Shipbreaking at Alang, India

"What is the right thing for this place?"

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TIAS 498 Independent Study

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Spring 2006

University of Washington, Tacoma

Preface

The ship blows its sharp whistle for a last time. It puts its engine on full speed and heads for the land, wailing and groaning as it reaches a speed that it would never have dared risk at sea. Its steel hull scrapes the sand, reaching into the earth from where it came. Then it stops, grounded, on the end of its final charge, its last journey…

-Sebastiao Salgado

By seeing sustainability as both a local and global event, we can understand that just as it is not viable to poison local water and air with waste; it is equally unacceptable to send it downstream, or to ship it overseas to other, less regulated shores.

-William McDonough and Michael Braungart

There must be an integration of economic, biologic, and human systems in order to create a sustainable and interdependent method of commerce that supports and furthers our existence.

-Paul Hawken

Shipbreaking at Alang, India

"*What is the right thing for this place*?"[1]

The Mayflower, The Discovery, The USS Abraham Lincoln and The Exxon Valdez; these names conjure up strong emotions about new opportunities, heroic endeavors and environmental risk. Ships are an integral part of our American history, lore and economy. They are welcomed into this world with champagne and christening galas, but what of their final hours? Where do time-worn bulk carriers, outdated cruise ships and aging oil tankers go when they have outlived their economic usefulness, or are no longer safe? The end of life for many of the world's vessels is the shipbreaking yard on the beach of Alang, India. Shipbreaking has traditionally been a poorly regulated industry with minimal regard for the health and safety of workers, or the impact on the environment. At Alang, thousands of workers cut apart massive ships with little more than hand tools and brute strength, exposing themselves, their landscape, and the ocean, to hazards and toxic waste.[2] How these conditions were first established, and why they continue today, are important social and environmental questions in light of the fact that "in planetary terms, we're all downstream." [3]

Alang is located on the northwest coast of India in the state of Gujarat. Warm waters from the Arabian Sea flow into the Gulf of Cambay and wash along the stable sandy shore. Shipbreaking began there fulltime on February 13, 1982, primarily because it had the ideal physical characteristics for a scrapping yard. With a tidal range of up to 13 meters (42 feet), it was easy and inexpensive to run ships aground during a full moon and leave them to flounder upright as the waters receded. By 2002, 185 shipbreaking "plots" extended along the beach for almost 7 miles. They ranged from ~164 -787 feet

long and ~ 98 - 393 feet wide. The entire yard covered over 25 square miles.[4] (See Map appendix I).

The overwhelming volume of recycled materials and items from dismantling huge tankers and carriers made it necessary to utilize this much land and waterfront as a scrap collection yard. Alang was the largest shipbreaking yard in the world and processed 3,600 ships from February 1982 to March 2002, with an average of 171 ships per year. The mass and scrap metal value of an empty ship is measured in light dead tonnage (LDT), and the types of ships usually scrapped at the yard ranged from 7,000 to 35,000 tons. The total LDT broken during those 20 years was 26-27 million metric tons.[5]

This remarkable amount of light dead tonnage does not include any salvageable parts or objects still attached to or contained in the vessel when it comes ashore. Shipbreaking or ship scrapping, as defined by the U.S. Occupational Safety and Health Administration (OSHA), is “any breaking of a vessel’s structure for the purpose of scrapping the vessel, including the removal of gear, equipment, or any component of a vessel.” [6]

Often built with toxic components, these ships were historically broken at regulated European dry dock facilities by skilled workers. Then, after the 1970’s, the high costs of environmental controls and employee safety standards drove the work onto cheaper shores.[7] During that time there was a distinct change between Western and Eastern European countries in their focus on environmental issues. As a result, hazardous waste began moving towards the East.[8] Initially, China was the next major ship scrapping destination, but when the “even cheaper shores” of India and Bangladesh became available, they received the bulk of the trade.[9] The business of shipbreaking grew at an

astounding rate where worker safeguards were negligible and considerations for the air, water, and beaches, were almost non-existent.

Documentation from the 2000 U.S. EPA's *A Guide for Ship Scrappers: Tips for Regulatory Compliance* shows that between 1970 and 1982, just 38 % of the 781 U.S. Maritime Administration (MARAD) ships scrapped were handled overseas. The percentage was less for the Navy, who exported only 10 % of their 533 ships designated for scrapping those years. During 1983 – 1994, 0 % of the Navy's 35 scrapped ships went to foreign shores for breaking, while over 99 % of the 213 MARAD ships were scrapped there. Although the EPA report does not specify to which overseas shipbreaking yards these 213 ships went, there appears to be a correlation between the opening up of Alang in 1982, and the sharp rise in the percentage of U.S. ships exported for scrapping in the following 11 years. However, in 1994, because of burgeoning environmental issues and laws prohibiting the export of toxic materials (in particular polychlorinated biphenyls-PCBs), MARAD stopped sending its scrap ships overseas. Successful negotiations with the EPA to approve limited scrap exports occurred in 1997. Ultimately, though, concerns over a potential decrease in domestic shipbreaking, as well as overseas pollution and worker problems voluntarily stopped scrap ship exports. At the time of the 2000 EPA publication, the Navy had not scrapped ships overseas since 1982, and MARAD had stopped sending ships by January of 1998.[10]

Statistics would indicate that those decisions by the Navy and MARAD had little effect on the worldwide shipbreaking business. Lloyd's Register reports on lost and scrapped Registry ships in a yearly "World Casualty Statistics" table. In this case, the GT or gross tonnes of a vessel listed include the hull, everything inside it, and the fuel

onboard. The trend in number of ships scrapped and their GT shows that scrapping increased from 1997 to 1999. In 1997 there were 732 ships scrapped totaling 8,707,072 GT. By 1998, that number had gone up to 750 ships with 12,284,673 GT. In 1999, the 797 ships scrapped equaled 16,182,479 GT. The average age of ships for all three dates was 26 years old.[11]

In all likelihood, most of these 2,279 scrapped vessels, with a combined 37,174,224 GT, were laden with hazardous materials. The International Labour Organization's *Safety and health in shipbreaking: Guidelines for Asian countries and Turkey* (2004) states that:

> Although many of the hazardous materials used to build a ship - asbestos, polychlorinated biphenyls (PCBs), toxic paint such as tributyltin (TBT), and heavy metals – are mostly restricted or banned today, a ship built 20 – 30 years ago still contains these materials. It also carries hazardous and flammable chemicals used for painting, repair and maintenance, etc. Cables and electrical and other control systems contain hazardous material and emit hazardous gases if burned. The paint coat can contaminate air, soil, and water when torched or scraped, and is thus hazardous for human beings and the environment.[12]

Even written in the cautious and disengaged language of an international agency this is frightening, disconcerting information, especially for unprotected workers like those who live and work at Alang.

The health, safety, and environmental consequences of mishandling hazardous wastes during shipbreaking are considerable and long-term. As was noted in the ILO guidelines, the three most significant chemical or toxic materials are asbestos,

polychlorinated biphenyls (PCB's), and tributyltin (TBT). What all three substances have in common, and the reason they are so vital to prolonging the life of a ship, is that they do not easily degrade over time. This quality also means that despite bans and restrictions they continue to negatively impact people and the environment.

Asbestos is made of tiny, naturally occurring, fibrous mineral particles, "amosite, chrysotile, crocidolite and fibrous varieties of tremolite, actinolite, and anthophyllite" that are heat resistant.[13] It was used primarily for its fire retardant capabilities in roofs and floors, and shipbuilders incorporated it into insulation. Asbestos causes a condition of the lungs called pulmonary fibrosis, or asbestosis, which simply means that the lungs lose their elastic ability and respiratory complications follow. It also leads to cancers of the respiratory tract, pleura (a thin membrane that surrounds the lungs) and peritoneum (a thin membrane that surrounds the abdomen). Depending on the exposure level, it can take up to 10 years for symptoms to become full blown. Exposure occurs through particles released into the air, water, or soil, which are capable of traveling great distances on the water or by winds. Contaminated soil merely holds the fibers, they do not deteriorate. In the United States, the EPA banned new uses of asbestos in 1989, and now a person working directly with asbestos must have special training and wear protective clothing. No apparent precautions have ever existed for Alang workers. [14, 15]

Polychlorinated biphenyls (PCB's) are a combination of over 209 different "chlorinated compounds (known as congeners)." [16] These anthropogenic chemicals have no smell or taste and are present in the form of a vapor, a solid or an oily liquid. Their insulating and fire retardant properties were useful as "coolants and lubricants in transformers, capacitors and other electrical equipment," all of which made them equally

valuable to shipbuilders.[17] At many different stages of manufacturing, storage and disposal, PCB's were released into the environment. Like asbestos, PCB's travel extensively on wind currents, but their chemical composition actually binds them to the organic materials in soil and water, so they do not dissipate. The potential for localized contamination is high, as are the cumulative effects of PCB's through the food web, from aquatic organisms to fish to high-level human consumers.[18]

Adults exposed to PCB's present with rashes and acne-like skin problems, and there is evidence that liver conditions and cancers may also develop. Hazards to children are the most severe. Infants born to mothers who ate contaminated fish showed abnormal behavioral development and depressed immune systems. In 1977 the U.S. ceased the manufacture of PCB's, but concerns for recurrent exposure still exist. Cautionary advice from the U.S. Division of Toxicology warns parents to keep children from playing near old sites that may have contained PCB's. Of particular concern is the ingestion of contaminated soil through eating dirt or putting dirty objects into their mouths. Adults who work where they may be exposed to PCB's are advised to shower and change clothes at work because of the risk that they may bring the chemicals home with them. For the general population, fish and wildlife consumption are a possible source of PCB's and the public are asked to check advisories by local agencies and obey those regulations.[19] At Alang, the concentration of PCB's present in 37,174,224 GT of broken ships is no doubt staggeringly high, especially for workers and families that live, fish, or play near the yard.

The third significant hazard for shipbreakers and beaches is tributyltin (TBT), an organotin compound created in the 1960's and used in anti-fouling paint on the bottom of

ship hulls. It is a “biocide,” meaning literally that it kills living organisms. In this case, its chemical structure retards the growth and reproduction of mollusks and algae populations that create drag on the hull of a ship. Found globally, especially in harbor sediment where ships were traditionally scraped and repainted, it slowly leaches out from the hull. Organotins are considered to be “among the most hazardous pollutants known so far in aquatic ecosystems.” [20] TBT is so difficult to manage because it lingers in deep harbor sediments in anoxic conditions and is easily stirred up by storms or dredging. Every time this occurs local organisms are re-exposed. As is always the case when chemicals are introduced into complex living systems the long term effects of organotins on aquatic ecosystems, or their increasing concentrations in the food web, have yet to be fully understood or appreciated.[21]

A 1995 study, which looked at fish from local markets in selected Asian and Oceanian countries, concluded that the presence of butyltins was extensive. This was attributed to “ship-scrapping activities, antifoulant sources and sewage disposal…in those countries.” [22] The authors suggested that because fish was a low percentage of the Indian diet the exposure to unacceptable levels of butyltin was probably unlikely but, “the intake of fish from highly contaminated areas may approach the proposed limits.” Of note also was the reference to the association of butyltins and immune suppression in mammals. [23]

The occult nature of these toxic materials - the fact that asbestosis takes time to show symptoms and that other hazards are not readily apparent, increases the risks to shipbreakers and challenges their ability to live safely. In the tangled, jumble of recycled and reclaimed materials; workers at Alang have set up housekeeping. Not much more then shelters, these dwellings were created with leftover, unusable scraps from the

breaking yard. *Ships of Shame*, a 1999 Danish film, portrayed the lifestyle, health and safety risks of Alang's 40,000 shipbreakers. Most of the workers were men and older boys, from neighboring villages, who came to work in the yard in order to support their families back home. Poor sanitation practices, limited fresh water sources and a transient population were highlighted as additional burdens on the people of Alang. While the tone of the film was somewhat dramatic, the pictures spoke for themselves. Children fished for dinner alongside the rusting ships. There were sorted piles of every imaginable kind of scrap material, literally for miles, and shops to accommodate people who came from all over Gujarat to buy cheap goods. Their village looked like a huge dumpsite.[24]

Dilip D'Souza, a native Indian columnist who visited Alang in 2004, declared it just that, "If this is Asia's largest shipbreaking yard, this must be the world's largest garage sale. Or garbage sale." He mentioned carpets, bathroom stalls, mirrored cabinets, crockery, sofa sets, mixers, fans, videotapes, pumps, and machinery, "all off the ships." [25]

Little has changed for shipbreaking workers over the years. This is true not only in India, but in the breaking yard of Chittagong, Bangladesh. Fine art photographs of Chittagong, taken in 1989, 2001 and 2005, by three different photographers, reveal almost identical conditions. Aside from artistic nuances and coloration, the pictures might have been taken the same year by the same photographer. The breaking yards at Alang look enough like Chittagong that one would be hard pressed to differentiate the two in photographs. Images of giant hulls lolling in dark tidal mud and large groups of men reducing them to small scraps through sweat and strain are the stark reality of shipbreaking. All three artists captured a sense of the archaic nature of shipbreaking and the intense physical labor that has made it possible. Hand tools and portable acetylene

torches are still used to tear apart ships. For protection, workers wear only scarves, rubber boots, and occasionally hard hats.[26]

Without safety regulations or worker's compensation there has been little to no recourse for injured workers. Accidents have been frequent, debilitating and often deadly. Still, local business tries to promote the idea that change has occurred. In a 2001 interview with *The Hindu Business Line*, the vice-chairman and CEO of Gujarat Maritime Board (GMB), Mr. P. N. Roy Choudhury, discussed the improvements made at Alang. "We have brought down the incidents of accidents from 60 in the previous year to only 18 in 2000-2001 and that of deaths from 30 to 16 in the same period." For a business that reported a net of $500 million (currency not listed) annually in the previous few years, the death of even one man because of inadequate safeguards is too high a price for workers to pay.[27] In D'Souza's 2004 column, he noted many, many men with broken arms and the ironic "safety signs and pep-up–the-troop's slogans," as well as dozens of "Monthly report of Hazardous Waste" signs with nothing written on them. These signs should have a list of the hazardous wastes that are present in a ship at the yard.[28]

Despite the blank signs, dealing with toxic waste is commonplace in shipbreaking. TBT is still actively being utilized in some sectors of the shipping industry, but with growing opposition and pressures to find a safer substitute. Legislation to restrict and eventually prohibit the use of TBT has been met with resistance and concern by some in the shipping industry. Ironically, the argument against banning TBT outright is environmental. In a 2001 opinion piece, Johnny Eliasson of Stolt-Nielsen Transportation Group, Ltd, in Houston, Texas, questioned the efficiency of replacement products for TBT. He claimed that the extra drag on hulls from aquatic organisms would require the

use of more fuel to keep ships on schedule, and the consequence would be wasted oil resources. [29] In the shipping industry, the worn phrase “time is money” is a hallmark of business practices.

According to the International Maritime Organization’s (IMO) “International Convention on the Control of Harmful Anti-fouling Systems on Ships,” by January of 2008, ships must either stop using these products, or apply a coating that helps contain the anti-fouling layer from leaching out. Many economically and culturally diverse countries belong to the IMO and as with any organization involving multiple players and interests, that consensus was difficult to accomplish.[30]

The situation at Alang was created by, and continues to be complicated by, a similar layering of the disjointed regulations and objectives of the shipping industry, international law and the Indian government. [31]

Created at a United Nations conference in 1948, The International Maritime Organization became a reality in 1958. Its job was to “ensure safety at sea and the protection of the marine environment.” [32] At that time, international ships were still owned by traditional European States. Since then, significant changes with “open registries” and increases in ship-owning States have occurred. Because the IMO is not an enforcing body it cannot control the apparently common substandard business practices engaged in by many shippers, nor can it pressure countries to comply with environmental standards.[33]

The Organization for Economic Co-operation and Development (OECD) paper titled “Regulatory Issues in International Maritime Transport,” discusses conflicts and discrepancies between formal regulations and commercial practices in the management of

international liner and bulk shipping services. One salient point noted is that these two categories of the shipping industry have been the least regulated. [34] For the years 1997 through 1999, bulk carriers were consistently among the top two vessel types to be scrapped by volume. [35] That some of these ships made it to a breaking yard without clearly indicating the presence of hazardous waste is entirely possible. In many cases a ship cannot be adequately "pre-cleaned" of these substances because "the bulk of hazardous materials…form an integral part of the vessel and its engines," which it needs to legally travel to, and beach itself on, a breaking yard.[36]

One of the subheadings in the OECD paper is "International safety and environmental regulations," and this references the growing "polarization" between States that have high environmental and safety standards and those with "different priorities and realities." These differences were attributed to either the economic limitations of a lesser developed country, or to the fact that they are offshore registries.[37]

While the IMO has agreed on best practice standards for all its members, some countries have more stringent national laws. The U.S. Oil Pollution Act of 1990 required new oil tankers to have double hulls in order to trade in the U.S. "exclusive economic zone, i.e. within a 200-mile limit of shore." [38] Double hulls are meant to protect American shores and waters from another oil spill like the *Exxon Valdez* disaster. The definition of "new" ships here refers to those "ordered after June 30, 1990 or delivered after January 1, 1994." [39] Internationally, there is also a single hull oil tanker "phase out" that was ratified by 130 countries on April 5, 2005. This means that close to 200 ships will be slowly phased out according to a schedule based on category, class and age of the vessel. This also means 200 potentially hazardous ships sent to a shipbreaking yard. [40]

International environmental law involves some of the most complex legislation and negotiation, particularly in relationship to hazardous waste.[41] The UN looked at global issues of hazardous waste at The Basel Convention in 1989, and created a treaty called "The Basel Convention on Control of Transboundary Movements of Hazardous Wastes and Their Disposal." Once again, because of the divergence of international interests, only 33 countries initially signed it. This number increased though, and by 1995, over 100 countries were parties to the treaty. [42] Enforcing the treaty is another matter. A 2001 article on international law and the transportation of toxic waste reports that there is still no one to oversee or "police" limitations at the international level. The biggest concern is the transfer of this waste from developed to lesser-developed countries, allowing them to bear the environmental strain in order to reap the economic benefits.[43] The shipbreaking yards of Alang are the quintessential example of this type of "transfer," but India bears some responsibility in this as well.

India's government is parliamentary and various ministers oversee different areas. The Ministry of Commerce manages international trade. The Ministry of Environment and Forest manages issues related to the environment. As noted by one author in 2004, "there is an absolute disconnect between the two policy-making bodies, highlighting the lack of importance of environmental issues in economic policy design." [44] She looked at the effects trade liberalization had on Indian environmental policy, and concluded they were negative. In other words, the economy is growing at the expense of the environment. [45]

This discussion has focused on the traditional practices of shipbreaking in Alang, India and the overwhelming evidence that proves the industry is not safe or healthy for

workers or the environment. The obvious conclusion is that it needs to drastically change, if not stop altogether. On the other hand, this is a convoluted problem and there are strong arguments against such a simplistic answer.

In "The Global Restructuring of the Steel Industry" author Anthony P. D'Costa writes that," The availability of scrap is a direct function of the level of industrialization." [46]As a developing nation, India needs metal and scrap materials to provide progressive growth for the country, and viable work for her people. A 2002 report noted that over 10% of scrap for industry came from the shipbreaking yards.[47]

In total, from February 1982 to January 2005, Alang had processed 4,135 ships, an average of 180 ships per year.[48] Thousands of workers at Alang, and the over 100,000 people supported by the shipbreaking business, would be hard pressed to find other employment if ship volumes went down.[49]

Ships need to be broken somewhere. Environmental laws and regulations in most of the developed world have made local shipbreaking too costly, not to mention the rich fodder it provides for legal cases brought by activist groups. As the final deadline for the elimination of single hull oil tankers draws closer, a place must be found to dispose of them, but to think globally the world must realize that "away" no longer exists. [50]

The model of building ships, "from cradle to cradle", so that its components can be recycled and reused by the initial manufacturer, is a possible solution. However, there is limited infrastructure in place at Alang which could translate shipbreaking into ship building. [51] This forward thinking by the authors of *Cradle to Cradle* is still applicable to shipbreaking though.[52]

If companies began with the premise that "just as it is not viable to poison local water and air with waste; it is equally unacceptable to send it downstream, or to ship it overseas to other, less regulated shores," environmental consideration in business practices would change. Many of the social and environmental problems visited on developing nations by already developed countries might also change.[53]

Ultimately, "the right thing for this place," be it Alang or the earth, must "be an integration of economic, biologic, and human systems in order to create a sustainable and interdependent method of commerce that supports and furthers our existence."[54]

Addendum: Future Research

Recent newspaper articles detail the legal challenges to ships headed for breaking yards in both India and Bangladesh. [55] Change seems to be in the wind for Alang, but is it in the best interest of her citizens? Throughout this research paper, it was often difficult to discern the *true* impacts of shipbreaking on the people of Alang, because most sources did not consider the local perspective. The loudest voices denouncing shipbreaking practices come from Greenpeace. While they do an adequate job of bringing social and environmental injustice to the world's attention, the white noise of activist politics can make it hard to hear what it is that people and places really need.

Current statistics for Alang show that 4,268 vessels have been broken there, for a total LDT of 30.50 Million MT. [56] So, from March 2002 until March 2006, close to 660 ships, totaling 3 Million MT, found their way into India's economy. But those figures are on the decline according to an April 28, 2006 article in the Chicago Tribune, which states that "the numbers tell the story of a dying industry." While 40,000 workers broke 361 ships in "the fiscal year that ended in June of 1999," only 196 vessels came to Alang by June 2005, and since the beginning of 2006 only 33 ships have been beached there. The number of shipbreaking workers has decreased to "about 3,500." [57]

Local shipbreaking yard owners blame this on pressure from Greenpeace and other environmental NGO's, as well as "higher taxes and competition from …Bangladesh and Pakistan." [58] This amounts to another "race to the bottom," because "national regulations are absent in these countries." [59] In 2003, local Alang businessman Pravin Nagarsheth, predicted just this sort of scenario to author William Langewiesche, and relayed his economic concerns for Alang, because "There was evidence…that some of

the biggest shippers had begun quietly to shy away from India entirely and to direct their ships to more discreet beaches." [60]

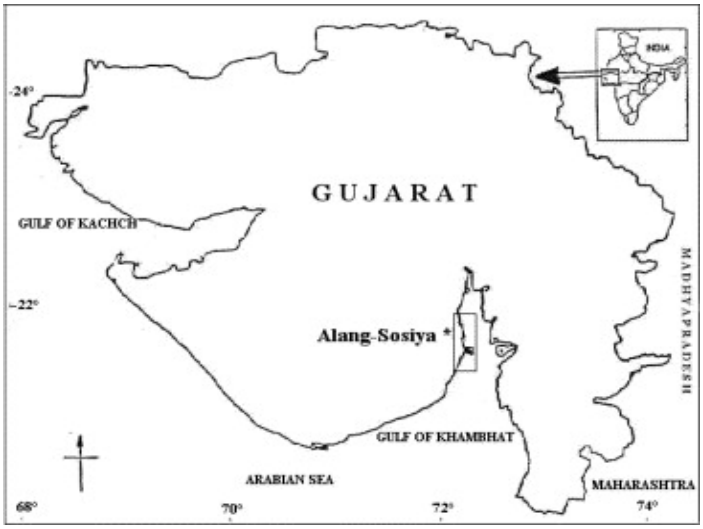
In 1996, the United Nations Educational, Scientific and Cultural Organization (UNESCO) created the Environment and Development in Coastal Regions and in Small Islands (CSI) platform. It is an interdisciplinary approach to dealing with resources and concerns in coastal regions and small islands. Multiple papers from a number of 2003 studies at Alang can be found at <http://www.unesco.org/csi/pub/papers3/alang3.htm>. These surveys looked at the socio-economic and natural systems affected by the shipbreaking yard, in particular seeking out local common knowledge about pre-yard conditions. The strong social framework of the CSI papers reveals important local data to consider in looking towards a hopeful future for Alang. [61]

When we ask the question "what is the right thing for this place", surely the best answer has to be…ask the people who live there!

Appendix I

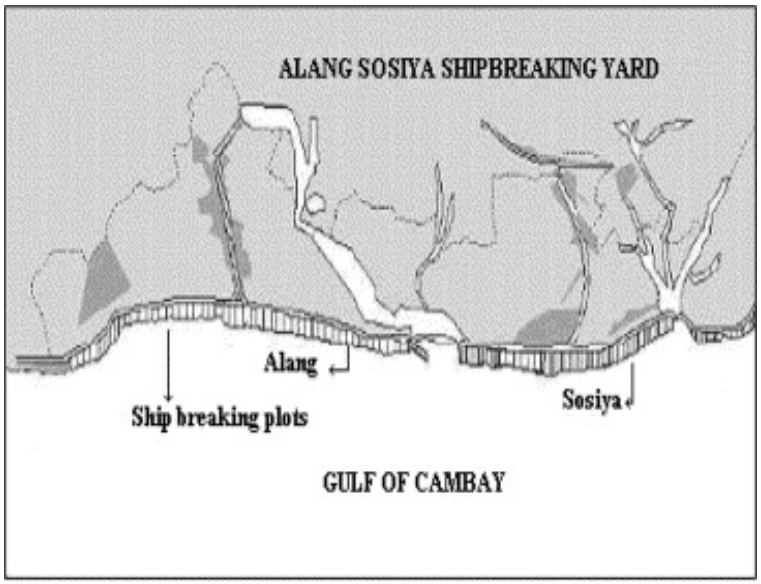
Map of Alang, India

Alang is located on the northwest coast of India in the state of Gujarat.



(Reddy, Sriniwasa et al. 2005)

Warm waters from the Arabian Sea flow into the Gulf of Khambhat and wash along the sandy shore. The 42-foot tidal range of the Gulf makes it easy and inexpensive to run scrapped ships on shore during full moon high tides.



(Reddy, Sriniwasa et al. 2005)

By 2002 there were 185 shipbreaking plots spread along 7 miles of beach here.

Notes

This paper grew from a research assignment in Dr. Michael Kucher's course, "A Natural History of Garbage" (TEST 332, Spring 2005), and two subsequent academic presentations – "The UW Undergraduate Conference on Globalization: *Empire and Extremism in the Age of Uncertainty*" (January 6th, 2006) and "The UW Undergraduate Research Symposium" (May 19th, 2006). Ongoing research for the paper occurred during Independent Studies in Winter 2005 and Spring 2006. The author gratefully acknowledges Dr. Kucher's continued enthusiasm and unwavering support of this endeavor.

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