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Shipwrecking: A Threat to Environment and Human Security

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Abstract

Ships have a long life but when they become unusable or are no longer sea worthy, they are dismantled at Shipwrecking yards. Ship breaking yards provide the last resting place for the ships. Every year around 600 ships come to these yards. Ship breaking is a type of recycling involving breaking up of ships for scrap. Most ships have a lifespan of a few decades before they become uneconomic. Dismantling one large vessel can require removing several tons of hazardous wastes including persistent organic pollutants such as mercury, lead, polychlorinated biphenyls, and asbestos. It is a complex process that involves many environmental, labor, safety and health issues. Developed countries have closed down such yards but developing countries haven't done so because cheap labor is available there and the governments don't pay enough attention to the safety and protection of their environment. India has two shipwrecking yards-at Mumbai and Alang: Alang being the largest in the world. Despite protests from environmentalists these yards are still functional and provide sustenance to many who face health hazards, willingly, in order to live.

Keywords: *Ship Breaking yards, Alang, Pollution, Human security, Environmental security*

Introduction

When a ship is built it has a limited life (approximately 30 years) and when it gets over it has to come into the graveyard to be laid to rest for ever. Out of approximately 45,000-50,000 ocean going ships about 700 are taken out of service every year. Most of the ships completing their life and coming to the ship breaking yards were launched in service in 1970's , the time when many hazardous substances used in their construction were still not banned. Ships, upon whom depends a country's most of the international and major part of national trade do not lose their importance even after death. They remain useful and are wrecked/ dismantled or broken to salvage whatever can be recycled. Wrecking of ships in itself is a big, profitable industry though hazardous, and provides employment to a large number of people.

In the contemporary age of liberalization and globalization international trade is on the increase and major part of this trade is carried out and is dependent on ships. In fact how strong a country is in terms of economy as well as defense can be assessed by the strength of its shipping industry.

Today one need not emphasize upon the importance or role played by shipping industry in a country's development as we all are more or less aware of it. But, there is a lesser known part related with the shipping of which there is a general lack of awareness. And it is ship wrecking industry.

Initially all major sea powers had their own ship wrecking industries. But with the progress of time awareness increased, it was found that this industry is a not only a major source of pollution and contamination of coastal waters but is

also a threat to human health and well being. Developed countries, one by one closed down their ship wrecking industries. The USA and European countries were the first to close down their ship breaking yards, Taiwan and Korea stepped into their place but soon enough realized the environmental damage this industry caused and junked the dirty work. The place vacated by Korea and Taiwan was grabbed by the poor countries, India, Pakistan, Bangladesh and China [1]who vied with each other for the business the industry brings to them and ignored already lax environmental rules and laws related to human security. In view of money and employment generated by the hazardous industry protests by Greenpeace the international movement for the safety of environment were also ignored.

Now only a few countries in the world remain that have still not banned this industry in their territories and such countries are led by India and Bangladesh, two over populated, developing countries of the world where despite opposition this industry is flourishing for the simple reason that workers in this industry will die, either due to hunger or due to illness caused by the hazardous work of the industry. It is any body's guess that people would prefer to die with their bellies full or even partially full rather than die in good health but hungry.

Alang Shipwrecking yard

Alang used to be a pristine beach before the shipwrecking started here in 1983 when MV Kota became the first ship to be brought and dismantled here. . This beach is 10 miles long and the long gentle slope of the embankment and a huge variation in tide levels are the reasons for Alang's beach working so well for scrapping of ships. Ships are brought on shore during high tides, when they can easily glide on the water and sit on the sand, when the water subsides. Then the process to break them starts. The Gujarat Maritime Board, which oversees Alang, has told Greenpeace that 372 workers have died there since the ship-breaking industry was first developed in 1982. But Greenpeace and the International Federation of Human Rights say, based on worker interviews, that the number could be as high as 50 to 60 deaths a year, where approximately 50,000 workers are employed. Started in 1983 with merely 46 plots now as the biggest yard in the world it boasts of 183(at Alang and Sosiya) plots of which 150 are engaged at the height of the activity. Compared with only 5 ships broken at Alang in 1983, a record number of 488 ships were broken here in 2012. From 1982 until 2009 it had already achieved the honor of breaking 5,000 ships.

Providing employment to about 50, 000 people (who are mostly migrant labor from poor states of Bihar, UP, Rajasthan, West Bengal, Orissa), out of which on an average 60 die every year. It is responsible for a 5, 000 crore demolition market that produces 3.5 million tonne of re-rollable steel (10 percent of India's steel requirement) per year and generates 10,000 crore a year in terms of money. Surely for a poor country that is facing a high rate of unemployment the industry is lucrative enough to ignore health and environmental hazards, protests by civil society and international NGO's. This money minting yard has turned the pristine beaches into most polluted and toxic stretches on the coast of India.

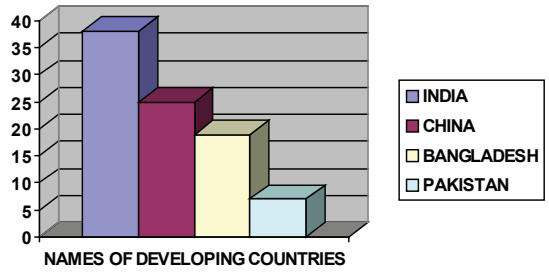
Breaking of a ship

When a ship reaches on its last journey to a wrecking yard, its final resting place, in stark opposition to the fanfare with which its maiden journey is launched the captain salutes it and leaves it without looking back and the ship wrecking company takes over. It takes about a month to break a ship.

To begin with all the removable items are sold as second hand goodies that have a large market, often in hospitality industry, then come the factory owners who buy heavy duty diesel generator sets, welding equipment, turbo chargers, oil purifiers and other stuff. And, after that actual breaking of the ship starts. As also health hazards for the workers involved in the process of ship wrecking. First of all oil tanks are emptied, fuel is pumped out and resold, remaining sludge is often dumped on the ground and burned, sometimes this left over oil causes fires and even results in

deaths. During cutting of the ship involves the danger of being burnt and falling down the high ladders resulting in deaths. Dismantling one large vessel can require removing several tons of hazardous wastes including persistent organic pollutants such as mercury, lead, polychlorinated biphenyls, and asbestos. It is a complex process that involves many environmental, labor, safety and health issues. The main developing countries where shipwrecking is carried out are as follows-

Percentage of Shipwrecking done in these Developing Countries



Hazards involved in ship breaking

All old ships contain hazardous substances like asbestos, lead paint, heavy metals and PCB's. Depending on the size and function of the ship scrapped ships have an unladen weight of between 5,000 to 40,000 tonnes, 95 percent of which is steel, coated with between 10 to 100 tonnes of paint containing lead, cadmium, organotins, zinc and chromium. A ship can have up to 7.5 tonnes of various types of asbestos, several thousand liters of oil(engine fuel, bilge oil, hydraulic and lubricant oils and greases. Tankers additionally hold up to 1,000 cubic meters of residual oil[2]. All these substances are banned in Europe and other OECD countries , are defined as hazardous under Basel Convention but being transferred to ship breaking yards of non OECD Countries without any effective check. While breaking ships workers are exposed to toxins like polychlorinated biphenyls (PCB's), asbestos, lead, waste oil and tributylin (TBT) that results in a number of illnesses.

Asbestos and Asbestosis

In olden days, asbestos was used in the construction of ships and when such ships come for dismantling, asbestos has to be removed first. Asbestos is well known for its potentially lethal effect on people. Asbestos is particularly used in engine rooms, for its thermal insulation and fire-resistant properties. It is sandwiched between steel plates in the walls and doors. When it is broken down into fine fibers , it can hang on in the air suspended for long periods. When inhaled, these fibers can lead to fatal diseases like lung cancer, mesotheelioma and asbestosis. Most of the symptoms of these diseases do not show up for many years and thus make the treatment difficult.

Almost one in every six workers dismantling old boats at India's Alang shipyard suffers from asbestos poisoning. It is a form of lung infection (cancer kind). When workers deal with asbestos they suffer from this disease. It has been well established medically that asbestosis kills. 16 percent of the workers at Alang suffer from an early stage of asbestosis - an irreversible lung condition that could lead to lung cancer.

Waste containing polychlorinated biphenyls (PCB's) at a concentration level of 50 mg per kg or more are also hazardous. Since 1982, production of PCB's has been banned in the developed countries , but they are use din solid form in gaskets, insulation material and electrical components. They are used in liquid form in transformers, capacitors and in oil for electric motors and hydraulic systems.

PCB's are persistent chemicals and they bio-accumulate. Exposure could occur through inhalation, ingestion or skin absorption and can lead to several adverse health effects, including cancer.

Metals of particular concern associated with the ship breaking industry are toxic heavy metals such as lead, mercury and cadmium. These are biologically non essential metal that can cause harm to human health or the ecological system.

A ship's pipe and tanks contain oil and sledge from the fuel and lubricating oils. Oils and fuel poison marine organisms and soil the environment, threatening natural resources. Oil and fuel are toxic for humans as well and can be inhaled or

consumed through contaminated fish or water. They can also lead to fire and explosions. It is usual for waste oil to be burned as it cannot be sold, or it can be dumped into the sea. Similarly ballast water, which is initially and intentionally brought on board to adjust the rim and stability of the ship and contains pollutants is dumped into the sea. When such ballast water is brought from other countries it may contain aquatic organisms that can threaten the ecological balance in the waters where they are released and can in turn affect the human beings.

Lead accumulates in the blood and bones after inhalation or ingestion. It can cause anemia and is toxic to the nervous system and kidneys.

Arsenic exposure can result in lung, skin, intestinal, kidney, liver and bladder cancers. It can also damage the blood vessels. Inflammation of nervous tissue caused by arsenic can result in loss of feeling or paralysis. Disfiguring growths may also appear on the skin of exposed human beings.

Chromium obtained in some chrome based chemicals (chromates) can cause eczema and respiratory disease in people exposed to dusts and fumes, including cancer of the lung.

Organotins (TBT, TBTO, TBTCL) are nerve toxins that accumulate in the blood, liver, kidneys and brain. TBTO is acutely poisonous and genotoxic.

PAH's (polycyclic-aromatic hydrocarbon compounds) can cause various cancers including cancer of the lung and of the scrotum. Some PAH's can combine with genetic material (DNA) causing cell damage and mutations. Exposure can also suppress the immune system.

Dioxins are potent carcinogens and suppressers of the immune system and are accumulated in body fat tissue. In addition they are suspected of pre natal and post natal effects on the nervous system of children. In animal studies they have been shown to reduce sperm production.

Not only asbestosis but other diseases like lung cancer, skin diseases, ringworm, dysentry, anaemia and HIV etc. are very common among people working in this trade, because of poor and unhygienic conditions.

Lung cancer is a disease of uncontrolled cell growth in tissues of the lung. In the UK, asbestos accounts for 2–3% of male lung cancer deaths. Asbestos can also cause cancer of the pleura, called mesothelioma.

Skin diseases, or dermatoses, include, skin cancer, eczema, psoriasis, acne, impetigo, scabies, sunburn, warts, Skin Tags, fifth disease, tinea, herpes, ulcers, and pruritis. Failure to use proper skin protection (gloves, aprons, overalls etc.) can result in irritation or even poisoning.

Ringworm is an infection of the skin, characterized by reddish to brownish raised or bumpy patch of skin that may be lighter in the center, giving the appearance of a ring.

Dysentery is an infection of the digestive system that results in severe diarrhea containing mucus and blood in the feces. Dysentery is typically the result of unsanitary water containing micro-organisms which damage the intestinal lining.

Acquired immunodeficiency syndrome is a set of symptoms and infections resulting from the damage to the human immune system caused by the human immunodeficiency virus (HIV).

This is why such yards are mostly not functional in developed countries and they had refused 'Clemenceau's' (The French ship) entry into their shipwrecking yards. But India being a developing country and having one of the worlds largest shipwrecking yards at Alang had initially not opposed it. Rather it was looking forward to the big income from breaking her.

Legal framework

Basel Convention, 2004 prohibits export of hazardous waste from OECD (Annex vii) countries to non OECD (non Annex vii) countries. The convention also prohibits the export of hazardous waste to parties that have prohibited the import of hazardous waste. The convention also prohibits the export of hazardous waste exports from a party " if it has reason to believe that the waste in question will not be managed in an environmentally sound manner". Each party is required to prohibit the import of hazardous waste " if it has reason to believe that

the waste in question will not be managed in an environmentally sound manner." All known ship breaking operations in non OECD countries do not constitute environmentally sound management as required by the convention. Consequently, trans boundary movement of ships destined for ship breaking is prohibited under the convention as not constituting environmentally sound management, in addition to the other prohibition provisions such as national import bans.

The Basel Convention aims to protect human health and the environment against the hazards that may result from generation, trans boundary movement, and management of hazardous waste. It has two main pillars:

a. A control system for any movement of hazardous waste and therefore reduction of such waste
b. Environmentally sound management of wastes, therefore minimized waste generation

In addition to this International Chamber of Shipping, International Maritime Organization, international Labor Organization, all are trying to make ship breaking industry more safe and environment friendly. Green passport, polluter pays etc. rules, if applied, can go a long way in making this industry more safe and environment friendly.

Despite all these arrangements ships are often not cleaned before they are sent for scrapping. And this is done by transferring ownership to a non accountable intermediate buyer or dummy through which liability is avoided.

Legal Frame work in India

India has an extensive regulatory framework for ship breaking and it is natural too for the country which became pioneer of ship breaking industry in South Asia where the first ship was brought to be broken up as early as 1912 at Garden Reach near Kolkota and then in Mumbai. In 1979 the Government of India and the Government of Gujarat recognized ship dismantling as a manufacturing activity under chapter 15 of the Central Excise Rules for the purpose of sales tax. It is subject to inspection rules under the Occupational Safety and Hazards Act and the principles of the Indian Factories Ac, 1948, for labor safety and occupational Health. [3]The supreme court of India in 1997 had ruled that the import of hazardous wastes as defined by the Basel Convention into India was prohibited. The central Pollution Control Board in its," environmental Guidelines for ship breaking industries" has declared that," old vessels containing or contaminated with any of the above substances(lead, cadmium, PCB, asbestos) are accordingly classified as hazardous. The customs authority and/or the concerned State Maritime Board should ensure this and issue a certificate to this effect that the vessel is free from the prohibited materials". The ship breaking activity in India is regulated at three levels:

1. Before Anchorage
2. At Anchorage point or on the high seas
3. During demolition

The ship breaker has to book the ship by paying earnest money of 10 percent f the ship's value and only after doing so the ship can be brought for demolition to a national anchorage point.

The customs department makes a first visit to then ship on the high seas to check its inventory. After that surveyors conduct a value assessment of the ship.

The Gujarat Pollution Control Board (GPCB) thereafter examines the ship for toxic material. After a decontamination certificate is issued according to the hazardous Materials and Waste s Rules, 1989. The Department of Explosives issues two certificates," Gas Free for Man Entry" and "Gas Free for Hot Work" which means that the ship can be cut by torches.. Sometimes the Atomic Energy and Radiation Board is also requested to check for radio active substances. In the last Gujarat Maritime Board issues a ' Naked Light Certificate" which certifies that the ship is safe for lighting gas torches. And after checking all other certificates and he plot owner's record of waste disposal issues the beaching permit.

The Gujarat Maritime Board is entrusted with the responsibility to ensure compliance with all ship breaking rules and regulations. It also oversees hazardous waste generation and disposal. It can also cancel the permit if it is not satisfied with the compliance of rules and if it does so a full re inspection of the ship is required.

Today pollution control in ship breaking yards is controlled through:

1. Environment Protection Act, 1986
2. MSIHC and Chemical Accidents Rules, 1989
3. Hazardous Wastes Rules, 2002
4. GMB Rules on Ship Breaking, 2006
5. Factories Act, 1948

Greenpeace

Greenpeace is an international NGO that concentrates on protection of environment all over the world. It has conducted many studies as to the causes of rapid degradation of world environment. In this reference it also carried out many studies on the impact of ship wrecking on environment and people involved in this activity.

It is now accepted that all the toxic substances found by Greenpeace on ships-for-scrap are hazardous wastes covered under the Basel Convention (Convention that establishes rules and regulations for protection of Environment). Prevailing Indian legislation, International law and European Union's regulations expressly prohibit the sending of hazardous ships-for-scrap to Asian countries. Ship breaking and the export of ships-for-scrap are some of the issues that straddle several international fora and agreements. The International Maritime Organisation, the Basel Convention and the International Labour Organisation are names of just a few of them that are doing more important work in this reference. They also try to ensure that the export of ships-for-scrap is no longer used as a loophole to dump toxic wastes on developing countries. Greenpeace opposed the entry of 'Clemenceau' in Indian waters which was taken up by environmentalists in India. Ultimately Supreme Court of India gave its ruling on 20 February 2006 and the French government had to call her back.

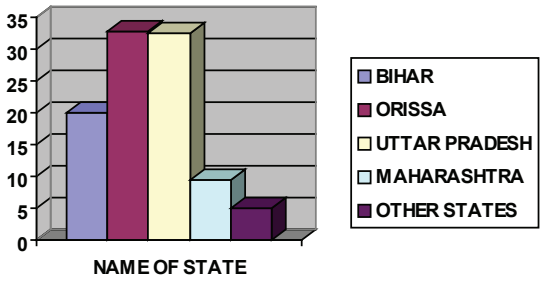
Human and Environment Security

Shipwrecking not only harms human beings but also the environment.

Workers in the ship breaking industries are mainly migrant workers from poorer areas and high concentration of such workers is found mainly in Alang/Sosiya in Gujarat (55000 workers) and Mumbai in Maharashtra (6000 workers) as well as in scrap-handling yards and re-rolling mills in Bhavnagar, Gujarat.

Differentiation between workers

1. Workers Composition From Different States



2. Skill—Highly skilled-03%, Unskilled-34%
3. Literacy—Literate-64%, Illiterate-36%
4. Permanency—Permanent-03%, Temporary-97%
5. Rate of Accidents—Minor- 15-18/ month, Major- 12-15 in a year, Many go unreported
6. Education of Children—Illiterate-09%, Primary-37%, Secondary-38%, Senior Secondary-12%, Higher Secondary and above-04%

Safety Measures

Though environmentalists say that the toxic waste management facilities at Alang are not good enough, it does not even have a hospital[4] to cope with major environmental hazardous ships that contaminate the sea water and coastal areas according to Gujarat Maritime Board following measures are already in place for human and environmental safety.[5]

- Safety Awareness Program

  To bring awareness among the laborers working in the yard, safety indicated banners and posters are affixed in the plots. With about 26 hoardings erected in the yard. Training is also given to the labors by training institute, GMB. Following types of training is provided:

  a. Basic safety for all
  b. Gas cutter training
  c. Asbestos removal training
  d. Basic fire fighting
  e. Master/ Mukkadam Training

- In addition to providing training to workers environmental safety is also being looked after. For this very purpose land fill site for disposal of solid waste has been developed.
- For the proper disposal for toxic and non- toxic material generated from the breaking of the ships, a land fill site has been developed in 7 hectares of land and following facilities have been developed in the first phase:

  a. Asbestos and Glass wool fill
  b. Municipal waste land fills
  c. Industrial solid waste and chemical land fill
  d. Administrative building, internal roads, equipment center and compound wall.

- In addition to all this following facilities are provided by the GMB:

  a. Fire station
  b. Police Station
  c. Post Office
  d. Bank
  e. Telephone Exchange
  f. Hospitals
  g. Community sanitary complexes
  h. Bhavnagar Blood Bank
  i. Red Cross Hospital
  j. Training cum welfare institute
  k. Solid waste Management facility
  l. Light House

- For environmental security Land fill site for disposal of solid waste is being developed. Proper disposal of toxic and non toxic materials generated from the breaking of the ships is to be managed through a land fill which is being developed in 7 hectares of land and following facilities have already been developed:

  a. Asbestos and Glass wool fill
  b. Municipal waste land fills
  c. Industrial solid waste and chemical land fill, and
  d. Administrative building, internal roads, equipment centre, compound walls etc.

Suggestions for improving the living conditions of these workers

(1) Insurance—These workers are poor, illiterate, unenlightened and unorganized. They have no means to secure their and their family's future well being. So the people or the company who own such ships and are paying for the wreckage should be made to provide some sort of health insurance to the workers, either in the form of health or general insurance and if possible, then both.

(2) Application of Laws—To reduce personal hazards, it is advisable to wear protective gears like helmet, goggles, gloves, boots etc. This is mandatory in developed countries but in developing countries like India, this is not done and the workers have to face the consequences. The government should make use of protective gears mandatory and ship owners should be made to provide the workers, protective gears to save their lives and limbs.

(3) Alternative Employment—This activity is done preferably in summers and winters but monsoon time is generally avoided for wrecking a ship. During this time when the people are unemployed, they could be given alternative jobs in some small-scale industries which will give these people a steady income.

(4) Adult Education—People in this trade work for around 180 days only in a year and the rest

of the time especially during monsoon they are jobless. To utilize this time, the government can send some people to teach these workers to increase the literacy. The government is striving for Millennium Development Goals which include poverty alleviation and literacy and a start can be made from here.

(5) Organized Sector—The sector should be organized so that the bargaining power of the people increases and this will make them visible to authorities, employees and society.

(6) Education for Children—The statistics show that not many children of these workers go to higher secondary schools. These children should be provided with better opportunities for continuing their education and encouraged to go in the marine sector as they have been grown beside sea and ships and they could excel in this field.

(7) Training for Olympics/Games—The people working on these ships carry a lot of load staying on a minimal diet and by giving them training and proper diet, they could turn into successful weightlifters, swimmers and divers as they are natural in these activities and have stamina and inclination for such games and can excel in the Olympics and other national and international competitions. This would definitely bring India 2 or 3 gold medals.

(8) Provision of Homes—These workers stay in houses in a congested manner. The land is owned by "The Maritime Board of the Area" which gives it on lease to the workers of the ships. The ship owners should rent homes from this Board for the people who will be working on their ships, instead of workers paying for the shelter themselves.

(9) WHO—the World Health Organization should take initiative to improve the lot of shipwrecking yards in developing countries.

(10) UNICEF—UNICEF can also be approached to help young children of yard workers to improve their health and educational facilities.

(11) Ship design—In future, ships can be designed in a manner which makes use of hazardous material in the minimum possible quantity.

(12) Protective measures—There should be mechanisms for waste management and protection of environment. The sites should be regularly inspected by government authorities. Equipment should be made available to destroy the waste and toxic materials so that no harm is done to the environment.

(13) Eco-friendly design of the ships.

(14) A proper health related register should be maintained—Though Ship Recycling Industries Association (SRIA) maintains a register more often than not their static's do not match with the static's give by various NGO's working in the field. In absence of a proper register and death related documentation grievance redressal comes at a premium.

(15) But above all the government should see to it that hazardous ships do not even have entry into the coastal areas of India—Every ship, being brought for wrecking should be checked by a committee of experts (naval offices who have experience in the making, maintenance and technical knowledge of the ships), and only after this committee has given its nod such ships should be allowed to enter India's coastal waters.

This would also save adverse publicity by international NGO'S (e.g. Clemenceau ship) that accuse India of having not only lax security and environment laws but also of ignoring its human capital and its heath. Even if some of these measures are adopted, it can be hoped that lives of shipwrecking yard workers would be greatly improved.

Ship dismantling policy in South Asia requires the following action at he international, national and local levels[6]

International level and source countries

1. The International Maritime Organization and other stakeholders should implement and develop arrangements under various agreements.
2. Ensure better tracking of ships, including transparency of the source country and ownership.

3. Effectuate the requirement of inventories of material used in ship construction.
4. Assist recipient countries in upgrading dismantling yards and regulatory frame-work.
5. Encourage recipient countries to create a 'level playing field' in terms of environmental regulations and labor conditions to avoid unfair competition.
6. Discourage ship dismantling at locations with sub standard environmental protection and poor workers safety.

National Governments or recipient countries

1. Negotiate a ' level playing field' between recipient countries.
2. Formulate a multi- sectoral policy and strategy to promote better practices in ship dismantling and work towards common objectives.
3. Monitor the status and implementation of laws.
4. Promote unbiased research on the working conditions at yards and the environmental impact of ship breaking.
5. Facilitate transparency and civil society involvement.
6. Help ship breaking yards upgrade facilities.

Local Governments

1. Rationalize and integrate permits to promote compliance.
2. Use revenue from permits for development and infrastructure.
3. Persuade industry that sustainability development makes 'business sense' and reduces risks related to controversy.
4. Facilitate transparency and civil society involvement.

Al said and done ship breaking industry is here to stay, the need of the hour is to implement the laws that have already been passed and accepted at the international, national, and local levels and to enlighten the public to generate support for the civil society who are the watch dogs for the human and environmental security.

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