The Effects of Timber Haulage Improvements on Mahogany Extraction in Belize: An Historical Geography

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Abstract

From the late 1700s through the mid1900s, the economy of Belize was based on the extraction of mahogany (*Swietenia macrophylla* King). Variations of mahogany exports over long periods of time were linked to the accessible supply of the resource. Thus, improvements in hauling methods helped the cutters satisfy increasing demands for mahogany by enabling them to extract timber from areas in the interior that had been previously inaccessible to them. Immediately after the introduction of cattle in the early 1800s, tractors in the 1920s, and lorries in the 1940s, production levels rose dramatically.

Introduction

The economy of Belize[1] (Figure 1), formerly the British colony of British Honduras, historically has been based on the extraction of mahogany (*Swietenia macrophylla* King). Mahogany formed the core of Belize's export economy from the late 1700s, when it surpassed logwood in export value, to the mid 1900s, when it declined relative to the growing sugar, citrus, and banana industries. Global demand for the precious wood has been the important attracting force that created the great interest for mahogany cutting in Belize. However, external demand for mahogany does not completely explain the success of the industry. Improvements in hauling techniques over the years were key in making possible the extraction of greater quantities of mahogany to respond to the external demand for the wood. This paper focuses on the vital role that hauling improvements have played in the growth of the Belizean mahogany industry.[2]

Historical Background

Taking advantage of Spain's inability and apparent disinterest in establishing control over present-day Belize, Englishmen[3] began to settle in the territory around the year 1680. These early Englishmen focused on the cutting of logwood (*Haematoxylon campechianum* L.), a dyewood greatly valued in Europe as the principal dyestuff for the expanding woolen industry (Camille 1996b). By the 1770s, a second tropical exotic timber, mahogany, replaced logwood as the main export from Belize, although a small quantity of cedar (*Cedrela odorata* L.) has always been exported along with mahogany. Until the 20th century, virtually all Belizean mahogany was sent to England for the furniture and shipbuilding industries. Although mahogany was first sought in Belize for British shipbuilding, it became associated with the furniture industry by the late 1700s. Mahogany has long been regarded as a premier hardwood for fine cabinetry because it has excellent finishing characteristics; the reddish-brown wood polishes to a high luster.

Beginning in 1763, a series of treaties between Spain and Britain gave the English **[end p. 103]**

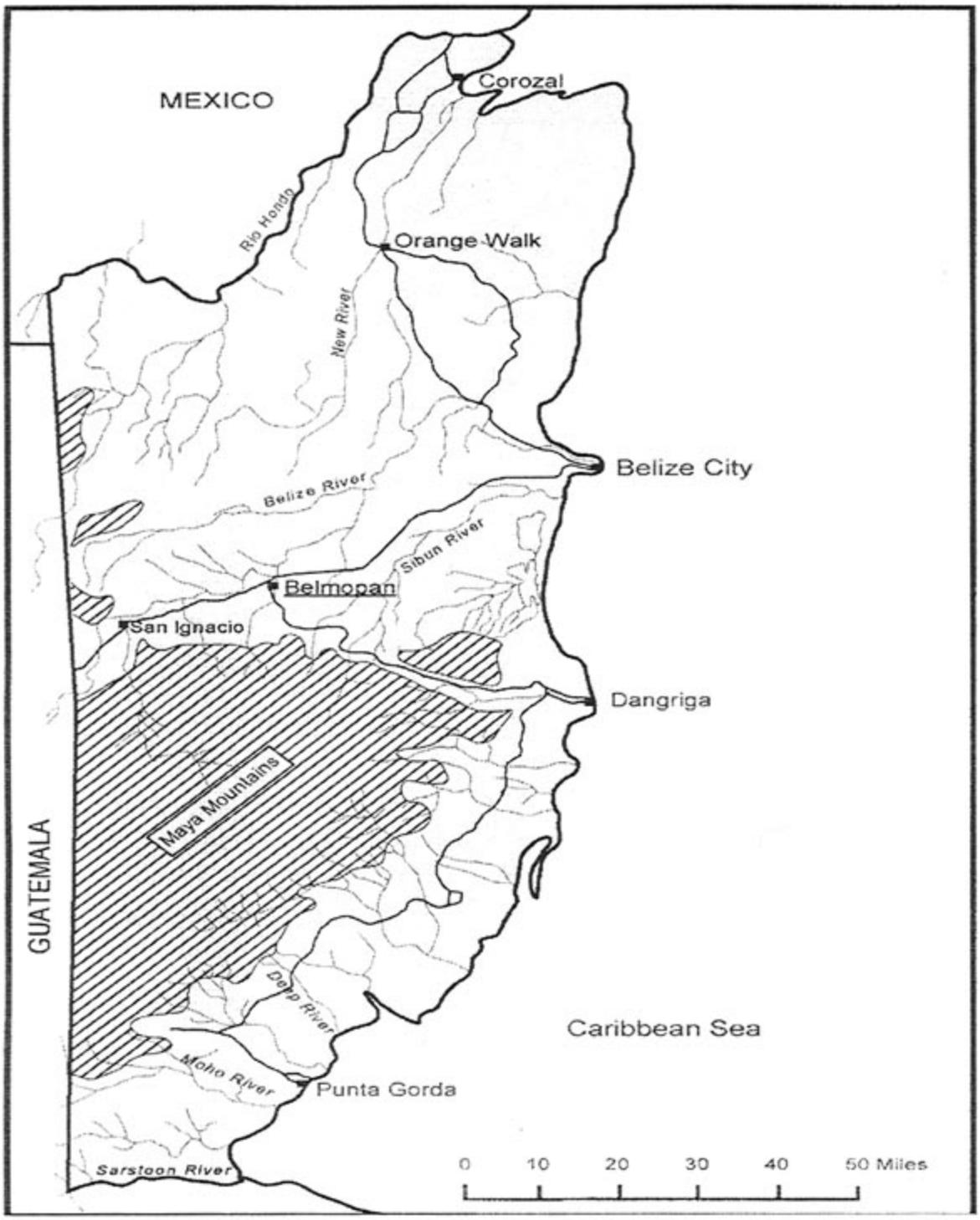

Figure 1. Belize. Source: DOS (1991).

settlers rights to cut and export timber unmolested in the northern half of present-day Belize. By 1786, the Englishmen had been granted rights to cut timber as far south as the Sibun River. By that time, the settlers of Belize were already well involved in the mahogany trade; the exports of mahogany outnumbered those of logwood by ten to one (Bolland 1988). As part of the 1786 agreement, Britain evacuated all settlers from the Miskito Coast in present-day northeastern Honduras and eastern Nicaragua. Many of these English settlers relocated in Belize with their African slaves and immediately turned their attention to mahogany cutting.

Although the treaties reaffirmed Spain's sovereignty over Belize, Spanish officials largely ignored the activities of the territory and only occasionally visited it to ensure compliance with the treaties. After the Englishmen defeated attacking Spanish forces at the Battle of St. George's Caye in 1798, Spain never returned to assert its claim to territory in Belize (Dobson 1973). Their victory at St. George's Caye gave the English settlers confidence to extend their timber cutting into "virgin" areas south of the treaty limits in present-day southern Belize. Mahogany cutters had begun **[end p. 104]** operations on the Deep River by 1800, on the Moho River by 1814, and on the Sarstoon River by 1825 (Humphreys 1961).

Mahogany Extraction

The mahogany tree is one of the giants of the tropical rain forest, the largest individuals exceeding a height of 150 feet. Each tree requires approximately 120 years to reach its marketable diameter of 22 inches (Snook 1998). Unlike logwood, mahogany grows isolated in a mixed forest and is not restricted to coastal locations. Thus, the range of mahogany cutting was much greater than that of logwood as cutters had to search more land in order to take out one tree. In the virgin forest, mahogany occurs at very low densities--an average of one commercial-size tree per hectare (Snook 1998).

The sparse distribution of mahogany has shaped the economic geography of Belize since the 1700s. Because the mahogany cutters first cut the most accessible trees close to the coast and along the lower course of rivers and streams, timber in these locations soon became exhausted. The presence of mahogany hundreds of miles in the interior attracted industrious cutters away from the coast. Keeping riverine and coastal sites as bases, they moved increasingly further into the interior in search of mahogany trees for felling. The inland movement of the timber extraction frontier became especially rapid in the late 1700s as mahogany cutters searched for new cutting areas to satisfy an increasing European demand for the precious wood. However, as European demand for Belizean mahogany increased, the settlers began to complain that most of the accessible areas within the 1786 treaty limits had been cut out (Dobson 1973).

Despite mahogany's profound importance in the economic history of Belize, the timber extraction frontier was a "hollow" one, as its movement over the centuries was not followed by permanent settlement. Once the cutters extracted all of the accessible mahogany timber from one area, they left their mahogany camps for the forest to overtake and moved to other areas where timber was more readily available. There are no permanent settlements in Belize that evolved as a result of timber extraction.[4]

Various 19th and early-20th century writers have described mahogany operations in Belize (Henderson 1809; Leas in BA 1863; Duval 1881; Morris 1883; Foreign Office 1919). In December, at the end of the wet season, a mahogany crew selected an area for cutting and established a "camp" on a stream bank to process the timber for transport down the river. From the camp, an experienced hunter searched through the forest for several days looking for suitable trees within hauling range of the camp. In the 1880s, Morris (1883) reported that the minimum cutting girth for mahogany was 18 inches squared. The crew began cutting the trees in January, at the beginning of the dry season, and most hauling occurred in April and May, when the ground was hard after several months of dry weather (Morris 1883). Initially, hauling was done by the crew, most of whom were African slaves. Oxen began being used in the early 1800s and tractors were introduced in the 1920s.

Whether moved by human, animal, or machine, individual logs were hauled over narrow trails or "tracks" to the stream bank. At the camp, the logs were squared and stamped with a special seal for later identification. When the rains came and the stream flooded in June, the cutters floated the logs downstream. Unlike logwood, which is dense enough to require transport on rafts downstream, mahogany floats on its own. Near the river's mouth, the mahogany logs collected behind a "boom," a large iron chain stretched across the river. At the boom, the marked logs were identified by their respective owners and formed into rafts for

transport to Belize City and ultimately to the market in London (Fowler 1879).

Prior to the 1900s, mahogany was exported to England in squared form because such logs were easier and cheaper to ship than round ones (Callahan 1990). Beginning in the early 1900s, some of the mahogany shipped to England and all of the mahogany destined for the United States was exported in the round (*Clarion* Jan. 27, 1921; GB 1931C). The annual totals of timber **[end p. 105]** exports were affected by whether rains in the wet season were sufficient to ensure the flooding needed to float the logs from the river bank. When dry conditions prevented floating, cutters had to wait until the following wet season to move the logs from the headwaters of the streams.

From the various descriptive accounts of 19th and early-20th century observers, it is surprising how little mahogany operations would change through the early 1900s. In the haulage of timber, humans were replaced by oxen in the early 1800s, which in turn were replaced by tractors in the 1920s. However, the other components of the system remained essentially unchanged over the decades. Not until the introduction of giant logging lorries in the 1940s did this primitive extraction system significantly change.

Haulage Methods

Human Haulage

Originally, human haulage was the sole means of dragging timber. Men dragged logwood along tracks to the nearest stream bank. Apparently, the effective limit of logwood hauling was 1,500 paces (approximately one mile) (Dampier 1699). Initially, the Englishmen hauled the wood. themselves, with every man expected to pull his share. They began to bring Africans into the territory in the 1720s via the Caribbean slave markets to work as woodcutting slaves alongside them in the forests (Henderson 1809). The number of slaves in Belize was quite small when logwood dominated the economy. Probably no more than 200 slaves were in Belize through the mid-1700s, although population figures varied greatly in this era due to Spanish threats (see Bolland 1987). Relatively few slaves were needed in the logwood works because mature trees only grew to fifteen to twenty feet in height and to less than a foot in width (Foreign Office 1919). Furthermore, logwood could be and was broken into smaller pieces to make hauling easier. Dampier (1699:80) describes this procedure in the Yucatán in 1676: "Some fell the Trees, others saw and cut them into convenient Logs...and when a Tree is so thick that after it is logged, it remains still too great a Burthen for one Man, we blow it up with Gunpowder."

The shift in economic orientation from logwood to mahogany extraction largely explains an increase in the number of slaves in Belize beginning in the late 1700s (Bolland 1988; Camille 1996a). By 1786, only 600 people of African descent resided in the settlement (calculated from "Disposal of Miskito Shore Settlers" July 1787, in Burdon 1931, and from Colonial Office 1790). By 1800, slaves outnumbered whites 3000 to 300 (Colonial Office 1803). Bolland (1987) found that nearly 90 percent of all male slaves from twenty to fiftynine years of age worked as woodcutters in 1834. A greater number of slaves was needed in mahogany operations because the tree proved much more difficult to haul than logwood. Mahogany grows much larger than logwood and, unlike logwood, it was only valuable if it arrived at the market intact. The greater security that the white settlers enjoyed after 1763, when Anglo-Spanish treaties began affirming their rights to cut timber in northern Belize, may also partly explain their decision to bring in more African slaves.

Slaves were organized into mahogany "gangs" often to fifty men, who manually dragged the logs to the camp. Colonial Secretary Henry Fowler (1879:46) describes the use of mahogany gangs in the late 1700s and early 1800s:

> [A] gang was put on board a vessel which was sent to anchor at the mouth of one of the rivers,

> whilst the gang went ashore, cut the wood, and shipped it; 30 days lay being generally allowed for every 100 tons of wood. No cattle were necessary to haul the logs, the timber was found on the river banks, manufactured, skidded into the water, and towed off to the ship.

Thus, this system of log haulage limited mahogany extraction to relatively flat areas along the banks of suitable rivers and streams.

Oxen

The timber concerns made a significant improvement in the haulage by use of oxen thus **[end p. 106]** enabling them to access a greater amount of timber than had previously been possible. In the first decade of the 1800s, mahogany cutters were importing "horned cattle" from neighboring Spanish territories. Henderson, in 1809, describes the lucrative trade in oxen that had quickly developed between Belize and Honduras involving a few individuals. For oxen, the Englishmen bartered linen shipped in from England and sugar and rum imported from the West Indies, usually making a 500 to 600 percent profit on the exchange. Although some of the oxen purchased from Honduras were slaughtered for meat, they were used primarily as draft animals in the logging industry (Henderson 1809).

To bring the logs from the forest to the stream bank, the mahogany gang used the oxen to drag ("skid") the logs or to pull rudimentary four-wheeled carts ("trucks") (Duval 1881:62). The trucking process was noted as early as 1846 (BA 1846). Morris (1883:47) describes the trucking and skidding operations thus:

During the dry months of the year the logs are carried on trucks drawn by bullocks. The truck is a ponderous framework, mounted on four broad wheels about 3 feet in diameter, with 9 inches tread.. During wet weather, when the ground is too soft for the trucks to travel, mahogany is drawn on slides, or a kind of sleigh, which passes over "skids." The latter consist of long, hard wood posts, about 3 inches in diameter, placed across the track about a yard apart.

The cutters always trucked mahogany at night under the glow of pinewood torches to avoid the searing daytime heat (Duval 1881; Morris 1883). This method of haulage remained the standard means of dragging timber to the rivers until the 1920s, when tractors were introduced.

The introduction of oxen greatly increased the distance that logs could be dragged to a stream, enabling timber cutters to penetrate deeper into the forests. With this improved system of haulage, loggers could move logs up to ten miles. Slaves, on the other hand, could not drag logs more than a mile. Oxen also enabled loggers to drag timber over irregular terrain (Morris 1883). The mahogany cutters, thus, could move away from the narrow flat areas adjacent to rivers into forested areas that had not yet been cut out.[5]

Demand for mahogany remained high through the 1800s[6] except for the period from the late 1840s to the mid-1860s[7] (*Blue Book of 1866* [British Honduras] in Burdon 1935). The high market price for mahogany, coupled with low import tariffs,[8] provided the impetus for cutters to make every effort to extract all mahogany of suitable size within hauling range of streams. Settlers and government officials alike in the mid-1800s began to notice the effects of the intense extraction of mahogany in previous decades. By 1839, mahogany was reported as "getting scarcer and scarcer every day..." (*Belizean Advertiser* 1839).[9] Seven years later, Superintendent Fancourt noted that because of the great demand for mahogany, the settlers "were induced to ship, to a great extent, young wood of very small dimensions." (BA 1846:130). He reported in 1849 that all of the mature trees less than three miles from rivers and streams in Belize had already been cut (Superintendent Fancourt to British Minister in Mexico, March 12, 1849, in Burdon 1935). By the late

1870s, cutters had to extend their truck paths eight miles to reach exploitable mahogany (Fowler 1879).

This overexploitation of the resource brought diminishing returns in the decades that followed. After a peak of 10 million feet in the mid-1840s, mahogany exports declined to less than 2.5 million feet through the 1870s (*Belizean Advertiser* 1881, 1882). While demand remained great and prices high for mahogany in 1871, the colony's ability to supply this demand was in some doubt, as stated by the editors of *The New Era* (1871): "How far this colony is capable of supplying the anticipated demand we are unable to state but we should hope our forests are not yet exhausted of the old staple." Of course, the problem was not that the entire colony was exhausted of mahogany, but that the marketable trees accessible to loggers using oxen haulage had been cut out. The areal extent of forest **[end p. 107]** disturbance during this period was thus limited to a narrow strip on both sides of the major rivers and their tributaries, where the cutting of mahogany without replanting led to a decline of these particular trees relative to other forest species (Forest Officer C. Hummel in *The Clarion* March 10, 1921). The situation did not improve through the first decades of the 1900s. In 1920, although "mahogany was in steady request" (*The Clarion*, Jan. 6, 1921), a resident remarked that the trees were "rare and inaccessible" (Benigno Sampson's letter to the editor, *The Clarion* July 15, 1920).

The market for Belizean mahogany made a remarkable shift to the United States in 1902 when American firms began buying Belizean mahogany to supply the developing sawmilling and veneer industries in the United States (GB 1904C).[10] The proportion of Belizean mahogany sent to the United States increased from less than one percent at the turn of the century to 90 percent by the mid 1920s (calculated from GB 1896BBGB 1930BB; GB 1915C-1946C). While buying in the United States was increasing in the early 1900s, demand for Belizean timber was low in Britain and, ironically, American sawmillers using Belizean mahogany supplied Britain's lumber demands. Mahogany lumber milled in the United States from Belizean stock was preferred in Britain over mahogany timber imported directly from Belize. As a result, Belize became an increasingly important source of a raw material that created growth in the manufacturing sector of a foreign country whose growth depended on the British market (GB 1927C). In this exchange, Belize was becoming more dependent on the United States than in any period in the past.

Tractors

In the early 1920s, at a time when the demand for mahogany was much greater than the accessible supply, the introduction of gas-powered tractors, road-skidding equipment, and large log wagons provided the means to extract mahogany from "virgin" forests further away from the river and outside the profitable range of oxen haulage. Once again, a hauling improvement increased the potential source area for mahogany extraction. A government report noted in 1925 (GB 1925C:17) that, "The accessible mahogany forests of the Colony have been severely overcut, but the demand continues good and supplies are being maintained by pushing operations into the remoter tracts by means of gasoline tractors and short logging railways. Operation by cattle-haul is being steadily superseded [sic] by mechanical traction." Six years later, the government reported (GB 1931C:12) that "animal haulage is practically obsolete."

The tractors pulled 8-wheeled trailers capable of carrying three or four large trees at once (GB 1946C). These new machines had revolutionary implications because they increased the hauling distance for timber to approximately 15 miles (GB 1925C). However, because of the slow speed of the tractor, approximately walking speed, the logger was effectively restricted to cutting within 15 miles of a river. A round-trip of 30 miles took approximately 10 hours, making it only marginally profitable (GB 1954C). The introduction of tractors did impose additional seasonal constraints on the movement of timber. Timber could only be hauled during the dry season when paths were dry enough to allow passage by tractors.

As a result of the exploitation of new areas made accessible by the tractor, mahogany exports reached unprecedented levels in the 1920s (GB 1925C). From 1890 to 1923, exports of mahogany averaged between

5 and 10 million square feet per year. From 1924 to 1930, that figure increased to between 10 and 15 million square feet per year. During this boom period in the mid- and late-1920s, mahogany comprised over 70 percent of the annual export value of all of the colony's domestic goods (calculated from GB 1880BB-1930BB, GB 1915C-1930C). The mahogany trade declined sharply in the early 1930s because the worldwide depression suppressed demand for processed wood in the American sawmilling industries (GB 1931C). Also, Belizean mahogany increasingly had to compete with Peruvian, Brazilian, and West African mahogany (GB 1934). Less than one million square feet of mahogany per year were **[end p. 108]** exported from Belize in 1932 and 1933, the lowest levels since the 1700s (calculated from GB 1933BB-1934BB, GB 1932C-1934C).

With this new improvement in haulage, the basic geography of extraction did not change. The tractors dragged timber to a nearby stream bank over a rough path as oxen had in the previous century. The logs continued to be floated by river to the coast because the transport of timber to market remained more economical by river. This explains why the timber concerns did not call for improved road transportation even with the introduction of the tractor.[11] Thus, in part because of the economy's continued dependence on mahogany extraction, Belize had only a scant network of roads before the 1930s. The interior of Belize continued to be reached principally by motor boats and doreys (GB 1932C). Colonial Secretary H.G. Pilling (GB 1930C:17) described the state of Belize's road network in 1930 as such: "There are a few miles of improved roads near Belize, Corozal, Cayo [San Ignacio], and Punta Gorda, but no communication exists for wheeled vehicles between any of these places. The roads shown on the map of the Colony are mostly indifferent bush tracks or bridle paths only." Although the government did begin to construct permanent roads into the interior of Belize in the 1930s, the projects were designed primarily to spur the ex-tension of agricultural settlement (Camille 1994).

The mahogany industry witnessed a post-Depression revival in the late 1930s and 1940s, spurred by a renewed interest in mahogany by North American milling interests and by the development of a local sawmilling industry. The Belize Estates and Produce Company, the largest landowner in the colony, built Belize's first modem sawmill near the mouth of the Belize River in 1932 (GB 1934; Anderson 1952). This mill, for the first time, enabled the colony to export mahogany, cedar, and other primary hardwoods as lumber in addition to simply round or squared timber. In the mid- to late-1930s, an average of fifty percent of the exports of mahogany from Belize was in the form of lumber. By the late 1950s, nearly all of Belize's mahogany was exported in lumber form (calculated from GB 1930BB-1943BB, GB 1930C-1964/65C). The shift towards sawmilling enabled Belize to improve its position in the mahogany trade and to avoid the harmful effects of great market fluctuations, as the demand for lumber was more stable than for timber (GB 1938C). However, the post-depression mahogany trade had taken a different appearance because the market for lumber differed greatly from that of timber.

Mahogany timber continued to supply sawmills in the United States and American buying and milling concerns extended contracts to Belizean loggers as in the past. Lumber, on the other hand, went principally to Britain (GB 1934C; GB 1952C). Although demand for mahogany increased after the end of the Depression, loggers found they could not move enough wood to cover their expenses as tractor hauls became longer and longer (GB 1954C). Smaller immature trees were increasingly being felled with resulting diminishing returns. By the late 1930s, one-half of the mahogany logs exported from Belize were immature (less than 18 inches in diameter) (GB 1925C; 1938C). Once again, overexploitation within the hauling range of the existing technology was limiting the growth of the mahogany industry.[12]

Logging Lorries

Another improvement in hauling technology made possible record production levels after World War II and brought great changes to the Belizean mahogany industry, with lasting effects on the settlement geography

of the entire colony. The giant 10-wheeled logging lorry, locally called a "camiün", was introduced into Belize in the late 1940s. With its articulated pneumatic tires, the lorry was capable of carrying enormous loads at high speeds for unlimited distances (GB 1953C; 1954C). Before long, chain saws, skidding equipment, and mobile milling machines were also introduced into Belize.

The lorry was responsible for most of the post- World War II growth of the mahogany industry, as its great transport range allowed mahogany cutters to extract wood from rich **[end p. 109]** timber areas well beyond the profitable range of the tractor. Thus, the penetration of "virgin" areas deep in the interior proceeded at an impressive pace(GB 1953C, 1954C). The lorries had another advantage over previous hauling technologies: they were able to bring the timber directly to the river rather than to a shallow stream to wait for a flood. This meant that the cutters did not have to rely on uncertain floods to float the logs into the river for transport to the river mouth. With lorries, therefore, the cutters did not face the prospect of having their logs rot at the stream bank because of an insufficient level of flood waters during the wet season or face losing their logs deep into the surrounding forest because of excess flood waters. The ability to place the logs directly into the river also meant that cutters received early payment for their timber, rather than having to wait for months until the flood waters brought their logs to the market (GB 1953C, 1954C).

Because lorries could not work effectively on bush trails, timber cutters suddenly became reliant on road transportation to move their timber from the interior, ending centuries of almost complete reliance on the river systems of Belize. F or the first time, the timber concerns were adding their voice to those of the agriculturalists in calling for road improvements (GB 1955C). The government responded with an impressive road-building campaign immediately thereafter, constructing hundreds of miles of main and feeder roads and building several bridges to make transportation possible during the wet season (BA 1959). The total length of improved roads in Belize increased from 139 miles in 1935 to 265 in 1947, to 411 in 1954, and to 658 miles by the time of self government in 1964 (BA 1959; GB 1961).

Despite the introduction of the new hauling technology and the profound changes it brought to the mahogany industry and to the landscape, Belize's economy has undergone a remarkable shift in its orientation in the last fifty years away from the forestry sector. After World War II, mahogany lost much of its market as the public began to favor lighter color woods and as fiberglass, plastic, and aluminum were increasingly substituted for mahogany planking and plywood (Callahan 1990). Government promotion of agricultural activities in the early 1900s eventually led to the growth of the sugar, citrus, and banana industries (Camille 1994). The momentum in the agricultural sector increased in the 1950s and, by the end of the decade, the value of agricultural exports exceeded those from the forest for the first time (calculated from GB 1937C-1964/65C). Indeed, over the past fifty years, mahogany exports have been on a downward trend. In the 1990s, mahogany had become a relatively insignificant part of the Belizean economy, accounting for less than 2 percent of the value of the country's exports (GB 1993). In stark contrast, the value of the three major agricultural exports (sugar, citrus, and bananas) has skyrocketed; together they accounted for 60-70 percent in value of the county's total exports in the 1990s (Perry et al. 1992).

Conclusion

Short-term variations in mahogany exports were caused by a variety of factors, including weather, world market demand, and trade restrictions. However, variations of mahogany exports over long periods of time were linked to the accessible supply of the resource. Decades of intense mahogany cutting eventually led to diminishing returns. The development of improved haulage methods, however, opened up new areas of "virgin" forest, bringing a considerable increase in mahogany exports. With mahogany scattered throughout Belize and adjacent territories, the increasing demands for mahogany led the loggers to develop new ways to extract and transport more timber to the market. The introduction of oxen, tractors, and lorries each, in their time, greatly impacted the mahogany industry. Immediately after each of these transportation

improvements were introduced into Belize, mahogany production levels rose dramatically. Each new technological shift enabled the cutter to move further away from the river to extract wood in unexploited areas. Because these new cutting areas had not been previously cut, the amount of available mahogany **[end p. 110]** increased significantly.

Technological constraints for removing mahogany had protected the resource from exploitation in all areas except those near a river. When this limitation was removed in the late 1940s with the introduction of logging lorries, mahogany in virtually all parts of Belize became accessible and consequently vulnerable to depletion. Because of centuries of overexploitation, the available stock of mahogany in the Belizean forests today is but a small fraction of its former amount. As loggers removed the marketable mahogany in an area within hauling range and left undisturbed hundreds of other species with little or no market value, the changing forest composition in extraction areas discriminated against mahogany. Moreover, this selective logging depleted individual trees with desirable tree form and disease resistance qualities, leading to genetic erosion (Rodan et.al. 1993; Bird 1998). However, the impact of selective logging over the centuries on the forests of Belize as a whole has been minimal mainly because of mahogany's low forest density. The logging of mahogany did not result in significant structural damage to the forest. In exploited areas, selective felling creates an average of one treefall gap per hectare, the maximum diameter of which is 60 feet. Skidding the logs to a logyard on a stream bank creates a forest disturbance trail less than 15 feet wide (Snook 1998). Mahogany, which had been Belize's most important export for 200 years, occasionally accounting for over 70 percent of the value of the territory's exports, is no longer a major product from Belize. Nevertheless, some loggers continue the long tradition of searching the forests for mahogany. These mahogany cutters rely primarily on a hauling technology, the logging lorry, introduced a half century ago to move their timber.

Notes

1. Belize was officially an English "settlement" (sometimes referred to as simply "Honduras") in the Bay of Honduras from the time of the first English inhabitants. It was referred to as a settlement at Belize Rivers Mouth until the 1800s. The apparent first use of the name "British Honduras" was in 1802 (Records of the Grand Court, July 2, 1802, in Burdon 1934:55-56). In 1862, the territory became the British colony of "British Honduras." The settlers continued to govern the colony until 1871 when they voluntarily abolished their representative form of government to accept British authority, thus becoming a "Crown colony." In 1964, Britain granted the colony internal self-government which led to complete independence in 1981. With self-government, the name "Belize" was adopted to replace "British Honduras". In this paper, the name "Belize" is used to refer to the area of the present-day country regardless of the time period involved. Belize is bounded on the north by Mexico and on the south and west by Guatemala. The country is 174 miles long and 68 miles in breadth, which is about the same size and shape as New Hampshire. The total land area of mainland Belize, excluding the 450 tiny cayes that run parallel to the coast, is 8750 square miles. The territory is sparsely settled with slightly over 200,000 people. Its population density of 23 people per square mile is by far the lowest in Central America. Belize City, the dominant city in Belize since the time of the first English settlers, was the capital of Belize until 1970. In 1970, Belmopan was established as a forward capital in the nation's center to encourage immigration from overcrowded Belize City to the sparsely settled interior.

2. Most of the information comes from newspaper articles and government records and reports contained in the Belize Archives Department in Belmopan, Belize. Many thanks to Mr. Charles Gibson and his staff at the Belize Archives who made every effort to make my stays in Belmopan as productive as possible.

3. Early accounts refer to settlers from the British Isles as "English" although, undoubtedly, a few Scotsmen and Irishmen were in the group. In this paper, "English" or "Englishmen" is used to refer to these early

settlers. The English were cruising the waters of the Caribbean from the late 16th century and London (the British political capital) approved and often funded pirate expeditions against Spanish vessels in the Caribbean. It is difficult, if not impossible, to establish the exact year of the first English presence in Belize. The early Englishmen were not prone to keeping records and they often tried to keep their activities secret. Although the foundation date and the record of many early visits to Belize still elude the historian, we can safely assume that, by the mid-1600s, English pirates were using the Belize coast as a base from which to attack Spanish vessels passing offshore on the established convoy routes (Camille 1996b).

4. Land-holding patterns in Belize changed dramatically as the exploitation of mahogany replaced that of logwood in the late 1700s. The settlers increased the size of their land parcels and monopolized landownership. Immediately after receiving Spanish permission to fell mahogany within the 1786 treaty area, the settlers drew up resolutions estab- **[end p. 111]** lishing "mahogany works" which were unsurveyed parcels of land alongside a river on which an individual had exclusive rights to cut mahogany (Meeting of Committee, July 25, 1787, in Burdon 1931). Ownership of works, however, was not implied (General Meeting of the Inhabitants of Belize, April 10, 1765, in Burdon 1931). The establishment of mahogany works replaced the earlier granting of "logwood works." A logwood works was similar to a mahogany works in that it was a right granted to extract timber in a specified locale. The holder similarly did not have ownership rights. A mahogany works was larger than a logwood works because, unlike logwood, mahogany trees do not grow in stands. A typical mahogany works ran for three miles parallel to a river and its sidelines extended eight miles "aback" or one-half the distance to the nearest navigable river. It was not long before mahogany works were thought of as freehold property that could be sold (BA 1846). A small number of wealthy and politically influential settlers quickly acquired most of the best timber lands in the early 1800s, in effect creating a landed oligarchy (Bolland and Shoman 1977).

5. The increasing number of oxen used in the mahogany works led to the development of a mahogany extraction/pasture/maize complex. Mahogany cutters relied on oxen, which required grazing land and large quantities of maize. Therefore, unimproved pastures and maize plots were found near mahogany camps (GB 1954C). The mahogany cutters employed a free-range system of grazing. With this extensive system, oxen grazed on unimproved pastures along the banks of major rivers (Duval 1881). At these riverine sites, the mahogany cutters constructed holding pens for their oxen. Today, places names such as "Cowpen" and "Beattie Pen" remain as reminders of their former significance as oxpens. Maize came into demand as feed for tired animals in the pastures and for fresh animals hauling timber in the works (GB 1953C).

6. The continued high demand for mahogany led to a growing British interest in Belize in the early 1800s. While the British Crown officially continued to accept Spain's claim of sovereignty over the Bay of Honduras in the early 1800s, it did not discourage the settlers from making resolutions that ignored the Spanish wishes. Following the independence of the Central American states in 1823, the statements and actions of the Crown suggested that Britain was beginning to consider the land between the Sibun and Sarstoon Rivers as falling within its realm. Fifteen years later, the Crown's representative in Belize began making land grants in this southern half of Belize (Camille 1994). The British role in Belize continued to grow in the decades to follow as the Crown began proclaiming that Belize had become "part of the Dominions of Her Majesty" (BA 1852). Encouraged by London's increasingly paternalistic gestures towards Belize, the settlers adopted a chartered political constitution in 1854 and successfully petitioned to become a formal colony in 1862 (Camille 1994).

7. The Belizean mahogany trade sharply declined in the late 1840s because a global depression brought a lower demand for precious woods and because new British free-trade policies meant that Belizean mahogany had to compete on an even basis with finer-quality Cuban mahogany (*Swietenia Mahogani* Jacq.). The next fifteen years were lean for the mahogany cutters in Belize (GB 1934; Olien 1987).

8. To ensure a steady supply of mahogany, the British Crown in the 1820s established a system of differential duties for mahogany and other imported woods that favored Belizean cutters. By 1820, Belizean mahogany and cedar entering Britain were taxed at the rate per ton of £316.0 as against £5.0.0 for Greater Antillean wood and £11.17.6 for timber from other places (BA 1821). A change in the tax structure by the British Parliament in 1832 again favored Belizean woods. Duty on mahogany from Belize was established at £1.10 per ton, as against £5.00 and £7.10 for timber from British colonies and from other places respectively (BA 1833, 1834). This system of favorable duties for Belizean mahogany was phased out in the 1840s as the Crown slowly moved toward a free-trade policy for most raw materials (Halstead 1983). Thereafter, Belizean mahogany had to compete with woods from other countries on a relatively even basis in the London market.

9. The dwindling supply of accessible mahogany in Belize by the 1830s led some settlers to consider cutting mahogany in the untouched forests of the nearby Miskito Coast. Little European activity had occurred on the Miskito Coast since the evacuation of 1786. British gestures in the mid-1830s appeared to signal a changing attitude towards the Miskito Coast. After fifty years of considering the Miskito Coast as being outside of its sphere of influence, Britain began to assert greater sovereignty over the region. In 1836, Britain extended the preferential duty on mahogany, which had previously applied only to timber from Belize, to wood from the Miskito Coast. The following year, the British representative in Belize, Superintendent Alexander MacDonald, began to support the interests of the Belizean cutters on the Miskito Coast (Olien 1987). The mahogany trade on the Miskito Coast took off after 1836, but it did not flourish for long. As in Belize, the marketable trees within hauling range of the rivers were quickly cut (Naylor 1967). Cutters turned their attention to areas outside of Belize and the Miskito Coast after the government removed duties on all mahogany imported into Britain in 1845. By the late 1840s, Belizean cutters were felling mahogany in neighboring Yucatán and Peten in significant quantities. Mahogany from Yucatán and Peten had been clandestinely shipped through Belize to Britain as a Belizean product as early as the 1820s. Official returns listed the "Bay of Honduras" as the source of 70-75 percent of Britain's total imports during the 1840s. Much of this timber, however, had been cut outside of Belize. The sizeable quantities of mahogany extracted from the Miskito Coast beginning in the late 1830s and shipped directly to England, and from the Yucatán and Peten beginning in the late 1840s and re- **[end p. 112]**exported through Belize, all were listed on the returns of British imports as originating in the "Bay of Honduras" (Naylor 1967:47-48, 62-64).

10. Prior to this time, lumber and veneer firms in the United States imported Central American and African mahogany by way of Liverpool, London, or Hamburg. In the early 1900s, the large U.S. mahogany firms constructed sawmills on their properties to process the timber coming directly from Belize and other locations via steamer (Callahan 1990).

11. The powerful mahogany interests had succeeded over the years in defeating any significant road construction proposals raised in the territory. Content to use the numerous broad rivers that penetrated into the interior, the mahogany group did not want to see increased taxes to pay for the building of roads which they did not need. In 1893, Governor Alfred Moloney proposed constructing an extensive network of roads using revenue earned from a land-tax increase, but the Legislative Council, in which the landed mahogany class had considerable influence, rejected the proposal (Ashdown 1986). This prompted *The Times of Central America* (1895) editor to write, "No wonder there has been no Income Tax on the fortunes made in the Colony! No wonder there has been no Land Tax worth the name on the huge properties kept for mahogany and logwood cutting! No wonder not a single cent is spent making even a passable cart road from Belize! No wonder there is not a road nor a railway in the whole Colony! The mahogany and logwood clique want no roads, no public works, and above all no Income Tax and no Land Tax. Anything in the nature of improvement means taxing their property and diminishing their profits. So long as this clique continues to govern the colony, so long will it remain the same miserable neglected place."

12. In the early 1920s, the beginnings of systematic forest management in Belize brought to an end the unchecked forest exploitation that had been characteristic of the logging industry since the early 1700s.The Forest Department created in 1922 has been responsible for the transition of forestry from an economic activity based on all-out exploitation, with no concern for future resources, to one of intensive utilization and conservation. The Forest Department was responsible for controlling felling and promoting forestry practices on freehold lands, managing non-reserved forested Crown land, and managing lands declared as forest reserve. It was on forest reserves, large tracts of Crown forests managed by the Forest Department, that the Forest Department concentrated its activities. The early work of the Forest Department on these reserves included regulating timber cutting and initiating forest regeneration programs. To complement these measures, the Department employed cutting management practices such as drawing rough felling plans and establishing a girth limit on certain trees felled on Crown land (BA 1931).

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Resumen

Desde el final de los años 1700 hasta la mitad de los años 1900, la economía de Belize estuvo basada en la extracción de caoba (*Swietenia macrophylla* King). Variaciones en las exportaciones de caoba a través de largos periodos de tiempo estuvieron relacionadas con la accesibilidad del recurso. Por lo tanto, la mejora en los métodos de transporte ayudó a los taladores a satisfacer la creciente demanda por caoba, ya que les permitió extraer madera de areas del interior previamente inaccesibles. Inmediatemente después de la introducción de ganado en los años 1800, tractores cerca de 1920, y camiones cerca de 1940, los niveles de producción subieron dramáticamente.
[end p. 115]