

# Environmental Consequences of Connectivity

*Dead bodies filled every corner.*

—Giovanni Boccaccio (1313–1375)

**Essential Question:** What were some of the environmental effects of trade in Afro-Eurasia from c. 1200 to c. 1450?

**A**lthough trade networks enabled the spread of novel agricultural products, such as the introduction of certain citrus fruits to the Mediterranean basin, the most dramatic environmental consequence of increased commerce was not food, but rather disease. Bubonic plague or “Black Death” swept from Central Asia; struck in China, India, Persia, and Egypt; and arrived in Europe in 1347. The epidemic is estimated to have killed from 75 to 200 million people in Eurasia and peaked in Europe from 1347 to 1351. Boccaccio, whose famous work *The Decameron* was inspired by living through the plague, described the horrors he saw.

## Agricultural Effects of Exchange Networks

Along with luxury goods, spices, textiles, and religions, merchants in some places introduced crops where they had not grown before. The new crops often had an impact on land use and population growth and distribution. In some areas, people found ways to sustain abundant production; in others, overuse of the land led to environmental degradation.

**Migration of Crops** Few crops had as significant an impact as the quick-ripening **Champa rice**, which was introduced to the Champa states by Vietnam, a Hindu state, and then offered to the Chinese as tribute. Because of the Hindu influence on Champa in present-day central Vietnam, some scholars believe Champa rice may have originated in India. It was drought-resistant, flood-resistant, and capable of yielding two crops a year. It was widely distributed in China to meet the needs of the growing population and in turn contributed to the population growth.

It also had an impact on land use. Through terraced farming in the uplands and paddies in the lowlands, Champa rice was grown in many parts of China where once land was thought unusable for growing rice. Nonetheless, as the

population of China grew, people tended to migrate southward to the original rice growing region, contributing to the growth of cities.

Indonesian seafarers traveling across the Indian Ocean had introduced **bananas** to Sub-Saharan Africa. The nutrition-rich food led to a spike in population. Many Indonesians settled on the island of Madagascar. Bananas allowed the Bantu-speaking peoples (see Prologue) with their metallurgy skills and farming techniques to migrate to places where yams—a traditional food source—did not easily grow. To grow bananas, farmers increased land for cultivation, which enriched diets and led to population growth.

As caliphs conquered lands beyond the Arabian Peninsula, they spread Islam, the Arabic language, and the cultivation of cotton, **sugar**, and **citrus crops**. New foods were also available at the markets along the trade routes. The markets of Samarkand, for example, introduced new fruits and vegetables, as well as rice and citrus products from Southwest Asia, to Europe. Europeans' demand for sugar would become so high that it became a key factor in the massive use of enslaved people in the Americas in the 1500s and after. (Connect: Compare the techniques used by Chinese farmers to raise food products with the techniques of Indonesian or Vietnamese farmers. See Topic 1.1.)



**Source:** Library of Congress, Prints and Photographs Division

This photo was taken in 1911 of a vendor in the central Asian city of Samarkand. In the valleys in this region, people have long grown melons, grapes, apples, citrus fruits, pomegranates, apricots, peaches, and other fruits. These products were then widely distributed by merchants who traveled on the Silk Roads.



**Environmental Degradation** Increases in population put pressure on resources. For example, **overgrazing** outside of Great Zimbabwe was so severe that people had to abandon the city in the late 1400s. (See Topic 1.5.) In feudal Europe, overuse of farm land and **deforestation** led to **soil erosion**, reducing agricultural production. The Little Ice Age (c. 1300–c. 1800) also contributed to a decrease in agricultural products. Environmental degradation was a factor in the decline of the Mayans in the Americas as well.

## Spread of Epidemics through Exchange Networks

While scholars in Dar al-Islam and India were developing advances in medical understanding and treatment, no knowledge at the time could have prevented the spread of deadly infectious diseases that accompanied trade. The Mongol conquests helped to transmit the fleas that carried the **bubonic plague**, termed the Black Death, from southern China to Central Asia, and from there to Southeast Asia and Europe. Some historians believe the caravanserai that housed people and animals together may have contributed to the spread of the disease, since the animals likely carried infected fleas.

The Black Death had a tremendous impact on Europe, killing one-third of the population there in a few years. With fewer workers, agricultural production continued its decline. However, the reduced number of workers led to a new relationship between workers and those they worked for: each person’s labor became more valuable, so workers could demand higher wages. This shift helped lay the groundwork for the economic changes that developed as feudalism declined.

The Black Death led to similar loss of life in other areas, including North Africa, China, and Central Asia. About 25 million Chinese and other Asians died between 1332 and 1347. South Asia and Sub-Saharan Africa were spared because there were few trading ports in those regions.

KEY TERMS BY THEME		
<b>ENVIRONMENT: Crop</b> Diffusion Champa rice bananas sugar citrus crops	<b>ENVIRONMENT: Degradation</b> overgrazing deforestation soil erosion	<b>ENVIRONMENT: Disease</b> bubonic plague

## Comparison of Economic Exchange

*“Wealthy merchants bring in big cargoes, which they unload and unhesitatingly send into the markets without thinking in the meantime of any security, or checking the account, or keeping watch over the goods. ”*

—Abdu Razzak, “Description of Calicut” (1442)

**Essential Question:** What were the similarities and differences among the various networks of exchange in the period from c. 1200 to c. 1450?

**C**alicut was known as the “City of Spices,” a market city where merchants traded their goods for pepper and cinnamon from India and a variety of goods from other areas as well. In some ways, such as its ability to provide security and the diversity of people who patronized the markets, Calicut was like other big trading cities along the well-traveled trade routes. In other ways, such as the type of currency it used and how the polity, or governmental unit, made money on trade, it differed from trading cities elsewhere. The similarities and differences among trading cities were also reflected in the larger trading networks.

### Similarities Among Networks of Exchange

Several major trading networks connected people in Africa, Europe, and Asia in the years between c. 1200 and c. 1450:

- the Silk Roads through the Gobi Desert and mountain passes in China and Central Asia to Southwest Asia and Europe, on which merchants tended to specialize in luxury goods
- the monsoon-dependent trade routes in the Indian Ocean linking East Asia with Southeast Asia, South Asia, and Southwest Asia, on which merchants exchanged goods too heavy to transport by land
- the trans-Saharan trade routes from North Africa and the Mediterranean Basin across the desert to West and East Africa, on which merchants traded salt from North Africa with gold from the kingdoms south of the desert



While each exchange network had its unique characteristics, all were similar in their origins, purpose, and effects.

**Origins** Interregional trade began well before the common era as agrarian cultures consolidated into stable settlements. The trade that flourished between c. 1200 and c. 1450 built on the routes these early traders—and conquerors—first traced. As kingdoms and empires expanded, so did the trade routes they controlled and traveled.

The Postclassical trading networks also needed the stability of established states to grow and expand. Stable kingdoms, caliphates, city-states, or empires assured merchants that the routes and the merchants themselves would be protected—which is why the wealthy merchants in Calicut could walk away from their cargoes knowing they would not be stolen. Stable polities also supported the technological upgrades that made trade more profitable—nautical equipment such as the magnetic compass and lateen sail, high-yielding strains of crops, and saddles to allow for the carriage of heavy loads of goods.

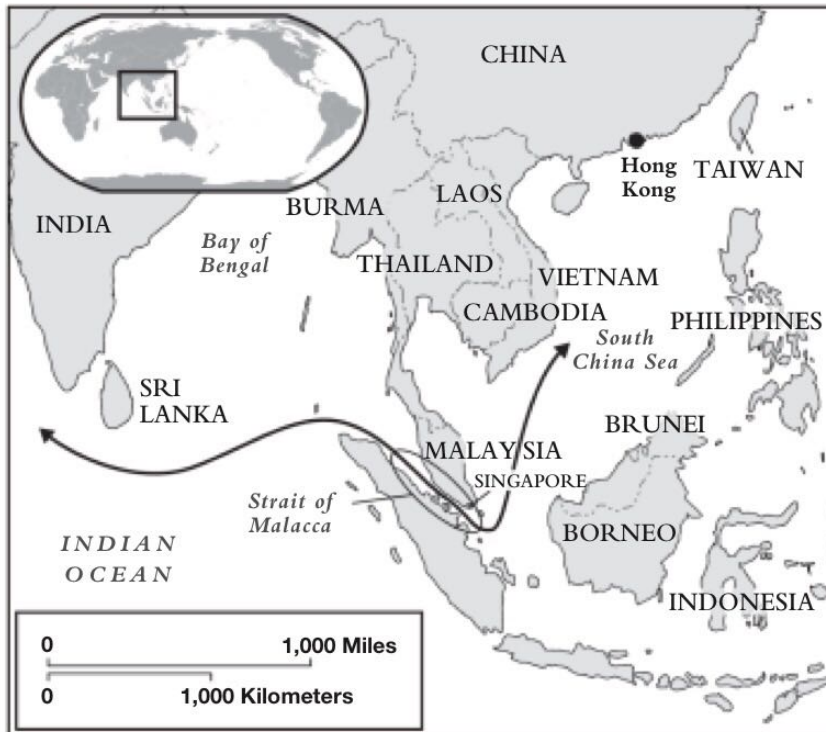
**Purpose** The trading networks shared an overall economic purpose: to exchange what people were able to grow or produce for what they wanted, needed, or could use to trade for other items. In other words, their purpose was primarily economic. However, as you have read, people exchanged much more than just products. Diplomats and missionaries also traveled the trade routes, negotiating alliances and proselytizing for converts. Together, merchants, diplomats, and missionaries exchanged ways of life as well as economic goods.

**Effects** All the exchange networks also experienced similar effects. Because of the very nature of a network—which can be described as a fabric of cords crossing at regular distances, knotted for strength at the crossings—the trade routes all gave rise to trading cities, the “knots” that held the network together.

Routes	Trading Cities
Silk Roads	Chang'an (present-day China), Samarkand (present-day Uzbekistan), Aleppo (present-day Syria), Mosul (present-day Iraq)
Indian Ocean	Malacca (present-day Malaysia), Calicut (present-day India), Hormuz (present-day Iran), Mombasa (present-day Kenya), Alexandria (present-day Egypt)
Trans-Saharan	Gao, Timbuktu (both present-day Mali), Marrakesh (present-day Morocco), Cairo (present-day Egypt)



### Strait of Malacca



The shortest route from East Asia to Southwest Asia on the Indian Ocean trade route was through the Strait of Malacca.

The growth of trading cities gave rise to another effect of the trade networks: centralization. Malacca, for example, grew wealthy from the fees levied on ships and cargoes passing through the Strait of Malacca. To prevent piracy, Malacca used its wealth in part to develop a strong navy—an endeavor that required centralized planning. Trading cities along each of the trade routes underwent similar developments, using their wealth to keep the routes and the cities safe.

Another aspect of trade in the cities that encouraged centralization was the desire for a standardized currency. Widely accepted currencies sped up transactions and enabled merchants to measure the value of products.



Many trading cities also became known as centers of learning. This is the Ulugh Beg Madrasa (Islamic religious school) that was built in Samarkand between 1417 and 1422.

**Source:** La madrasa Oulough Begh du Registan (Samarcande, Ouzbékistan)

**Author:** Jean-Pierre Dalbéra from Paris, France



## Differences Among Networks of Exchange

Despite their similarities, the networks of exchange were different in some ways, especially in the goods they exchanged, the nature of the routes and transportation, the technologies they inspired, and the religions they spread.

Routes	Goods	Transportation	Religions
Silk Roads	<p><b>East to West:</b></p> <ul style="list-style-type: none"> <li>• silk</li> <li>• tea</li> <li>• spices</li> <li>• dyes</li> <li>• porcelain</li> <li>• rice</li> <li>• paper</li> <li>• gunpowder</li> </ul> <p><b>West to East:</b></p> <ul style="list-style-type: none"> <li>• horses</li> <li>• saddles</li> <li>• fruit</li> <li>• domestic animals</li> <li>• honey</li> <li>• textiles</li> </ul>	<ul style="list-style-type: none"> <li>• horses</li> <li>• camels</li> </ul> <p><b>Technologies</b></p> <ul style="list-style-type: none"> <li>• saddles</li> <li>• caravanserai</li> </ul>	<ul style="list-style-type: none"> <li>• Buddhism from South Asia to East and Southeast Asia</li> <li>• Neo-Confucianism from China to Korea, Japan, and Vietnam</li> <li>• Islam from Southwest Asia to South Asia</li> </ul>
Indian Ocean (and Mediterranean Basin)	<p><b>From East Africa:</b></p> <ul style="list-style-type: none"> <li>• gold</li> <li>• ivory</li> <li>• quartz</li> <li>• animal skins</li> </ul> <p>From Southwest Asia:</p> <ul style="list-style-type: none"> <li>• citrus</li> <li>• fruits</li> <li>• dates</li> <li>• books</li> </ul> <p>From Southern India:</p> <ul style="list-style-type: none"> <li>• textiles</li> <li>• peppers</li> <li>• pearls</li> </ul>	<ul style="list-style-type: none"> <li>• dhows</li> <li>• junks</li> </ul> <p><b>Technologies</b></p> <ul style="list-style-type: none"> <li>• stern rudder</li> <li>• lateen sail</li> <li>• astrolabe</li> <li>• magnetic compass</li> </ul>	<ul style="list-style-type: none"> <li>• Buddhism from South Asia to East and Southeast Asia</li> <li>• Neo-Confucianism from China to Korea, Japan, and Vietnam</li> <li>• Islam from South Asia to Southeast Asia</li> <li>• Christianity from Mediterranean Basin</li> </ul>
Trans-Saharan	<p><b>North to South:</b></p> <ul style="list-style-type: none"> <li>• horses</li> <li>• books</li> <li>• salt</li> </ul> <p><b>South to North:</b></p> <ul style="list-style-type: none"> <li>• gold</li> <li>• ivory</li> <li>• cloth</li> <li>• slaves</li> </ul>	<ul style="list-style-type: none"> <li>• caravans of camels for carrying goods</li> <li>• people walked</li> </ul> <p><b>Technology</b></p> <ul style="list-style-type: none"> <li>• saddles to increase load bearing</li> </ul>	<ul style="list-style-type: none"> <li>• Islam from Southwest Asia and North Africa to Sub-Saharan Africa</li> </ul>



The trading networks also had unique currencies and commercial practices. For example, at one time silk was not only a commodity but also a currency. In places in Southeast Asia, tin ingots were used as a currency standard. West African states used cowrie shells as currency.

In time, however, states shifted to a money economy based on gold and other metal coins. To make commerce less bulky, the Chinese invented “flying cash” (see Topic 2.1) and established the precursors of banks, including the practice of extending credit.



Fanam coins from the Eastern Gupta Dynasty in Kalinga (1078–1434)  
Source: Wikimedia Common Credit: Sujit Kumar

## Social Implications of Networks of Exchange

The rising demand for luxury goods spurred efforts to make production more efficient than it had been. China went through a period of proto-industrialization as it sought to meet the demand for iron, steel, and porcelain. (See Topic 1.1.) New business practices, such as partnerships for sharing the risk of investment, began to emerge.

The production of goods such as textiles and porcelain in China and spices in South and Southeast Asia increased to meet demands. As the amount of goods increased, the volume of trade on maritime trade routes began to supersede that of the overland trade routes. Larger ships were needed as well as improved navigational knowledge and technology.

**Labor** The demand for labor rose along with the growing demand for products. The forms of labor from earlier periods continued—free peasant farmers, craft workers or artisans in cottage industries, people forced to work to pay off debts, and people forced into labor through enslavement. Trade in slaves was common along the Indian Ocean and trans-Saharan routes.

Large-scale projects—irrigation canals, military defenses, great buildings—called for the work of thousands of organized laborers. Kinship ties often played a role in coordinating these large-scale projects. An observer in the Vijayanagara Empire in South India in the 1300s describes the work of completing a giant reservoir:



“In the tank I saw so many people at work that there must have been fifteen or twenty thousand men, looking like ants, so that you could not see the ground on which they walked, so many there were; this tank the king portioned out amongst his captains, each of whom had the duty of seeing that the people placed under him did their work, and that the tank was finished and brought to completion.”

*Narrative of Domingo Paes (1520–22)*

**Social and Gender Structures** The typical social structures during the period between 1200 and 1450 were still defined by class or caste, and societies, with rare exceptions, remained patriarchies. There were, however, areas where women exercised more power and influence. For example, even though the vast Mongol Empire was a patriarchy, Mongol women had somewhat more freedom than women in most other parts of Afro-Eurasia. Mongol women moved about freely and refused the burka from the West and foot binding from the East. Women were also often top advisors to the great khan.

In Europe, women worked as farmers and artisans, and they had their own guilds. In Southeast Asia, women were skilled in the practices of the marketplace, operating and controlling marketplaces as representatives of powerful families. Outside of these limited areas, however, women within other major regions still experienced far fewer opportunities and freedoms than men in virtually all aspects of life.

**Environmental Processes** The interconnections that spurred so much vibrant economic and cultural exchange also led to a steep population decline as merchants, diplomats, and missionaries transferred the bubonic plague and other infectious diseases along the trade routes. The plague, named the Black Death, contributed to the decline of once-great cities, such as Constantinople. Most believe that at least a third of Europe’s population died during this period. China experienced outbreaks in the 1330s and 1350s, causing tens of millions of deaths.

Changes in trade networks led to cultural diffusion and the development of educational centers in cities such as Canton, Samarkand, Timbuktu, Cairo, and Venice. Political instability and increased agriculture strained the environment. For example, soil erosion from deforestation, or overgrazing, forced growing populations to migrate to other areas.