Seasonality in the Trans-Atlantic Slave Trade
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Introduction

The trans-Atlantic slave trade brings to mind images of haphazard, disorganized plunder that randomly scattered about eleven million African people throughout the Americas. When one examines information contained in the Voyages Database, however, one detects patterns in this forced diaspora. Many vessels sailing under Portuguese flag, for example, transported enslaved Africans from West-Central Africa to Brazil; many Dutch ships sailed from the Gold Coast to Surinam. Colonial power and mercantilism provide one reason to explain these trans-Atlantic routes made by slaving vessels. Portugal controlled coastal territories in Angola, such as the ports Luanda and Benguela, and shipped enslaved Africans from these sites across the South Atlantic to their colonial cities in Brazil. The Dutch controlled the Gold Coast fort Elmina and ordered their captains to proceed with slaves to their South American colony Surinam. Portuguese and Dutch laws restricted their slave trades to national carriers.

The Voyages Database also reveals that in all markets on the African coast, more slaves were embarked on board ship during some months than others. Similarly, in all markets in the Americas, more Africans, year after year, were disembarked during certain months. Why were there seasonal patterns? Focusing on the agricultural histories of African and American societies helps to explain monthly fluctuations in the supply of and demand for enslaved Africans. Whether soils supported subsistence or cash crops, each stage in the agricultural calendar—clearing land, planting, weeding, harvesting—requires different numbers of farmers, different “labor inputs.” On both sides of the Atlantic, seasonal crop cycles created seasonal demands for agriculturalists. The trans-Atlantic slave trade reconciled supply and demand for agricultural labor when captains transferred farmers from “in crop” seasons in Africa to “in crop” seasons in the Americas.

In shifting captives between Old and New World ecological zones, captains created systematic trans-Atlantic patterns when African and American crop cycles differed by the time needed to sail the Middle Passage. In Africa, the numbers of slaves embarked on board ships usually increased during the harvest and in the immediate post-harvest months. During these times fewer and fewer farmers were needed and food stocks began increasing. African merchants purchased slaves whose agricultural labor became temporarily redundant, and they bought seasonal provisions to keep their captives alive. In turn, New World plantation crop production required greater numbers of slaves to cut, gather, and process cane, berries, or leaves. Slaving captains attempted to trade “in season” in both Africa and the Americas by identifying American markets whose cash crop harvests seasons took place 1-3 months after harvest cycles in Africa. Those
captains who linked Old and New World food-production cycles sailed along regular trans-Atlantic pathways and synchronized agricultural calendars.

**Agriculture in the era of the trans-Atlantic slave trade**

In examining seasonality in the trans-Atlantic slave trade, it is important to focus on agricultural history because the majority of people in the Atlantic world lived on farms, producing crops and raising livestock. During the era of the slave trade, 1514-1866, most sub-Saharan Africans from rural communities, forced across the Atlantic, continued their farming lives by working New World lands. They grew some familiar provisions, including crops imported from Africa, like Guinea corn (millet) or West African rice. However, many saw crops such as sugar, tobacco, coffee, indigo, cacao, or cotton, for the first time.

Though historians lack data on precolonial African demography, it is reasonable to suggest that most Africans forced overseas were farmers or pastoralists. Men and women, adults and children, helped to produce yearly supplies of millet, sorghum, rice, maize, yams, cassava, plantains, or other crops. The ratio of men, women, and children working on farms varied by crops and region, but all villagers worked together clearing land, planting, weeding, and storing crops to produce sufficient amounts of food to enable communities to survive through the out-of-crop hungry seasons. Smaller numbers of enslaved Africans transported across the Atlantic were craftsmen or professionals; as African towns grew in size in the late eighteenth and nineteenth centuries, so too did the numbers of urban residents who were enslaved.

For those eleven million African peoples who survived the Middle Passage, the majority would labor on plantation lands producing provisions and cash crops. As in Africa, ratios of men, women, and children working in the fields varied by crops and region, and the hungry months occurred before the year’s harvest. About 5.25 million African migrants worked in sugar cane, and perhaps 1.5 million toiled on tobacco, coffee, rice, indigo, cotton, and cacao estates. Another 1.5 million people worked in livestock pens, or on plantations producing millet, maize, wheat, cassava, or forestry products. An estimated one million enslaved Africans worked in silver and gold mining, but mostly before 1750. Brazilian gold, important particularly in 1690-1750, drew in perhaps 500,000 African workers. Household work or ranching occupied the lives of 750,000-1,000,000 African men, women and children.

**Seasonal rainfall in the Atlantic slaving world**

In most regions in the Atlantic slaving world the growth of crops and sufficient pasture for livestock depended upon seasonal rainfall. Those people living in rainforests would have been familiar with intense summer downpours; those living towards deserts or in
rain shadows would have known droughts lasting many months. Most Africans experienced greater precipitation extremes than those living in the Western Hemisphere. For people who survived their trans-Atlantic passage, ninety-five per cent would labor in tropical and sub-tropical regions in the Western Hemisphere marked by seasonal rainfall. Comparatively few enslaved Africans experienced the temperate year-round rains in Chesapeake and mid-Atlantic lands to the north or those temperate rains in the Rio de la Plata, the southernmost Atlantic slaving market.

In Atlantic Africa, shifting air masses produce July-October rains north of the equator and January-April rains south of the equator. In the principal slave-trading zone, from 15° North Latitude (above Senegal) to 15° South Latitude (below Benguela), coastal rains double the volume of precipitation just 20-30 miles inland. Deluges from Conakry (in modern Guinea) to Bassa (Liberia) match the rainfall in the Douala estuary of Cameroon—these are the rainiest pockets in the Atlantic world. Travelling south from the Senegal River, where twenty inches of rain fall annually, mostly in the summer, one reaches the northern extent of the rainforest above Sierra Leone (8-9° N), where ninety inches of rain fall in July and August. Heavy summer rains continue in dense rainforests stretching from Sierra Leone to the Windward Coast. Rainy season deluges commence along the eastern Bight of Benin and in the Bight of Biafra, precipitation amounts increasing during summer as one sails towards the equator. Once south of the Zaire River, one enters the driest coastline in Atlantic Africa, where farmers can expect to see less than fifteen inches of rain each year, mostly in February-April.

In contrast to precipitation in Atlantic Africa, there is less rainfall in most New World slaving markets and few droughts. The greatest downpours occur in the spring-summer in the tropical rainforests of northern South America from Surinam (5-6° N) to Pará (1-3° S). The 1,250-mile Brazilian coastline from Paraíba (6° S) to São Vicente (24° S) includes a tropical zone, with a hot and humid climate and no pronounced dry season; the hot and humid subtropics, with a two-month dry season; and a temperate region, with a warm climate and dry winters. In Bahia, there are two moderate rainy seasons, separated by heavy May rainfall. Farther south, in Rio de Janeiro, the year's first substantial rain occurs in March. Most rain falls in the West Indies in the fall and winter, but the wettest low-lying areas only reach the precipitation levels of the driest rainy seasons in Atlantic Africa. In the Carolinas and the Chesapeake, June-August summers are the rainiest times, but there is also significant December-February precipitation, levels similar to those experienced during winters in maritime climates of Europe.

**Rainfall, crop type and agricultural calendars**

Rainfall, temperature, sunlight, humidity and soil type determines crop choice and regulates agricultural calendars. Maximizing plants’ nutritional content requires precise growing cycles under optimal ecological conditions. For most subsistence and cash
crops, farmers plant just before or during rainy months and harvest during dry, sunny months. Crops needing long periods of sunshine to maximize yield include grains, cereals, and cane starches. Intense ultraviolet light damages coffee and other berries. Yams and other tubers are long-growing tropical foods, requiring 8-10 months underground. Except for rice, most crops do not grow well in rainforests, because downpours leach soils of nutrients and roots cannot tolerate waterlogging. Cold winters in the continental climates of the New World kill sugar, coffee, cacao, and cotton plants. Rainfall loosens soils to facilitate digging and sowing, and all seeds and cuttings require water to propagate; as sunlight and warm, dry weather ripen plants, caloric content increases. In ecosystems that support short-growing plants and have two rainy seasons, farmers can produce two crops per year.

Millet, sorghum, rice, maize, yams, and cassava, principal African crops, grow in ecosystems that dictate agricultural calendars. Millet and sorghum are often the only food plants grown in the semi-arid and arid 10-15° N belt, three hundred miles inland from the African Atlantic coastline. Farmers plant these cereals during the first rains in June, which soften the rock-hard soils, and in early November, at the end of the rainy season when floodwaters begin to recede. The short-season crops flower in 90-180 days; harvests occur in September-December and February-May, depending on rainfall. The two cereals also thrive in the long dry winter seasons of the Congo savannah, and may have grown further west before being displaced by manioc. Rice is the staple from the Lower Gambia south to Sierra Leone and along the Windward Coast, rainy coastlines that allow rice to grow in its requisite water depth of 4-6 inches. It grows from June (rainy season) to November (onset of dry season). Maize, a New World crop imported in the 1600s, requires sufficiently long, dry, sunny periods, and thrived mainly in the central Gold Coast. South of 10° N one finds ideal conditions, as in much of Nigeria, for yam cultivation: 85° F temperatures, rainfall totalling 60 inches, a 2-3 month dry season, sufficient sunlight, and free-draining soils.

Sugar, tobacco, coffee, and rice were the major New World cash crops. In the tropical Americas, sugar (with its by-products rum and molasses) was the principal plantation commodity. Planting occurred during rainy months, June-October in most of the West Indies, and the cane grows over a 14-18 month period. Saccharine matter reaches its greatest content during the ripening period when stalks dry. In the West Indies, dry seasons usually occur from January to May, though there are microclimates in the larger and mountainous islands, such as Haiti (before 1804, French St. Domingue), Dominica, and Jamaica. The best ecosystems for tobacco were located in the Chesapeake Lowcountry and Bahia, where high summer humidity keeps growing leaves moist and drier fall air allows them to dry and be cut. In the late 1700s, coffee groves became important in well-draining, shaded mountain ecosystems, the six-month fruit cycles ending during dry-season berry picking. Wet rice proved profitable in humid, low-lying areas prone to flooding, as in the coastal Carolinas, Georgia, Surinam, and
northeast Brazil. On South American rice fields, slaves cleared land during the August-November dry season, planted in winter rains, and harvested between March and May. The Carolina rice and indigo cycles began in February and ended in November. Though a crop associated strongly with plantation slavery, cotton did not dominate many areas until the 1800s, and comparatively few African-born slaves worked on cotton plantations.

**Agricultural calendars and labor requirements**

Agricultural production requires different numbers of farmer-hours, “labor inputs,” at various stages in plants’ growth cycles. Labor intensity differs by the type of crop and the ecosystem in which the plant lives. Crops planted annually in shifting agricultural communities required heavy labor inputs clearing land and sowing seed. In regions prone to unexpected drought, all available people hurried to sow during the season’s first rains. After the planting season, families weeded and controlled insect and bird pests—work less dependent upon physical strength. Some crops required long workweeks to transplant shoots from seedbeds to fields. On both sides of the Atlantic, farmers worked intensively during dry season cane, fruit, berry, leaf, or cereal harvests.

African crops require varying numbers of farmer-hours during land clearing, planting (“crop establishment”), weeding, and harvesting/threshing. Sorghum and millet, often inter-cropped, demanded intense labor during the summer rains when the cereals were planted and weeded. Threshing the cereals demanded fewer worker-hours. In the coastal West African rice region, from July to early October villagers cut mangrove trees, built dikes, and transplanted rice to paddies. Labor demand intensity is highest during the October/early November harvest. Rice is the most labor-consuming African crop. Men and women plant maize each year; along the Gold Coast and in the Bight of Benin the spring and fall equinoxes marked the beginning of the planting weeks. Weeding was the most labor-intensive activity in maize cultivation, but, as with other crops, children helped weed plants and eradicate pests. Growing yams in the Biafran hinterland requires the greatest labor inputs during the clearing/planting (January-April) and harvesting (August-October) seasons, and the fewest hours of crop work during spring/summer weeding.

New World merchant-planters’ demand for workers increased during dry seasons north and south of the equator, when crops ripened, dried, and needed to be harvested. Sugar was the most important slave-produced crop, the one with the longest crop cycle, and the one that placed the greatest short-term demands on workers. Hours worked in cane-holing, trenching, and cutting tripled those hours worked by modern factory hands. Intensive tobacco work occurred when men and women transplanted tobacco stalks to the fields and they cut and stripped tobacco leaves. In the rice-growing Carolina/Georgia Lowcountry, Surinam and Maranhão, labor intensity increased when
workers sowed seed, hoed wet fields, and harvested and processed rice. Planters throughout the Plantation Americas hired seasonal workers (“hired slaves”) to help harvest and process cash crops.

**Provisioning-slaving seasons**

Seasonality in Atlantic slaving markets linked closely to food supplies, since merchants, whether African, European, or American, would not purchase large numbers of people they could not keep alive. There were distinct provisioning-slaving seasons in Atlantic regions dependent upon a short rainy season and a staple crop. In more diversified early modern economies, often those with fewer dry months (and hence more evenly distributed rainfall), food production and labor requirements on farms became less seasonal. Provisioning-slaving seasons ebbed during rainy planting months and increased during and after dry season harvests. After crops were harvested and stored, African merchants sold enslaved farmers and provisions to coastal middlemen who, in turn, sold these captives to ship captains.

In Africa, Upper Guinea (from Senegal to the Ivory Coast) and the Bight of Biafra had marked provisioning-slaving seasons. In Senegal and Gambia, millet stocks increased in March-May before the summer rains. May-July was correspondingly the greatest quarter in the Senegambian slave export trade—three times greater than in the September-November quarter. Along the Sierra Leone/Windward Coasts, the rice-slave season began in November and supplies of food and people began to dwindle in late April. In spring 1751, south of Sierra Leone, Liverpool captain John Newton VoyageID 90350, the author of “Amazing Grace,” purchased late-season rice and slaves. He remarked on April 30th in his logbook, held today at the National Maritime Museum (UK), “the season is so far advanced.” Sierra Leone/Windward Coast slave exports from March to May almost doubled totals from June to August. In the Bight of Biafra, the season’s first yams arrived in markets in July and August; the peak harvest occurred in October, and supplies remained until February or March. September-November slave exports doubled those totals from June-August. Fewer dry months along the Gold Coast or Bight of Benin enabled farmers to often double-crop maize and other cereals. Given greater food supplies, slave exports exhibited less of a seasonal trend. Traders also did not identify provisioning-slaving seasons along the West-Central African coast. With few foodstuffs available for export overseas, the link between harvest cycles and slave supplies is weakest in the South Atlantic African slaving markets.

The timing of dry season grain and cash crop harvests regulated the New World demand for enslaved African labor. The sugar producing West Indies and Guianas imported more slaves during the December-May corn and cane harvests. In Brazilian sugar-producing centers, such as Bahia, the provisioning-slaving season centered on the drier November-February quarter. During three months of the harvest season, slave
import figures ranged from twenty-nine percent of annual totals (Cuba, Pernambuco, Bahia) to forty-four percent (northwest Jamaica). In the smaller non-sugar-growing regions of North and South America, captains disembarked comparatively large numbers of slaves in-season during rainier months. Chesapeake tobacco planters only demanded new migrant farmers during the April-May spring rains, when men and women transplanted tobacco stalks to the fields, and in June-August, before harvesting and curing. The autumn corn harvest provided food stocks to sustain workers forced to produce the annual tobacco crop. In the rice-growing Carolina/Georgia Lowcountry, Surinam, and Maranhão, planters purchased twice as many workers during the four in-crop months.

**Slave-trading seasonality: case studies**

To spotlight seasonality in the trans-Atlantic slave trade, consider slaving voyages that departed from New Calabar, Bight of Biafra (Elem Kalabari, Nigeria), and those that arrived in Barbados. New Calabar was a major embarkation point for enslaved Africans from the Bight of Biafra; in 1650-1700 one-third of all Africans shipped from the region passed through the village, located on the New Calabar River. In the 1630s and 1640s, the Dutch were the first Europeans to challenge Portuguese dominance in New Calabar; by the late 1670s, the London-based Royal African Company (RAC) outfitted the majority of slaving ships to this African trading site. Regarding Barbados, the RAC stationed agents in its main port, Bridgetown, and in the late 1600s the island-colony produced more high-quality sugar per acre than any region in the Atlantic world.

Between 1654 and 1851, the Voyages Database documents 315 slaving trips that departed New Calabar for the Americas. Of these, one can estimate months of departure for 257 voyages, and plot departure months against the estimated number of slaves embarked. Results indicate that slave exports from New Calabar dropped during the period of yam planting and weeding (March-June) in the hinterland, and then exports rose sharply in August as workers harvested yams, peaking during the main harvest in October. They then decreased by February-March, a period that coincides with declining yam stocks (Figure 1). In 1677-78, Arthur Doegood captained one of the RAC slaving voyages to New Calabar VoyageID 9990 and his logbook survives in the National Archives in London. Doegood anchored at New Calabar in mid-February 1678, after the optimal fall provisioning-slaving season. Within a week, his supercargo, George Hingston, complained that he was not “free to deale in many [slaves]” because we “have noe provitions for them,” “findeing yames very scarse.” By April many of the yams he bought were “rotten” and he was forced to buy unripe “green plantins.”
Two months after departing New Calabar, Doegood arrived in Carlisle Bay, Barbados when slaves were producing the last barrels of sugar. Agent Hingston’s journal entry on 30-31 May 1678 indicates that he had arrived at the beginning of the out-of-crop rainy season: “the next day rainy weather were not many buyers on board.” The rains would last through early November, followed by drier weather and winter-spring grain and sugar harvests when planters demanded greater numbers of newly enslaved African workers. Information contained in the Voyages Database indicates that slave imports into Barbados began increasing towards the beginning of the “in crop” provisions and sugar season, and then began declining in March after provisions’ harvests and as less and less sugar needed to be cut and processed (Figure 2).
Trans-Atlantic pathways and harvest cycles

African and Atlantic coastal markets exhibited varying seasonal patterns in the numbers of slaves exported and imported. In the most seasonal slaving markets in the Atlantic world—Senegambia in Africa and the Chesapeake in the Americas—rainfall and temperature constraints reduced the number of “in crop months” and narrowed merchants’ trading windows. Comparatively few enslaved Africans shipped from northwest Africa between rainy July and November; Virginia and Maryland planters purchased most of their new agricultural workers between April and October. In Upper Guinea markets, most captains began sailing the Middle Passage in the North Atlantic spring, a time of the year that would place them in American markets in the North Atlantic summer. Strong links between Upper Guinea and the Carolinas-Chesapeake occurred because trans-Atlantic agricultural cycles meshed.
Captain Robert Doegood’s voyage on the Arthur in 1677-78 reached slaving markets in Africa and the Americas at the end of in-crop seasons, making this voyage atypical of those sailing from the Bight of Biafra to the West Indies. In the century prior to the American Revolution, British vessels departing Biafran ports in March or April often attempted to reach the in-season summer North American slaving markets rather than risk uncertain demand in out-of-crop Caribbean colonies. After May, with each passing month they decided increasingly to sell slaves in the British West Indies. Northern planters infrequently purchased enslaved Africans shipped from the Bight of Biafra’s fall provisioning-slaving season (Figure 3).

French and Portuguese slave traders also shifted agricultural workers between trans-Atlantic harvest cycles. Cap Français, the largest French West Indian port and the principal disembarkation center for French slaving vessels in northern St. Domingue, has the island’s rainiest October-February winter; the greatest number of enslaved
Africans, correspondingly, arrived in the dry April-June quarter. In southern St. Domingue, the dry season occurs earlier, in December-February, the harvesting months and time of increased planter demand for labor. Whereas northern St. Domingue drew upon Senegal’s January-April provisioning-slaving season, French planters in the south purchased comparatively more Africans shipped overseas during the September-December provisioning-slaving seasons in the Bight of Biafra. In the late 1700s, the Portuguese resettled trading posts in coastal Guinea-Bissau, a staple rice region with a marked November-April provisioning-slaving season. Captains purchased enslaved Africans during these months to work in the May-July Maranhão rice season.

Conclusion

In many markets in the Atlantic world monthly cycles of slave exports and imports, documented in the Voyages Database, link to dry season crop harvests. African and European dealers on the African coast purchased provisions and slaves. Some markets, such as those along the Senegal and Gambia Rivers, had distinct provisioning-slaving seasons. Ecological conditions set agricultural calendars and the dates when workers gathered and stored foodstuffs. African middlemen pegged their slave-trading seasons to in-crop months, and some agricultural workers, sold into the overseas slave trade, may have been forced to consume the foods they produced. By moving captives between harvests on the Atlantic littoral, slaving ship captains created regular pathways, such as those between yam-growing Bight of Biafra and the sugar islands of the Caribbean, or those between millet-rice Upper Guinea region and North American rice and tobacco lands. In examining slave trading routes, historians need to consider agricultural calendars on both sides of the Atlantic.

Though there were monthly cycles of slave exports and imports, year-round shipments took place in all markets during the 350-year history of the trans-Atlantic slave trade. In the most seasonal African slaving region—Senegambia—about fifteen percent of all enslaved Africans departed the coast in the out-of-crop, rainy, September-November quarter. Even in the most seasonal market in the Atlantic slaving world—the northern plantations of Virginia and Maryland (36-39° N)—small numbers of forced migrants arrived in the winter, when no crops were grown. In the large Bight of Biafra – Jamaica migration stream, forty percent of enslaved Africans arrived on the island during the June-November out-of-crop season. And many would have sailed from Bonny, Old Calabar or New Calabar from April to July when yam stocks were low or depleted. Variability in the Middle Passage voyage time, due to contrary winds, caused some captains to arrive out of season; one assumes that there also was variability in the time taken to march captives towards the African coast.

It is important to examine these unseasonal slave trades. In Africa, they remind us that the slave trade was a predatory activity. Warfare between African states often took
place after the principal grain harvest and during the dry season, but conflicts could erupt at any time, and during every day of the year raiders could attack communities or kidnap people. Seasonal rainfall and crop-growing constraints did not completely limit the plunder of people. Captains who traded towards the end of “in-crop” seasons in Africa, such as Robert Doegood, risked purchasing greater numbers of malnourished men, women and children. Doegood traded at New Calabar when yam supplies were low; his logbook reveals that eighty Africans died on the Middle Passage (of 348 people) and four more in harbor at Barbados. Historians should examine more closely the links between provisioning-slaving seasons and mortality. In the Americas, investors were willing to purchase enslaved labor from any African region during any day of the year—the labor of enslaved Africans maintained the Colonial System. Trading during out of crop seasons, on both sides of the Atlantic, increased the chances that irregular, non-systematic migration patterns occurred—a true diaspora or “scattering” of African peoples in the Americas.