because of their resistance to malaria, something the white owners recognized but could not explain. Today we know that the presence of sickle cell in their blood and certain foods in their diet gave them substantial immunity from the disease.
Slave Trade Basics

The US Congress outlawed the slave trade in 1808, but slavery as an institution had already been enshrined in the US Constitution. Slave trading continued in the New World until about 1870.
Slave Trade Basics

US slaveholders dealt with the abolition of the overseas slave trade by creating slave breeding “farms” so that an internal slave market and slave trade developed.
Thousands of slaves went from breeding farms in Kentucky to Mississippi or Alabama.

Up to 16% of all Kentucky slaves were “sold down the [Ohio and Mississippi] river” (which is where that saying comes from).
The white and black characters who ride down the Mississippi together on a raft in Mark Twain’s 1884 novel *Adventures of Huckleberry Finn* capture some of the drama because this fact was known to readers in his lifetime.
Slavery was abolished legally in the US in 1865 by the 13th Amendment to the Constitution. Some of the drama surrounding the Amendment is shown in the 2012 feature film “Lincoln.”
Floodplain and Coastal Rice

During the slave era in Georgia and South Carolina, floodplain and coastal rice plantations arose.
African Rice Systems

West African rice farmers were experts at the technical aspects of inland and tidal rice growing.
European slave owners knew nothing about wet rice agriculture or irrigation systems yet they developed highly profitable rice plantations in Georgia and South Carolina in the 17th and 18th centuries.
Floodplain and Coastal Rice in America

African rice farming connects with the earliest New World systems through the techniques of managing water flow and keeping fresh water safe from salt water intrusions.
African Rice in America

On the Cooper River Plantation in South Carolina we find evidence of West African inland and tidal systems that differ from the Asian designs.

Figure 3.2 Inland and tidal river system, western branch of the Cooper River, South Carolina
African Rice in America

This plantation has some of the oldest rice growing dike and canal works known in the New World, perhaps dating from 1690 or before. This was one of the most profitable and successful of the Carolina Rice centers.
African Rice in America

Among the many African-based contributions to Carolina rice production was the “hanging dike,” shown in the next slide.
African Rice in America

Figure 3.4 Sketch of a hanging trunk
African Rice in America

The hanging dike facilitated the entry of the layer of fresh water that runs along the top of the salt water in tidal marshes. The salty water is mostly kept out by this device. Knowledge of this particular hydraulic engineering technique was available to West African rice farmers.
The hanging dike also facilitated control over the amount of water fed to the rice plants at different stages of the growing season and helped in bringing nutrients to the seedlings.
African Rice in America

On the Boone Plantation in South Carolina we see modern remains of a similar irrigation layout.
African Rice in America

Rice, followed in some areas by tobacco and then cotton, led to the great Southern fortunes and the construction of Greek style mansions.
African Rice in America

On the Boone Plantation in South Carolina, tourists view the splendid accumulations of classic art and furniture of the former slave-owning Southern families.
African Rice in America

Quarters for the slaves who created the wealth were less lavish.
Oryza glaberrima in America?

Judith Carney presents historical evidence that the earliest slaves in the New World grew African rice, *Oryza glaberrima*, on their household plots.
Oryza glaberrima in America?

The European slave owners quickly realized that the hydrological and agricultural skills of the African rice growers could help them make big profits by growing rice in America and selling it to Europe.
Oryza glaberrima, the West African rice variety, would have been the first to grow in the Carolina inland swamps and tidal areas.

Oryza glaberrima in America?
Oryza glaberrima in America?

But the Asian variety, Oryza sativa, gave higher output and would have quickly replaced the African rice in a commercial environment.
So the African Oryza glaberrima would have been driven out of New World rice production even though the agricultural techniques applied to Oryza sativa had originated with the African variety.
The Spread of Oryza sativa

In Africa, too, plantation and commercial agriculture led colonial governments to promote Oryza sativa over glaberrima in hopes of gaining quick profits through higher outputs.

Oryza sativa in Africa

By the 1970s, when Oryza glaberrima was being recognized as an African domesticated rice variety, in the West African nation of Ivory Coast, only about 10% of the rice produced was of the African type. In Mali a significant amount of Oryza glaberrima production remained in the great inland Niger River Delta – the likely origin site of the domestication of African rice.

Oryza sativa and Oryza glaberrima

The sativa rices gave two to three times the output of the glaberrima varieties, but the glaberrima varieties have other advantages we will mention later.

Source: same as previous slide: pages 304-306.
Oryza glaberrima in America?

But can any traces of Oryza glaberrima be found in the New World today?
Oryza glaberrima in America?

Carney (page 153) found direct seed data confirming Oryza glaberrima in Cayenne French Guiana and in El Salvador.
Oryza glaberrima in America?

She found substantial historical evidence for its presence in Brazil, Surinam, Haiti, South Carolina, and Georgia.
In addition to Oryza glaberrima and its production techniques, West Africans brought to the New World:

- **Watermelon** (see more 2 slides down)
- **Okra**
- **Sesame**
- **Black-eyed peas** –

   to read a short *New York Times* essay about how black-eyed peas influence New Year’s celebrations in parts of the USA, click [here](#)
Recently African foods such as *benne* (African sesame), African rice, Tanzanian field peas, African red peas, African squash and Ethiopian blue malting barley have become the basis for a revival of gourmet indigenous American cooking in South Carolina...as featured in the October 31, 2011 *New Yorker Magazine*. (You can get the article in Sprague’s online service or if you are a New Yorker subscriber.)

African Foods in America: 2014 Update

The African domesticated watermelon on the other hand, emerged as partly a symbol of ridicule that some white racists have used to insult and degrade African Americans right up to the present time. A December 2014 article in *Atlantic Monthly* surveys the background to the rise of the watermelon as a racially charged symbol. Some of the information will surprise you. Click here.

African Foods in America: 2014 Update

And – a quintessential American comfort food – fried chicken with a batter covering – turns out to be a gift from African slave cooks in the U.S.
Slaves kept and managed chickens on their small house plots – where they also grew rice as described by Judith Carney in her study of African based rice production that we saw earlier in this slideshow.
Black slave cooks on the plantations brought West African chicken pieces fried in oil to their white masters who took to the new food. This basic chicken dish later became a favorite of immigrant groups from Europe and Asia who added new varieties of chickens from their homelands.

African Foods in America: 2014 Update

You can read the whole story in Lawler’s new book, or just check out a few paragraphs summary that was printed in *The New York Times* on November 26, 2014. Click here.
African Foods in America: 2014 Update

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The Future of African Rice

Today Asian rice Oryza sativa is spreading in West Africa while some older rice areas are going to other crops.

The Future of African Rice

Some experts have even labeled Oryza glaberrima a weed when it grows on the same fields as sativa varieties.

The Future of African Rice

But Oryza glaberrima continues to be grown in some of the original African rice areas.
The Future of African Rice

African domesticated rice has characteristics that offer hope for improving the world food supply.
French agronomists have identified at least 41 varieties of oryza glaberrima.

African Rice and the Human Future

*Oryza glaberrima*, it turns out, has a very short growing cycle – less than 90 days – and thus offers promise for speeding up and therefore increasing the annual production of grains in tidal marshes and swampy areas.

African Rice and the Human Future

Despite its distant origin both in time and geography from *Oryza sativa*, the two can be crossbred to produce hybrids with numerous possibilities in terms of output, disease resistance, timing, and other important qualities.

African rice holds a promise for future generations of a better food supply and wealth and resources more fairly distributed than in the days of the slave trade.
On 13 February, 2018 *The New York Times* Food Food Section D ran a large article by Kim Severson about a new discovery of African Rice found on a farmer’s field on the Caribbean island of Trinidad. The article also discusses various African based recipes for cooking *Oryza glaberrima* and the possibility of planting the newly discovered rice seeds in South Carolina or other U.S. areas.

African Rice

It can be part of a better future for all peoples.
West African Jola culture members are making use of African rice varieties and African farming skills to create Asian and African style rice paddies in New York’s Hudson Valley.

The farmers who are from the Jola culture of West Africa are working with Cornell University agricultural scientists who specialize in developing new plant varieties that will grow in the fairly cold and short season of the U.S. northeast.
In at least one experiment, the traditional non-Western method of seed bed preparation came out superior to the modern approach – but the farmers are not looking specifically to see whose culture produces more and better rice in a cold climate.
African Rice in Upstate New York: 2019 Update

Instead, they are seeking the best outcomes for their 6-acre “Ever-Growing Family Farm.” They and the Cornell scientists are also exploring ways that African rice might become a special adaptation to global warming and climate change. To learn more about their work click the link below.

African Rice

End of Week 11

Lecture 01

African Rice in America