DUDHNOI COLLEGE

DESSERTATION

FOREST COVER IN GOALPARA DISTRICT AND ITS SIGNIFICANCE . A DATA BASED FIELD STUDY

This Project is submitted to the Dept. of Botany, Dudhnoi College as a partial requirement of B.Sc. (Honours) Degree

SUBMITTED TO -

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Forest Cover of Goalpara District and its significance: A Databased field study

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Gratefully-

Thayonika Sangma

Introduction

There is a growing body of literature that recognises the importance of forests and forest covers because it constitutes a vital segment of the biosphere (Mayaux et al., 2005; Joseph, 2005; Hansen et al., 2010; Potapov et al., 2012).Forests are indeed a highly complex system of a variety of living and non-living things with predominance of trees. Forest is extremely important for natural world as well as human beings. It is the home of much of the world's biodiversity, endangered species and indigenous human cultures. Forest also plays an important role in maintaining global ecosystems and environment at different levels. The multilateral environmental agreements on Climate Change and Biological Diversity clearly reflect the role of forest in the planet's functioning and to the human population (Mayaux et al., 2005).

So far as the Goalpara district of Assam is concerned, it was covered by dense Sal forest (Shorea Robusta) with a variety of wild floral and faunal species extending up to the foothills of Meghalaya to the south. Dr. Hamilton (1814), a British Forest Officer who had visited Goalpara, could not cross the forest at a stage because of its high density along with luxuriant growth of Sal trees. The forests of Goalpara formerly formed parts of the estates of various Zamindars.2 Since the acquisition of these forest areas by Government in 1955-56, considerable portion of the forests were lost due to human habitations and the increasing pressure for illegal occupation through forcible encroachments and other undesirable activities (Deka et al., 2004). Unlike the other parts of the state, Goalpara district has experienced massive degradation of forest due to exploitation of forest species and diversion of forestland for other uses. Since the last century, the forest of the district has undergone continuous degradation due to exploitation of timber, firewood, food, etc. and conversion of forestland for agriculture and settlement. Due to such large-scale deforestation, many valuable wild animals like tiger, leopard, hog deers, bisons, etc. have become extinct (Ahmed, 2007). High population growth and subsequent food requirements, shifting cultivation, illegal timber felling, forest fire, diversion of forestland and encroachment of forestland are mainly responsible to reduce the area of forests in the region even in the Reserved Forest areas.

Before

After

Methodology

The data for the present study has been collected from the divisional forest office, Goalpara, Govt. of Assam. The Primary data and information has been collected from the field observation and the secondary data has been collected from various research papers.

Significance of Forest covers

Forests are our land's trees and plants that cover a third of the earth's surface symbolized by the color green in the common definition of environmentalism. There are many reasons why forests are an important feature for the environment and in our daily lives.They are fundamental life forms and provide for the continuity of the world's biodiversity which is necessary for economic development, diversity of life forms, human livelihood, and environmental adaptive responses.

Forests cover nearly a third of all land on Earth, providing vital organic infrastructure for some of the planet's densest, most diverse collections of life. They support countless species, including our own, yet we often seem oblivious of that. Humans now clear millions of acres from natural forests every year, especially in the tropics, letting deforestation threaten some of Earth's most valuable ecosystems.

We tend to take forests for granted, underestimating how indispensable they still are for everyone on the planet. That would quickly change if they all disappeared, but since humanity might not survive that scenario, the lesson wouldn't be very useful by then. As the Once-ler finally realizes in Dr. Seuss' "The Lorax," a crisis like deforestation depends on indifference. "UNLESS someone like you cares a whole awful lot," Seuss wrote, "Nothing is going to get better. It's not."

Indifference, in turn, often depends on ignorance. So to help things get better for woodlands around the world, we'd all be wise to learn more about the benefits of forests — and to share that knowledge with others. In hopes of shedding more light on what forests do for us, and how little we can afford to lose them, here are 20 reasons why forests are so important.

1. They Help Us Breathe

Forests pump out oxygen we need to live and absorb the carbon dioxide we exhale (or emit). A single mature, leafy tree is estimated to produce a day's supply of oxygen for anywhere from two to 10 people. Phytoplankton in the ocean are more prolific, providing half of Earth's oxygen, but forests are still a key source of quality air.

2. They Are Home to Nearly Half of All Species

Nearly half of Earth's known species live in forests, including nearly 80% of biodiversity on land. That variety is especially rich in tropical rainforests, but forests teem with life around the planet: Insects and worms work nutrients into soil, bees and birds spread pollen and seeds, and keystone species like wolves and big cats keep hungry herbivores in check. Biodiversity is a big deal, both for ecosystems and human economies, yet it's increasingly threatened around the world by deforestation.

3. Including Millions of Humans

Some 300 million people live in forests worldwide, including an estimated 60 million indigenous people whose survival depends almost entirely on native woodlands. Many millions more live along or near forest fringes, but even just a scattering of urban trees can raise property values and reduce crime, among other benefits.

4. They Keep Us Cool

By growing a canopy to hog sunlight, trees also create vital oases of shade on the ground. Urban trees help buildings stay cool, reducing the need for electric fans or air conditioners, while large forests can tackle daunting tasks like curbing a city's "heat island" effect or regulating regional temperatures.

5. They Keep Earth Cool

Trees also have another way to beat the heat: absorb CO2 that fuels global warming. Plants always need some CO2 for photosynthesis, but Earth's air is now so thick with extra emissions that forests fight global warming just by breathing. CO2 is stored in wood, leaves and soil, often for centuries.

6. They Make It Rain

Large forests can influence regional weather patterns and even create their own microclimates. The Amazon rainforest, for example, generates atmospheric conditions that not only promote regular rainfall there and in nearby farmland, but potentially as far away as the Great Plains of North America.

7. They Prevent Flooding

Tree roots are key allies in heavy rain, especially for low-lying areas like river plains. They help the ground absorb more of a flash flood, reducing soil loss and property damage by slowing the flow.

8. They Soak Up Runoff, Protecting Other Ecosystems

On top of flood control, soaking up surface runoff also protects ecosystems downstream. Modern stormwater increasingly carries toxic chemicals, from gasoline and lawn fertilizer to pesticides and pig manure, that accumulate through watersheds and eventually create low-oxygen "dead zones."

9. They Refill Aquifers

Forests are like giant sponges, catching runoff rather than letting it roll across the surface, but they can't absorb all of it. Water that gets past their roots trickles down into aquifers, replenishing groundwater supplies that are important for drinking, sanitation and irrigation around the world.

10. They Block Wind

Farming near a forest has lots of benefits, like bats and songbirds that eat insects or owls and foxes that eat rats. But groups of trees can also serve as a windbreak, providing a buffer for wind-sensitive crops. And beyond protecting those plants, less wind also makes it easier for bees to pollinate them.

11. They Keep Dirt in Its Place

A forest's root network stabilizes huge amounts of soil, bracing the entire ecosystem's foundation against erosion by wind or water. Not only does deforestation disrupt all that, but the ensuing soil erosion can trigger new, life-threatening problems like landslides and dust storms.

12. They Clean Up Dirty Soil

In addition to holding soil in place, forests may also use phytoremediation to clean out certain pollutants. Trees can either sequester the toxins away or degrade them to be less dangerous. This is a helpful skill, letting trees absorb sewage overflows, roadside spills or contaminated runoff.

13. They Clean Up Dirty Air

Forests can clean up air pollution on a large scale, and not just CO2. Trees absorb a wide range of airborne pollutants, including carbon monoxide, sulfur dioxide and nitrogen dioxide. In the U.S. alone, urban trees are estimated to save 850 lives per year and $6.8 billion in total health care costs just by removing pollutants from the air.

14. They Muffle Noise Pollution

Sound fades in forests, making trees a popular natural noise barrier. The muffling effect is largely due to rustling leaves — plus other woodland white noise, like bird songs — and just a few well-placed trees can cut background sound by 5 to 10 decibels, or about 50% as heard by human ears.

15. They Feed Us

Not only do trees produce fruits, nuts, seeds and sap, but they also enable a cornucopia near the forest floor, from edible mushrooms, berries and beetles to larger game like deer, turkeys, rabbits and fish.

16. They Help Us Make Things

Where would humans be without timber and resin? We've long used these renewable resources to make everything from paper and furniture to homes and clothing, but we also have a history of getting carried away, leading to overuse and deforestation. Thanks to the growth of tree farming and sustainable forestry, though, it's becoming easier to find responsibly sourced tree products.

17. They Create Jobs

More than 1.6 billion people rely on forests to some extent for their livelihoods, according to the U.N., and 10 million are directly employed in forest management or conservation. Forests contribute about 1% of the global gross domestic product through timber production and non-timber products, the latter of which alone support up to 80% of the population in many developing countries.

18. They Create Majesty

Natural beauty may be the most obvious and yet least tangible benefit a forest offers. The abstract blend of shade, greenery, activity and tranquility can yield concrete advantages for people, however, like convincing us to appreciate and preserve old-growth forests for future generations.

19. They Help Us Explore and Relax

Our innate attraction to forests, part of a phenomenon known as biophilia, is still in the relatively early stages of scientific explanation. We know biophilia draws us to woods and other natural scenery, though, encouraging us to rejuvenate ourselves by exploring, wandering or just unwinding in the wilderness. They give us a sense of mystery and wonder,

evoking the kinds of wild frontiers that molded our distant ancestors. And thanks to our growing awareness that spending time in forests is good for our health, many people now seek out those benefits with the Japanese practice of *shinrin-yoku*, commonly translated to English as "forest bathing."

20. They Are Pillars of Their Communities

Like the famous rug in "The Big Lebowski," forests really tie everything together — and we often don't appreciate them until they're gone. Beyond all their specific ecological perks (which can't even fit in a list this long), they've reigned for eons as Earth's most successful setting for life on land. Our species probably couldn't live without them, but it's up to us to make sure we never have to try. The more we enjoy and understand forests, the less likely we are to miss them for the trees.

Solmari

Impact of deforestation

Deforestation is one of the major causes to the environmental degradation which is affected by the agents like small farmers, ranches, loggers and plantation companies. There is a broad consensus that expansion of cropped areas and pastures are a major source of deforestation.

The term 'deforestation' describes the complete long term removal of tree cover. The loss forest cover influences the climate and contributes to a loss of biodiversity. The economic

activity is adversely affected by siltation, flooding, soil degradation and reduced timber supplies. Thus, in turn, threatens the livelihood of people.

Causes for Deforestation:

1. Agriculture:

Conversion of forests to agricultural land to feed growing needs of people. There are an estimated 300 million people living as shifting cultivators who practice slash and burn agriculture and are supposed to clear more than 5 lakh ha of forests for shifting cultivation annually. In India, we have this practice in North-east and to some extend in Andhra Pradesh, Bihar and M.P. which contribute to nearly half of the forest clearing annually.

2. Commercial logging:

(Which supplies the world market with woods such as meranti, teak, mahogany and ebony) destroys trees as well as opening up forest for agriculture. Cutting of trees for fire wood and building material, the heavy lopping of foliage for fodder and heavy grazing of saplings by domestic animals like goals.

3. Mining:

This causes environmental impacts like erosion, formation of sinkholes, loss of biodiversity, and contamination of soil, groundwater and surface water by chemicals from mining processes. In some cases, additional forest logging is done in the vicinity of mines to increase the available room for the storage of the created debris and soil.

Contamination resulting from leakage of chemicals can also affect the health of the local population if not properly controlled. Extreme examples of pollution from mining activities include coal fires, which can last for years or even decades, producing massive amounts of environmental damage.

4. Increase in population:

The needs also increase and utilize forests resources. To meet the demands of rapidly growing population, agricultural lands and settlements are created permanently by clearing forests.

5. Urbanization and industrialization:

Since Industrialization and Urbanization needs land to grow, so major amount of forest lands are cut in order to promote Industrialization and Urbanization. This creates harmful effect on environment and forest ecological balance.

6. Construction of dam reservoirs:

For building big dams, large scale devastation of forests takes place which breaks the natural ecological balance of the region. Floods, droughts and landslides become more prevalent in such areas. Forests are the repositories of invaluable gifts of nature in the form of biodiversity and by destroying these we are going to lose these species even before knowing them. These species could be having marvelous economic or medicinal value. These storehouses of species which have evolved over millions of years get lost due to deforestation in a single stroke.

7. Forest fires:

They may be natural or manmade, and cause huge forest loss.

8. Overgrazing:

Overgrazing occurs when plants are exposed to intensive grazing for extended periods of time, or without sufficient recovery periods. It can be caused by either livestock in poorly managed agricultural applications, or by overpopulations of native or non- native wild animals.

Overgrazing reduces the usefulness, productivity, and biodiversity of the land and is one cause of desertification and erosion. Overgrazing is also seen as a cause of the spread of invasive species of non-native plants and of weeds.

Consequences of Deforestation:

Depending on the needs of the social group concerned, deforestation has made it possible for communities to be built. Forest makes way for residential houses, office buildings and factories. Governments are able to built reads to make trade and transport easier and therefore more convenient to residents.

Deforestation can also mean the conversion of forest land to productive land for agricultural uses. This results in better and more abundant production of food and materials, virtually

eradicating periods of want and lack. Economically, deforestation has contributed much in giving many communities the opportunity to make positive changes in their times. Unfortunately, the negative consequences of deforestation for outweigh its positive effects.

Here are few of them.

1. Food problems:

Non suitability of deforested area for conservation. Most of the area that has undergone deforestation is actually unsuitable for long-term agricultural use such as ranching and forming. Once deprived of their forest cover, the lands rapidly degrade in quality, losing their fertility and arability.

The soil in many deforested areas in also unsuitable for supporting annual crops. Much of the grassy areas are also not as productive compared to more arable soils and are therefore not fit for long-term cattle grazing.

2. Exposing soil to heat and rain:

Heavy rainfall and high sunlight quickly damage the topsoil in clearings of the tropical rain forests. In such circumstance, the forest will take much longer to regenerate and the land will not be suitable for agricultural use for quite some time.

3. Flooding:

Deforestation can results to watersheds that are no logger able to sustain and regulate water flows from rivers to steams. Trees are highly effective in absorbing water quantities, keeping the amount of water in watersheds to a manageable level. The forest also serves as cover against erosion. Once they are gone, too much water can results to downstream flooding, many of which have cause disasters in many parts of the world.

The fertile top soil is eroded and flooded into the lower regions, many coastal fisheries and coral reefs suffer from the sedimentation brought by the flooding. This results to negative effects in the economic viability of many business and fatalities in wildlife population.

4. Loss of biodiversity:

This is probably most serious consequence of Deforestation. Put simply, it means the destruction and extinction of many plants and animal species, many of un-home remain unknown and whose benefits will be left undiscovered.

5. Displacement of indigenous communities:

Some indigenous people's may of life and survival are threatened by the loss of forests. Fewer trees results an in secure future for forests workers.

6. Climate change:

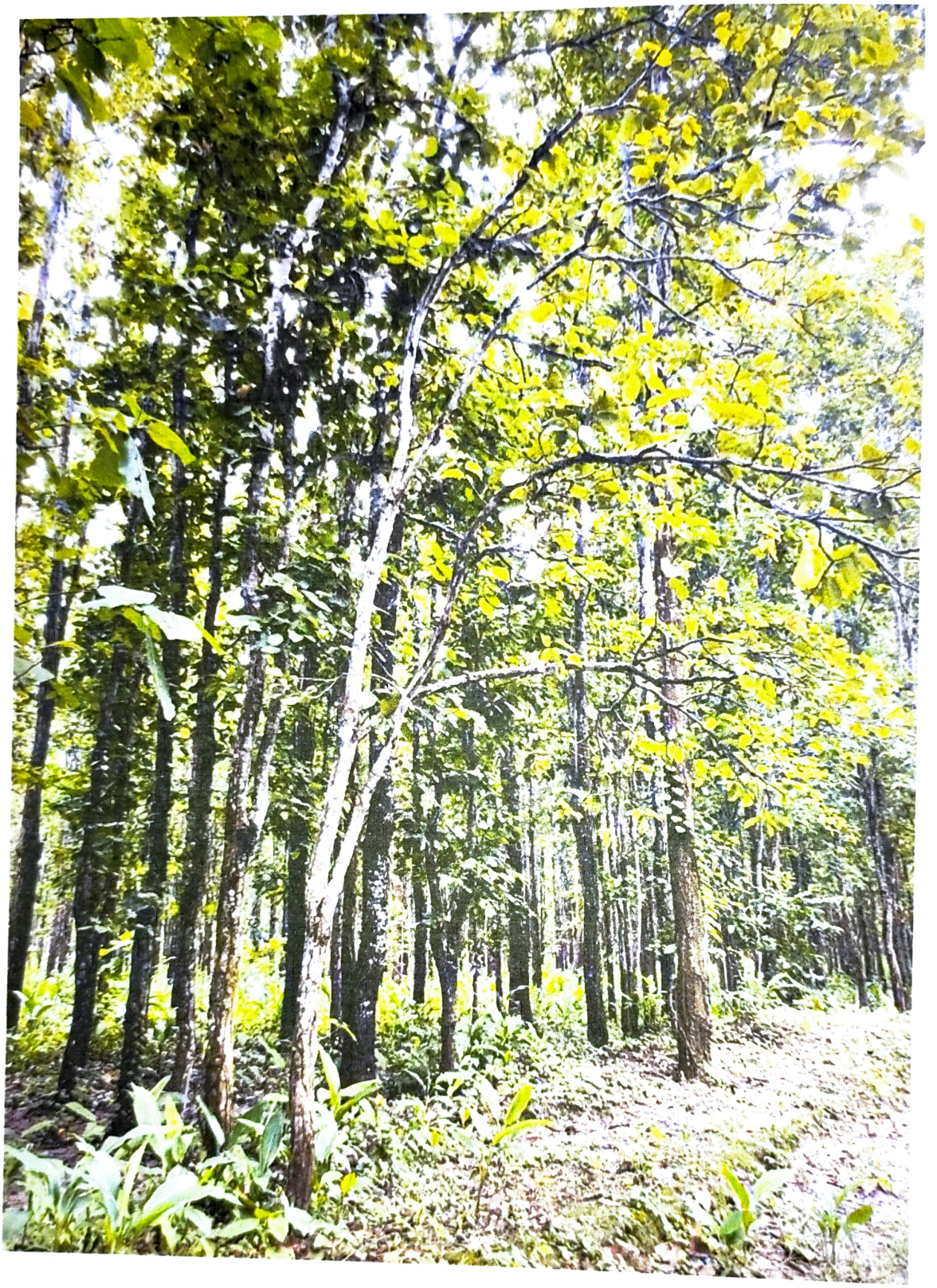
Deforestation can cause the climate to become extreme in nature. It increases CO2 concentration in atmosphere and contributes to global warming.

7. Economic loss:

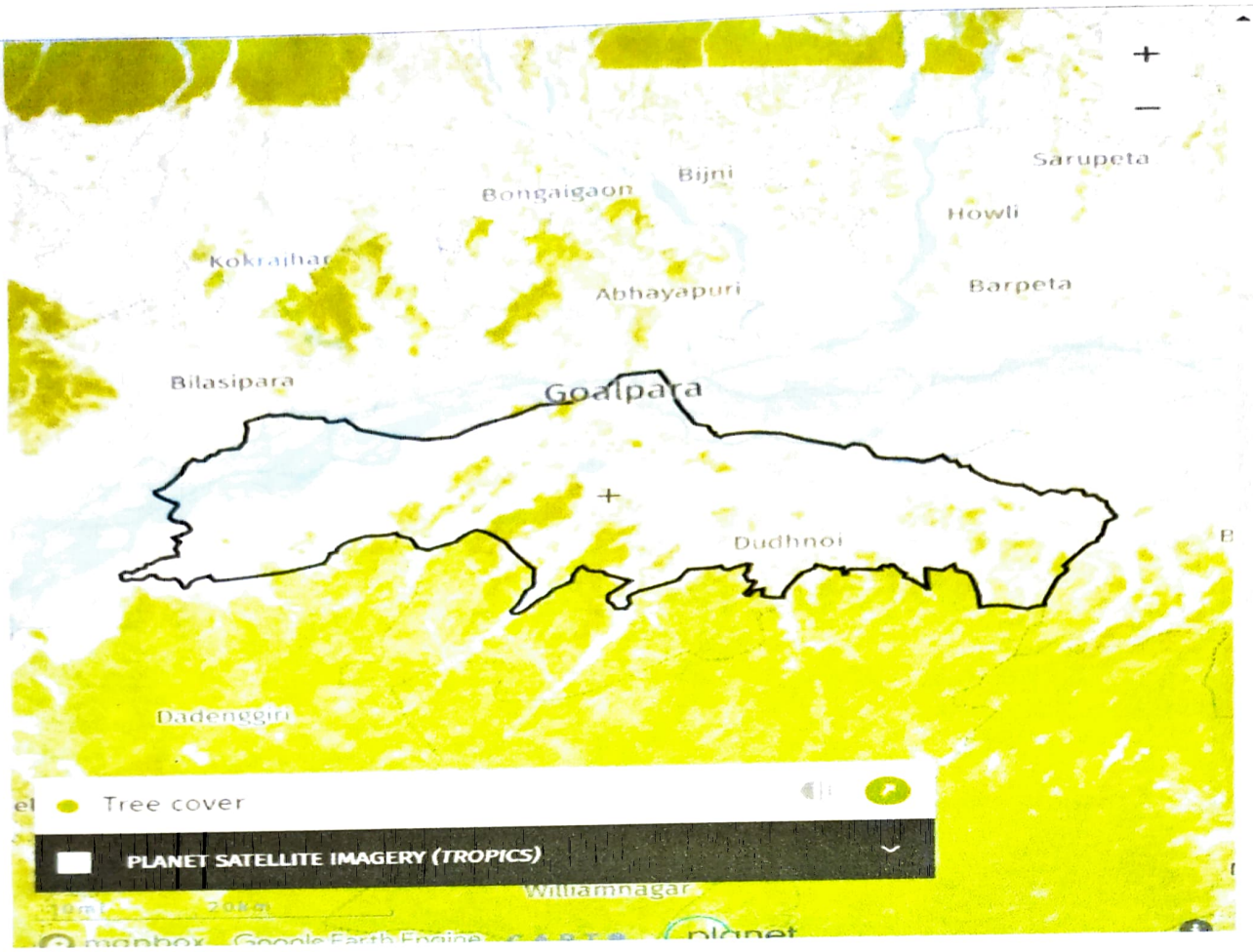
The occurrence and strength of floods and droughts affecting the economy. It also leads to loss of future markets for ecotonism. The value of a forest is often higher when it is left standing than it could be worth when it is harvested.

8. Health issues:

The stress of environmental change may make some species more susceptible to the effect of insects, pollution and diseases.

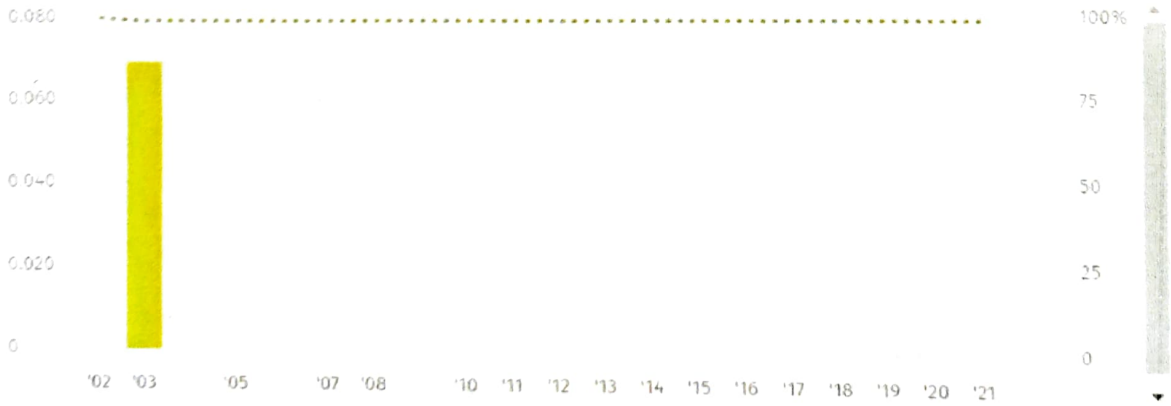


In 2010, Goalpara had 19.8 kha of natural forest, extending over 10% of its land area. In 2021, it lost 7.4ha of natural forest, equivalent to 3.18kt of CO_2 emissions.



PRIMARY FOREST LOSS IN GOALPARA, ASSAM, INDIA

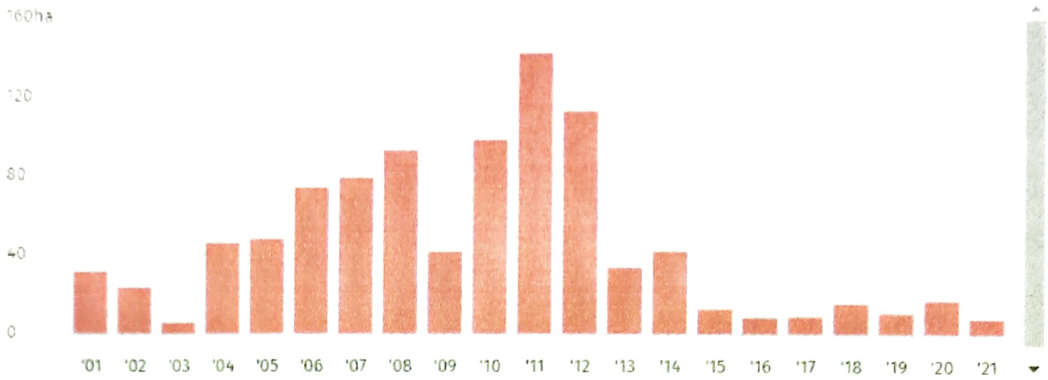
From **2002** to **2021**, **Goalpara lost 0.0693ha of humid primary forest**, making up **< 0.1%** of its total tree cover loss in the same time period. **Total area of humid primary forest in Goalpara decreased by 0.96%** in this time period.



The methods behind this data have changed over time. Be cautious comparing old and new data, especially before/after 2015. Read more here.

TREE COVER LOSS IN GOALPARA, ASSAM, INDIA

From **2001** to **2021**, **Goalpara** lost **950ha** of tree cover, equivalent to a **4.5%** decrease in tree cover since **2000**, and **375kt** of CO_2e emissions.



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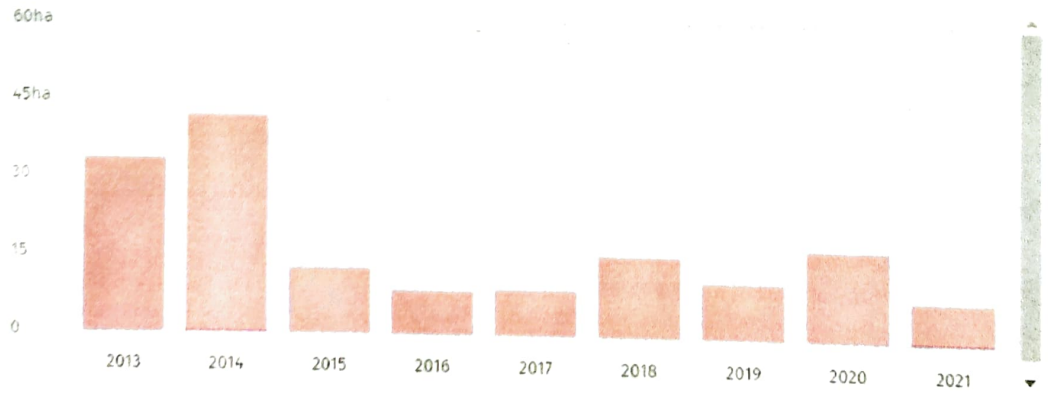
2000 tree cover extent: >30% tree canopy | these estimates do not take tree cover gain into account

FOREST LOSS IN NATURAL FOREST IN GOALPARA, ASSAM, INDIA

From **2013** to **2021**, **99%** of tree cover loss in **Goalpara** occurred within **natural forest**. The total loss within natural forest was equivalent to **62.0kt** of CO_2e emissions.



TREE COVER LOSS IN GOALPARA, ASSAM, INDIA COMPARED TO OTHER AREAS

From **2001** to **2021**, **Goalpara** lost **950ha** of relative tree cover, equivalent to a **100%** decrease since **2000** and **0.33%** of the global total.

19	Baksa	1.14kha
20	Kamrup Metropolitan	1.05kha
21	Goalpara	950ha
22	Chirang	541ha
23	Morigaon	257ha

TREE COVER GAIN IN GOALPARA, ASSAM, INDIA COMPARED TO OTHER AREAS

From 2001 to 2012, **Goalpara** gained **58ha** of tree cover **region-wide** equal to **0.19%** of all tree cover gain in **Assam**.

1	Karbi Anglong	6.96kha
2	Dima Hasao	6.77kha
3	Tinsukia	5.28kha
4	Sonitpur	2.52kha
5	Dibrugarh	1.59kha

>50% tree canopy

Our role in curtailing deforestation

Every day, we use resources that forests provide to us, such as timber, firewood, medicinal and edible plants. Yet if we continue to lose our forests at the current rate, in 80 years from now there will be no forest left on our "green" planet.

Deforestation is happening everywhere on the planet for many different reasons that vary from region to region. Vast areas of rainforests in a number of tropical countries, including Indonesia, Brazil, and Malaysia, have been destroyed to make way for palm oil, soy plantations and cattle ranches. The increasing global demand for wood products threatens many ancient forests around the world, whether it is for paper products, furniture or fuel.

Ending deforestation is the best chance we have to stabilize our climate, save wildlife species and protect our well-being. Protecting the forest is our mutual responsibility, no matter how far away we live from the nearest one. Adopt some of these strategies to help prevent the loss of more trees.

What can we do about deforestation?

1. **Plant a tree**

The most straightforward personal strategy to fight against deforestation is to plant a tree. Planting a tree could be considered a lifelong investment into the environment and your good mental health.

The cutting down of trees causes billions of tons of carbon dioxide (a greenhouse gas) to be released into the air. By planting trees, you are helping to combat global warming because trees absorb carbon dioxide. You are also helping to reduce run off water from the hills. Tree roots prevent landslides and rock slides that sometimes can harm animals, people or damage buildings. Planting and caring for trees is essential for the overall health and quality of life of the community.

Trees are known for their mind soothing and healing properties. Just walking through a forest and looking at the trees calms our mind, alleviates worries and helps tired eyes recover from strain.

You can start by planting one tree, or two, or you can even *plant a whole forest.*

Have you heard the story of JadavPayeng from Majuli Island, India?

The 'Forest Man of India,' as Jadav was titled by the country's former president, has planted a whole forest with his own hands – one tree a day for over 40 years. The resulting 1,400 acres of forest inhabited by rhinos, tigers and elephants are astonishing. Trees also protect the island community from seasonal flooding and land erosion. So, this man has created a whole ecosystem from scratch, sustaining many lives through his consistent effort.

Jadav's story is inspiring, but it's good to know that he is not *the only one*. For example, Antonio Vincente has replanted 50,000 trees on his 77 acres of land in the Amazon rainforest. Similarly, NkomoSikenala is striving to encourage families in Malawi to plant trees around their houses by providing them tree seedlings at reduced cost.

Join these inspiring people and start writing your own story of a life-giver. Plant a tree today.

2. Use less paper

Two million trees are cut every day just to supply the paper demand of the United States.

Globally, 40 percent of all timber is used to make paper products, and the demand for paper increases by two to three percent every year. This means that the paper industry is still consuming more and more trees.

Since the industry has such a high need for wood, it should come as no surprise that some part of the timber originates from illegal logging.

More than 30 percent of wood used by paper mills in Indonesia, one of the major paper producers in the world, comes from illegal sources.

By printing out every email and wasting paper, you are unwittingly spinning the wheel of illegal forest destruction. Reduce your paper use when you can. This way, you will decrease your contribution to the loss of forests.

3. Recycle paper and cardboard

Did you know that one ton (2,000 pounds) of paper put to recycle prevents the cutting of 17 trees? These 17 trees then sequester around 250 pounds of carbon dioxide from the air every single year.

If just 10 percent of all the paper used by the average American in one year were recycled, 25 million trees would be saved. That makes 367 million pounds of carbon dioxide absorbed by these trees in one year.

This means that even by recycling just one paper item out of 10, you are making a difference.

Imagine how many trees you can save and how much good they perform for the quality of our lives by recycling all your paper.

4. Use recycled products

You may have noticed a little label "made from recycled paper" on your new notebook. The same label can be found on many other daily use items like books, paper bags, egg packaging and even toilet paper.

By choosing items made from recycled paper, you make a conscious effort to lower the demand for more timber.

Besides decreasing the need to cut more trees, your purchase is also supporting paper recycling facilities and reducing the amount of waste entering landfills. Therefore, try to purchase your next notebook made from recycled paper and the environment will be very thankful.

The same rule goes for furniture shopping. When buying a new piece of furniture, try to look first for already used pieces. You can often find real treasures for almost no cost. All they need is just a little bit of refurbishing. But this way you can obtain truly unique and personalized pieces for your interior.

For example, the wooden table on which my computer rests when writing this article is bought from a lady who had used it in her office for over 30 years. Few months ago, it has become a centrepiece of our Greentumble office and will remain so for many more years to come.

5. Buy only sustainable wood products

As a consumer, you can help reduce the demand for more logging (especially illegal logging) by ensuring that you only purchase products which are certified by the Forest Stewardship Council (FSC). The FSC is currently the best global standard in forest management, and provides a system for interested parties to work towards responsible forest management.

By purchasing FSC certified products, you are doing two important things:

1. You are ensuring that you aren't supporting unsustainable or illegal logging,

2. You are also supporting companies who strive to produce wood sustainably and respect the rights of their workers and indigenous peoples.

6. Don't buy products containing palm oil

While a small amount of palm oil may be sustainably produced, the majority comes from recently cleared land. Palm oil production has become one of the main causes of tropical rainforest destruction around the world today.

Did you know that palm oil is found in many of the products you buy from the supermarket?

A large percentage of the world's palm oil production comes from Indonesia and Malaysia, where the virgin rainforest is being cleared at an alarming rate of 2.4 million acres a year to make way for new plantations.

Avoiding products containing palm oil might not be easy, because it can be disguised in many different forms in numerous beauty products and food. If you cannot drop some of your favorite products with palm oil entirely, look at least for an alternative that carries a sustainable palm oil certification.

To date, the most rigorous certification process comes from the Roundtable on Sustainable Palm Oil (RSPO), where at least 95% of the palm oil is certified in sustainable practices throughout the supply chain.

7. Reduce meat consumption

To produce the same amount of protein from animal agriculture requires much larger areas of land compared to plant-based farming. For example, nearly one third of the ice-free surface of the planet is converted into pasture for our domestic animals and 30 percent of available arable land is used to grow livestock feed rather than food for our direct consumption.

The global demand for meat keeps constantly rising, but our space to rear livestock does not. That is why animal farming has become one of the leading causes of deforestation in Amazon. Around 70 percent of the Amazon rainforest clearing is done to make way for cattle ranches.

If you choose to reduce the amount of meat you eat, you will lower the global demand for meat and help prevent further destruction of forests to make way for more livestock. Start slowly by replacing one portion of animal protein a week with a plant-based protein like beans.

After all, periods of not eating meat have been practiced by our ancestors for thousands of years – be it because of the meat shortage or religious fasting. In a traditional perception, periods of no meat eating have always been connected with the complete purification of the organism.

8. Do not burn firewood excessively

More than two billion people around the world rely only on firewood to cook and heat their homes . Unfortunately, this often happens in poor areas where already vulnerable forests near villages and towns are cut for fuel well before they can regenerate. Such mismanagement slowly leads to their total disappearance.

For example: The Batán Grande forest in Lambayeque on the north coast of Peru has been declared a nature reserve. One of the key species of the reserve is a tree called mesquite. But despite being protected, more than 2,000 ha of mesquite woodlands are lost every year due to poverty of local people, who fell the trees and burn them at home anyway .

Global forests suffer already a great deal of damage from our excessive consumption, when you want to make a fire in your fireplace, make sure you burn wood from sustainably managed forests that have enough time to naturally regenerate.

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9. Practice eco-forestry

Eco-forestry is a restorative method of forest management, which is not based on economic productivity. In this practice, certain trees are selectively harvested while causing minimal damage to the rest of the forest.

The long-term aim of this method is to systematically fell mature trees, while leaving the forest ecosystem relatively unaffected.

If you own a piece of forest, follow these principles for they will pay you back in the long run more than the profit focused short-term forestry.

10. Raise awareness

Major environmental problems such as deforestation often continue to occur because of a lack of awareness and knowledge about the problem.

By educating people about the effects of their actions, such as palm oil consumption, the amount of deforestation can be reduced. Tell your friends and family about steps they can take to reduce global deforestation or show them this article .

Better awareness and education is important even in the case of farmers. Education of local farmers about optimizing their land management will ensure that less forested areas need to be cleared for farming. After all, farmers are the stewards of our lands.

11. Respect the rights of indigenous people

Although this isn't an issue which is well publicized or widely realized, deforestation destroys the lives of millions of indigenous people. In many remote areas, large international corporations under the cover of corrupt governments intentionally violate the rights of local communities.

The best example of such a mistreatment and disrespect are happening in the Amazon with cattle ranching, or in southeast Asia with the spread of palm oil plantations, resulting often in conflicts and even physical attacks against native people.

But when indigenous people are given equal rights and their traditional lands are respected, the incidence of (illegal) deforestation decreases, as they are able to legally fight for protection of their forests.

For example, Greenpeace published an article about the Cree Nation of Waswanipi land fighting against the large-scale exploitation of the boreal forest in Quebec, Canada. Despite facing enormous pressure from logging companies, the Cree have so far stood their ground and made sure that their pristine forests and cultural heritage remains untouched for future generations.

Respect the rights of indigenous people, help them gain the equal rights and support them when you can.

12. Support organizations that fight deforestation

Numerous international and locally-focused organizations strive to protect forests from deforestation and apply sustainable forestry practices. Examples of some you may have heard of are:

- Greenpeace
- World Wildlife Fund
- Rainforest Action Network
- Rainforest Alliance
- Conservation International
- Amazon Watch
- Arbor Day Foundation and many more.

You can support their efforts by visiting their websites, making donations, or perhaps even participating in their volunteering programs.

13. Join a community forestry project

In 2016, tens of thousands of people in Bhutan have planted 108,000 trees in honor of the birth of the country's new prince. What a wonderful gift to the future ruler, right?

But the message the country has sent to the world had a deeper meaning. Through this act, Bhutan has demonstrated the indispensable power of community in managing natural resources. And community forestry is based exactly on that!

Community forestry is carried out by local residents, volunteers, and schools with the support of the government. This forestry technique involves tree planting, timber harvesting, cleaning, and forest conservation. Through the active involvement in the management of forests, local people become much more aware of all the benefits intact forests provide for them on a daily basis.

Let's look back at Bhutan's example. According to FAO report, 1,664 rural households take care of nearly 3,000 hectares of community forests. Since the program was adopted in 2000, it has improved livelihoods of participating rural communities by:

- strengthening their social bonds,
- regenerating degraded lands,
- purifying and securing water supply,
- providing communities with cheap and local source of fuel.

If you have a chance and time, join a local community forestry project. You may get far more benefits from simply being outdoors with trees and soil than you could ever get from online messaging with your friends.

14. Help restore degraded forests

Restoration of degraded forests is a challenging task that takes decades, and requires careful planning and monitoring. It is not easy, but it is necessary if we do not want to lose all our forests. What is wonderful about forest restoration is the ecosystem's capacity to perfectly recover and give us a new chance to start once again.

For example: In just 50 years a part of a long lost tropical rainforest in Costa Rica was successfully revived. Similarly successful was South Korea's reforestation program that has managed to nearly double the country's forest cover from 35 to 64 percent since 1950s.

Non-profit organizations such as The Sierra Club are working throughout the world to restore degraded forests and return them to their former glory. While this doesn't reduce deforestation directly, it can offset many negative impacts of deforestation on a global scale. Look for such organizations in your area or in the area of your interest and support their activities if you can.

Their work of reversing deforestation is precious for future generations.

15. Fight governmental corruption

Corrupt governments are often payed off by illegal logging companies to ignore their activities. Do not support corrupt politicians and systems. Reduction of corruption will go a long way towards reducing deforestation overall.

In many poorer countries, the lack of police presence and law enforcement means that illegal deforestation often goes unpunished and unnoticed for many years, even though it is destroying the country's economy and resource wealth.

For example: 70 percent of Indonesia's timber exports come from illegal logging. Besides leaving behind extensive damage to the rainforest, the country is also losing around US$3.7 billion every year in lost revenue. Thus, the illegal logging does more harm than good to the country.

Conclusion

Forests and the products they provide are universally required for the continuation of human society as we know it. To change our society to one that does not depend on the forest (to the forest's detriment) and its associated benefits requires such an enormous paradigm shift that we generally do not even consider it worthy of further investigation. Given this situation therefore, it is imperative that we discover mechanisms to manage the forest for all the benefits it can provide, in a sustainable manner.

Few countries have all the answers to all the issues faced, thus there exists a real need for international cooperation. Loss of forest resources transcends national boundaries and affects the entire planet. Given this, the roles of various agencies become vitally important in order to minimise any potential downside and to maximise the upside. Governments, NGOs, intergovernmental panels and the like must work more closely in order to resolve the pressing issues facing the forests. In many cases a collaborative approach will provide a solution which is more acceptable to all parties, and more robust than a solution that is developed unilaterally.

Societies around the world are beginning to face up to the reality that as a species man requires forest resources - both the wood and non-wood products a sustainably managed forest can provide. As the guardians of those resources our performance has to date been abysmal. It is with a great deal of urgency that we must turn that record around and ensure that we have sustainably managed forests for the generations that are to follow. Only a long term global commitment to conservation and sustainable development can reverse the tide of uncontrolled deforestation. A sound policy framework is central to this commitment.

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A

Project Work on

A STUDY ON ETHNO MEDICINAL PLANTS AVAILABLE IN DUDHNOI AND ITS ADJACENT AREAS WITH SPECIAL REFERENCE TO THEIR NEED FOR CONSERVATION

Dudhnoi College

Submitted by

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A Project Work

Submitted to the Department of Botany

Dudhnoi College, Dudhnoi

In Partial Fulfilment of the Requirements

for the Degree of Bachelor of Science

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Meser Ali

Sincerely,

Meser Ali

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I. INTRODUCTION

Plants are the most important and useful sources of medicines. Since the prehistoric period of the time plants are applied as medicines. Ethnomedicinal surveys are significant for close observation of the medicinal practices as well as indigenous knowledge of the ethnic people; have already led to the discovery of many effective and modern drugs (Balic and Cox, 1996 and Cotton, 1996).According to the WHO, about world's 80% of the traditional medicines for healing their primary and common disease (Behera, 2006).The bioactive compounds are available in about 25% of the drugs issued in the USA and Canada that are derived from natural products plants (Farnsworth, 1984). Plant therapy have been used an alternate medicinal system by the day ethno medicine that gets a great popularity that influence in many drugs that are currently in the market (Prance, 1994).Many plants are used as medicines for their therapeutic potential, among these most are less known; those are used by the ethnic people of all over the world on the of their indigenous knowledge.

In our country, the traditional system of medicines plays an important role in health care of rural people for all types of ailments. The healing power of the traditional herbal medicines have been realized and documented since Rigveda and Arthabaveda. Since then plants and their extracts have been used and therapeutically and even today plants based medicines continue to play an essential role in world health care. India has about 45000 plant species and more than 35000 plant species have been claimed to possess medicinal properties and are being used in various human cultures around the world for medicinal purposes. India is country inhabited by a large number of people having diverse ethnic group. There are over 400 different tribes and other ethnic group residing mostly in rural area in India and most of them are still living in the remote forest areas, which depends to a great extended on the indigenous system of medicines. However recently it seems that this type of knowledge on traditional medicine is vanishing from the modern society since younger generations are not interested to carry on this tradition. In, India it is reported that traditional healers use 2500 plant species of plants that serve as regular sources of medicine.

Assam one of the seven states of North-East India has a strong base in indigenous herbal formulations. The composite knowledge persisted within several tribal communities of the state has tremendous scope to deliver the leads for modern therapeutics.

The major percentage of (85%) of the total population of Dudhnoi , Goalpara district of Assam is shared by Rabha tribal communities as- Pati Rabha , Rangdhaniya Rabha etc., (According to their local). Dudhnoi also declared as "Rabha Hasong Autonomous Council" (RHAC) in 2005.

The aboriginal communities of Dudhnoi always prefer natural methods of treating diseases using medicinal plants which are considered to be more reliable in one hand and most of the plants are readily available on the other.Tribals of Dudhnoi living in harmony with nature. These tribals have their own ways to use many plants species against different diseases. Since ancient period, these people have been using plants and plant parts to solve different kinds of diseases such as- bone fracture, kin diseases, reproductive diseases of male and female, fever, jaundice, diarrhoea, dysentery and many other common diseases.

I. MATERIALS AND METHODS

During in this project work collecting medicinal plant species from various place of dudhonoi. After the collections of plant specimen are taken to department of botany for identification purpose. All medicinal plant species was identified by Dr.Dipali Deka, associate professor, department of Botany, Dudhnoi College.

In planning the project work various techniques suggested by different investigators Viz&Jones,(1941), Woodward(1956),Martin(1995) was taken consideration. The medicinal plants mentioned in the list provide immunity against some diseases in the list had enumerated, these plant species in alphabetically sequences, family and then with local name in Assamese(As) and Rabha (Rb) language and dialects, parts of the plants and its traditional use as medicine.

II. ENUMERATION

The medicinal plant species enumerated below which are available in Dudhnoi area;

1. ***Acorus calamus* (Araceae)**
   Local name: As: Bos, Rb: Buchi-sam
   Part used: Rhizome
   Medicinal use: The plant is purgative to the children. The rhizome is also used as an antidote for poison. It is used as a tonic and purgative given to children when dyspepsia is attended with looseness of bowels. Two teaspoon full of the decoction of leaves with bark when taken thrice a day for five days it relieves muscular pain. A smooth paste of whole plant is prepared and mixed with oil extracted from endocarp of fruit of Cocos nucifera L. (oconut oil). The mixture is applied externally on swollen portion of fracture bones and tied with the help of a piece of cloth to rejoin the bone. The rhizome is crushed and the juice is taken for irregularity in menstrual cycle disappears, excessive uterine blooding stops.

2. ***Alocasia cucullata*** **(Araceae)**
Local name: As: Panchamukhi kochu, Rb: Reng- rawana
Part used: corm (Apical portion)
Medicinal use: Apical portion of the corm is boiled with roots of *Solanum ferox* and some small tablets are prepared. Three tablets are taken orally thrice a day in cure piles.

3. ***Alocasia fornicata*** **(Araceae)**
Local name: As: Kola kochu, Rb: Reng-Akkai
Part used: Leaf petiole and corm
Medicinal use: Juice is extracted from the leaf petiole, boiled and externally in sores of ear continuously for few days which cure itching sores of ear. Its corm is burnt in fire and it is boiled hot flesh is taken on the edge of a small stick covered with cotton and applied on tonsils' which help in decreasing pain of tonsil. Also the cooked rhizome is useful in curing painful tonsil. The juice of the burnt corm is useful in healing any kind of wounds. Leaf petioles are also used as an antiseptic bandage. Sap or juice of leaf petiole is applied on area of snake –bite also.

4. ***Alocasia odora*** **(Araceae)**
Local name: As: Dugdha kochu, Rb: Rengnu
Part used: Leaf petiole
Medicinal use: A smooth paste of its leaf petiole is layered externally for few minutes on forehead of a patient suffering from high fever and then temperature gradually decreases. This process also helps in lowering high blood pressure and can enhance sound sleep. Cooked leaf petiole help a woman in increasing strength of the body and uterus after delivery. Cooked rhizome and leaf petiole promotes the production of milk of the mother of a newly borne baby.

5. ***Alocasia macrorrhiza*** **(Araceae)**
Local name: As: Man kochu, Rb: Munleng
Part used: Rhizome
Medicinal used: Some small, pieces are prepared from the middle white portion of the rhizome during the month of February – March and dried completely in the sun light. These dried pieces are powdered and preserved in a dry air light pot. One teaspoonful of cooked powder with fish (*Heteropneustis fossilis*) is given twice a day for seven days for treatment of malaria, typhoid, and some other serious fever. To get relief from diarrhoea, one teaspoonful of dried powder boiled with 2:1 water and milk is taken, its rhizome is used a vegetables which helps in curing cold, headache and muscular pain. Ripe leaf petiole is burnt in fire and its extracted juice mixed with honey (in 2:1 ratio) is orally taken thrice a day to get relief from severe cough and jaundice.

6. ***Amorphophallus bulbifer*** **(Araceae)**
Local name: As:Olkochu, Rb: Reng-ola
Part used: Corm, leaf petiole and root
Medicinal use: Decoction of roots and leaf petiole is applied on burns to get relief. Corm and petiole is edible vegetable. After boiling corm is used as vegetable. The corm is made into paste and tied over the fractured portion as plaster and changed twice a day. It is stated to have the healing property on fractured bone.

7. ***Aloe barbadensis*** **(Liliaceae)**
Local name: As: Sal konwari, Rb:
Part used: Leaf

Medicinal use: The juice of roasted leaves given with honey for cough and cold. The leaves are crushed and the paste is layered on the skin for curing skin burn. It is used as natural skin care basically woman skin care. The juice of aloe Vera its curing mild fever. People are also used the juice of Aloe Vera as tonic for digestive. It may even improved blood, sugar control. It also helps curing from jaundice, if taken it pulp of 2-3 leaves ground with 50 gm talmisri and taken with 250 ml milk for 6-7 days.

8. ***Azadirachta indica*** **(Meliaceae)**
   Local name: As: Neem, Rb: Neemchak
   Part used: Leaf
   Medicinal use: Neem has a remarkable effect on chronic skin conditions. Acne, psoriasis, eczema, ringworm, and even stubborn warts are among the conditions that can clear up easily when high quality, organic neem oil is used. Some time it is also used as pain killer.

9. ***Euphorbia hirta*** **(Euphorbiaceae)**
   Local name: As: Gakhirooti
   Part used: Whole plant
   Medicinal use: Euphorbia hirta is often used traditionally for female disorders, respiratory ailments (cough, corpsy, bronchitis and asthema), worm, and infestation of children, dysentery, jaundice, pimples, gonorrhoea, digestive problems and tumours.

10. ***Tinospora cardfolia*** **(Manispermaceae)**
    Local name: As: sogunilota, Rb: Basanta lewa
    Part used: Stem
    Medicinal use: Traditional Ayurvedic medicine used for ages in the treatment of fever, jaundice, chronic diarrhoea, dysentery, bone fracture, pain killer, asthma, skin diseases, poisonous insecticide, snakebite and also it is used for eye disorder.

11. ***Mirabilis jalapa*** **(Nyctaginaceae)**
    Local name: As: Gadhuli gopal
    Part used: Leaf, root
    Medicinal use: Mirabilis plants may be used as a diuretic, purgative and for vulnary (wound healing) purposes. The root is believed to be aphrodisiac as well as having diuretic and purgative properties. It is also used in the treatment of dropsy. The leaves are reduced inflammation.

12. *Datura stramonium* (Solanaceae)
    Local name: As: Dhatura
    Part used: Leaf and fruit
    Medicinal use: *Datura* is used in the treatment of stomach and intestinal pain that results from worm infestation, toothache, and fever from inflammation. The juice of its fruit is applied to the scalp to treat dandruff and falling hair.

13. ***Houthuynia candata*** **(Saururaceae)**
    Local Name: As: Masondari
    Part used: Leaf

Medicinal use: Its helps cure dysentery, stomach ache, and it is very useful stomach related problems. It helps drying of wound caused by cuts and burns. It is also use folk medicine for dieresis and detoxification and herbal medicine for its antiviral, antibacterial and antileukemic activities. It increase blood in the body prevents heart diseases and strengthen muscles.

14. ***Ocimum sanctum*** **(Lamiaceae)**
Local name: As: Tulosi
Part used: Leaf
Medicinal use: Tulsi is also treat heart disease and fever. Tulsi used to treat respiratory problems. Tulsi is used to cured fever, common cold and sore throat, headache and kidney stones. Tulsi helps in treating asthma and cough.

15. ***Averrhoa carambola*** **(Averrhoaceae)**
Local name: As: Kardoi
Part used: Fruit
Medicinal use: Star-fruits are popular tropical fruits and used commonly in Ayurvedic and traditional medicines in India to relieve ailments such as chronic headache, fever, cough, gastro-intestinal diarrhoea, ring worm infections and skin inflammations. It is said that cure Jaundice.

16. ***Centella asiatica*** **(Apiaceae)**
Local name: As:Manimuni (Dangor)
Part used: whole plant
Medicinal use: Apart from wound healing, the herbs is recommended for the treatment of various skin conditions such as leprosy, lupus, varicaseulers, eczema, psoriasis, diarrhoea, fever, amenorrhea, diseases of the female genitourinary tract and also for relieving anxiety and improving cognition.

17. ***Leucus aspera*** **(Lamiaceae)**
Local name: As: Doron
Part used: Leaf
Medicinal use: The plant is used traditionally as an antipyretic and insecticide. Medicinally, it has been proven to possess various pharmacological activities like antifungal, antioxidant, antimicrobial, antinoceptive and cytotoxic activity. We can use it as digestion juice. Its leaves used as vegetable for many medicinal purposes.

18. ***Justicia gendarussa*** **(Acantheaceae)**
Local name: As: Amar-gach
Part used: Leaf
Medicinal use: *Justicia gendarussa* burm family of Acantheaceae is medicinally important herbs used in the treatments of inflammatory disorder, asthma, hepatic, injuries, and pathogenic infection and also shows ant proliferative activity against various concern cell lines.

19. ***Cyanodon dactylon*** **(Poaceae)**
Local name: As: Dubribon
Part used: Whole plant
Medicinal use: The plants has been long used in the traditional medicines to treat various ailments such as anasarca, convulsions, cough, cramps, diarrhoea, dysentery, epilepsy, hypertension, sores, stomach stones, tumors, urogenitial disorders, warts. Most of the ethnic people it used as cuts wound healing.

20. ***Oxalic corniculata*** **(oxalidaceae)**
Local name: As: Tengesi tenga
Part used: Whole plant
Medicinal use: Plant is anthelmentic, anti-inflammatory, analgesic, astringent, diuretic, febrifuge, relaxant, stomachic and styptic. It is used in the treatment of influenza, fever, urinary tract infection, diarrhoea, cuts injuries, sprains and poisonous snake bite.

21. ***Alternanthera sessilis*** **(Amarantheaceae)**
Local name: As: Matikanduri
Part used: Leaf
Medicinal use: The plants have been traditionally used in the treatment of Jaundice along with other ailments.

22. ***Paederia foetida*** **(Rubiaceae)**
Local name: As: Vedailota
Part used: Leaf and stem
Medicinal use: *Paederia foetida* has been used in folk medicine treatment of inflammation, piles and diarrhoea.

23. ***Andrographis pinaculata*** **(Acantheaceae)**
Local name: As: Chirta
Part used: Stem, leaf
Medicinal use: *Andrographis pinaculata* is medicinal herbs which have many traditional medicinal systems for the treatments of diarrhoea, rabis, flu, leprosy malaria, upper respiratory infection, syphilis, tuberculosis etc.

24. ***Phlogacanthus thyrrsiforms*** **(Acantheaceae)**
Local name: As: Ronga bahok
Part used: Whole plant
Medicinal use: *Phlogacanthus thyrrsiforms* is used in whooping cough and menorrhagi fruits and leaves are burn prescribed for fevers. It is useful for during cough and asthma.

25. ***Justicia adhadota*** **(Acantheaceae)**
Local name: Boga bahok
Part used: Leaves, barks, roots and flowers.
Medicinal use: the leaves, root, flowers and barks of this plants have been used in the treatment of cough, colds, asthma, to likely spectrum as boronchieis and tuberculosis. A number of parts of the plants are commonly used in the forms of decoctions or powders.

26. ***Curcuma longa*** **(Zingiberaceae)**
Local name: As: Haldi, Rb: Holdiya.
Part used: Rhizome
Medicinal use: the turmeric plants used as a traditional medicine and remedy for various diseases including coughs, diabetes, dermatological conditions, respiratory problems, cardio vascular and hepatobillary diseases, arthritis, irritable, bowl diseases, peptic ulcers. It also helps curing wounds.

27. ***Carica papaya*** **(Caricaceae)**
Local name: As: Omita, Rb: Modhu.
Part used: Fruits, roots, bark, peels and seeds

Medicinal use: *Carica papaya* is used for treatment of a numerous diseases like warts, corns, sinuses, eczemas, cutaneous, tubercules, grandular tumours, blood pressure, dyspepsia, constipation, amenorrhoea, general debility, , expel worms and stimulate reproductive organs and many as a results common diseases.

28. ***Costus speciosus*** **(Costaceae)**
Lcoal name: As: Jam-lokhuti
Part used: Rhizome
Medicinal use: Costas plants contain reservoirs of anti-diabetic effects as well as medicinal properties. These plants have been known to demonstrate pharmacological activities such as anti-inflammatory, anti-microbial, antioxidant. The rhizome which widely used in ayurvedic is known to be given patients with pneumonia, constipation, skin diseases, fever, asthma, anaemia, dropsy, cough, urinary diseases and jaundice.

22. ***Bryophyllum pinnatum*** **(Crassulaceae)**
Local name: As: Dupor tenga
Part used: Leaf
Medicinal use: The leaves of B. Pinnatum have a variety of uses the traditional system of medicine in Assam. Its eaten for diabetes, dissolving kidney stones, respiratory tract infections, as well applied to wounds, b oils, and insect bites. It is useful for preventing alcoholic viral and toxic liver damages. It is also used as digestive juice.

29. ***Pogostemon parviflorusi*** **(Lamiaceae)**
Local name: As: Sukloti
Part used: Leaf, roots
Medicinal use: *Pogostemon* plants are antiseptic activity and it useful in the treatment of interitis, eczema and mycotic enteritis.

30. ***Polygonum chinensisi*** **(Polygonaceae)**
Local name: As: Modu soling
Part used: Stem, leaves, root
Medicinal use: This plant has been used in traditional medicine for skin infectious diseases, such as eczema and zona, indigestion, t, and hepatitis, as well as for healing inflammatory wounds or insect stings and snake bites, diarrhoea and various urologic disorders.

31. ***Aerva sangguinolenta*** **(Amarantheaceae)**
Local name: As: Bisalya koroni
Part used: Leaves, root, stem,
Medicinal use: *Aerva sanguinolenta* is used as a tonic, sedative and deranatitis. The decoction from the young branches of the plant used internally against haematuria and irregular or painful menstruation. The roots are used for dysentery and paste of the root is applied externally for headache. Leaves are made in to paste and applied externally for the treatment of cuts and wounds.

32. ***Ichnocarpus frutescence*****(Apocynaceae)**
Local name: As: Dugdhalota
Part used: Leaf, stem and flower
Medicinal use: *Ichnocarpus* is a medicinal plants , given orally to treat dysentery, glossitis, heamaturia, measles, bleeding gums, convubions, cough, delirium etc.

33. ***Marraya koenigii*** **(Rutaceae)**

Local name: As: Narsinha, Rb: Narsingh chak
Part used: Leaf, roots
Medicinal use: In Ayurvedic medicines uses powder dry curry leaf mixed with honey and betel nut juice as anti- periodic. The leaves of this plants are used externally for application into bruises, burns, eruption and treatment of diabetes mellitus,. *Marraya koenigii* is cureently being used as a stimulant and dysentery. It also treatment of poisonous animals bites. They are also use in curing piles, allaying body heat, thirst, itching and inflammation.

34. ***Psidium guajava*** **(Myrtaceae)**
Local name: As: Modhori Aam, Rb: Lame-pocho
Part used: Leaves, fruit and stem.
Medicinal use: Although guava has a number of medicinal properties, it is the most common and popular tradition for gastrointestinal infections such as diarrhoea, dysentery, stomach ache, and indigestion and it is used across the world for these ailments.

35. ***Tegtes petula*** **(Asteraceae)**
Local name: As: Narji phool
Part used: *Tegtes petula* an important medicinal used for worldwide distributed and reported for its folkoric use various disorders like skin, eye problems, injury and stomach issues.

36. ***Aegle marmelos*** **(Rutaceae)**
Local name: As: Bael, Rb: Chipri
Part used: Fruit, Leaves, bark
Medicinal use: Bael is used in the treatment of chronic diarrhoea, dysentery, and peptic ulcers, as alaxative and to recuperate from respiratory affection in various folk medicines.

37. ***Termanalia arjuna*** **(Combretaceae)**
Local name: As: Arjun, Rb: Arjun pan
Part used: Bark, fruit, leaves
Medicinal use: Arjun has been commonly used as a cardiotonic in heart failure, ischemic, cardiomyopathy, atherosclerosis, myocardium necrosis and has been used for the treatment of different human diseases like blood diseases, anaemia, venereal and viral diseases; and to continue excellent healthiness.

38. ***Rauvolfia serpentine*** **(Apocynaceae)**
Local name: As: Shorpogonda
Part used:Leaf, Roots
Medicinal use: Snakeroot is a safe and effective treatment for hypertension. Leaves and roots are crushed with milk and made into a paste and used internally and externally on the snakebite and poisonous insect bite.

39. ***Zingiber officinalis*** **(Zingiberaceae)**
Local name: As: Adha, Rb: Chinku
Part used: Rhizome
Medicinal use: Ginger has been used for thousands of years ago for the treatment of numerous ailments, sush as colds , nausea, arthritis, migraines, and hypertension.

40. ***Clitoria ternatea (*** **Papilionaceae)**
Local name: As: Aparajita

Part used: Leaf, root, flower
Medicinal use: C. Ternatea a traditional Ayurvedic medicine, has been used for centauries as a memory enhancer, nootropic, antisttress, anxiolytic, antidepressant, anticolvulsant, traquilizingand sedative agent.

41. ***Mimosa pudica*** **(Fabaceae)**
Local name: As: Nilaji bon
Part used:Root
Medicinal use: M. Pudica has been used traditionally for ages, in the treatment of urogenital disorders, piles, dysentery, sinus, and also applied on wounds.

42. ***Hibiscus rosa sinensis*** **(Malvaceae)**
Local name: As: Jobha phol
Part used: Whole plant
Medicinal use: All part of hibiscus plants are used traditionally. Due to their soothing and astringent properties, the flowers and leaves have been traditionally used to treat conditions such as cancer and gallbladder attacks, to lower blood pressure, to relieve dry coughs, and topically treat skin afflictions.

43. ***Mentha viridis*** **(Lamiaceae)**
Local name: As: Podina
Part used: Whole plant
Medicinal use: in addition food flavouring agent , mint is well kwon for its traditional medicinal uses, particularly for the treatment of cold, cough, jaundice and digestive problems.

44. ***Catherantus roseus*** **(Apocynaceae)**
Local name:As: Noyon tora
Part used: Whole plant
Medicinal use: In traditional medicine, the periwinkle has been used for relieving muscle pain, depression of the central nervous system, and also to heal wounds.

45. ***Eryngium foetidum*** **(Lamiaceae)**
Local name: As:Man dhonia
Part used: Whole plant
Medicinal use: *Eryngium foetidum* has been used in traditional medicine in tropical regions for burns, fever, hypertension and ashtma

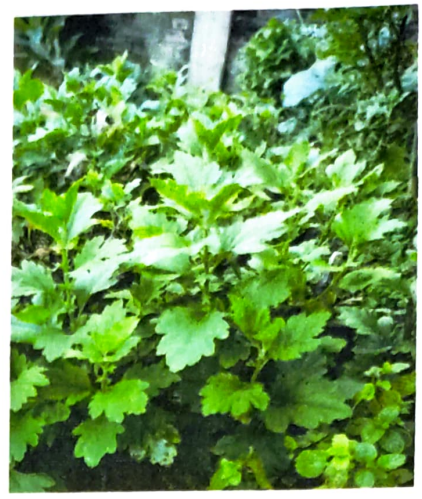
III. RESULTS AND DISCUSSION

The information gathered about 45 plant species have been explained in enumeration. All these belong to 27 families, 45 genera of 45 species. People belonging to Dudhnoi, Goalpara of Assam utilized these plants as popular vegetables throughout North-East India. These plants are used for the treatment of various diseases, like asthma, muscular pain, fever, malaria, piles, sores, diarrhoea, dysentery, uterine trouble, jaundice, diabetes, burns , high blood pressure, cough, bone fracture, headache etc. Some of them are used as antidote, tonic and antiseptic, also used as digestive juice.

Again out of these 45 species, the number species against each specific plants part of different medicinal use are : Rhizome-4, Leaf-10,Bark-2,Whole plant-8,Root-5,Corm-1, Leafpetiole-2,Stem-8,Seed-5.

1

Terminalia arjuna



2

Mentha viridis

3

Hibiscus rosa sinensis

4

Eryngium foetidum

5

Ocimum sanctum

6

Azabirachta indica

7

Justicia gendarussa

8

Curcuma longa

9

Zingiber officinalis

10

Amorphophallus paeoniifolius

11

Alocasia odora

12

Leucus aspera

13

Euphorbia hirta

14

Bryophyllum pinnatum

15

Mirabilis jalapa

16

Catharanthus roseus

Where the some medicinal plant are already been confirmed by Kritiker and Basu (1981), Jain (1991) and Deka (2005).

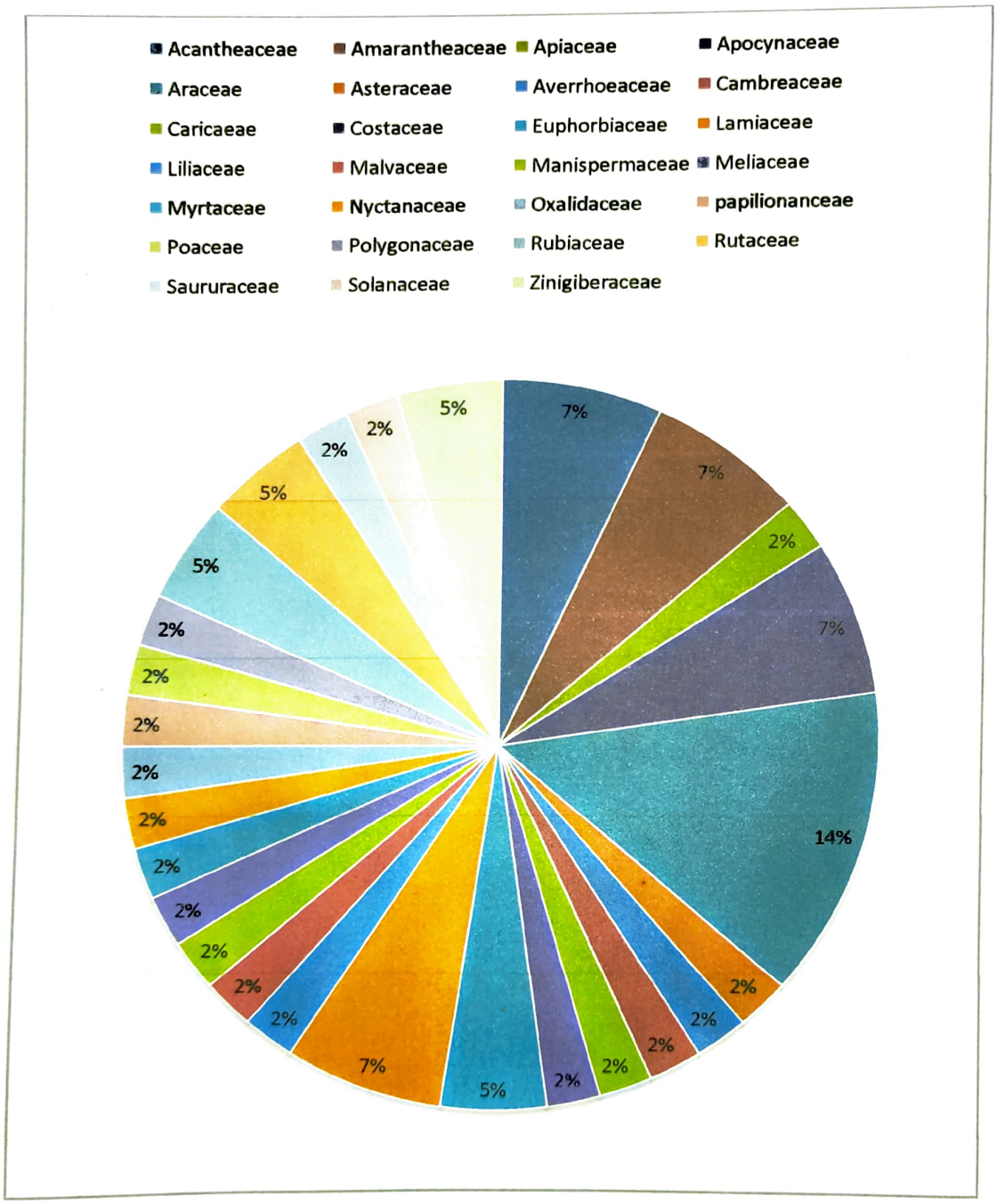


Fig 1: Family wise plant specimens

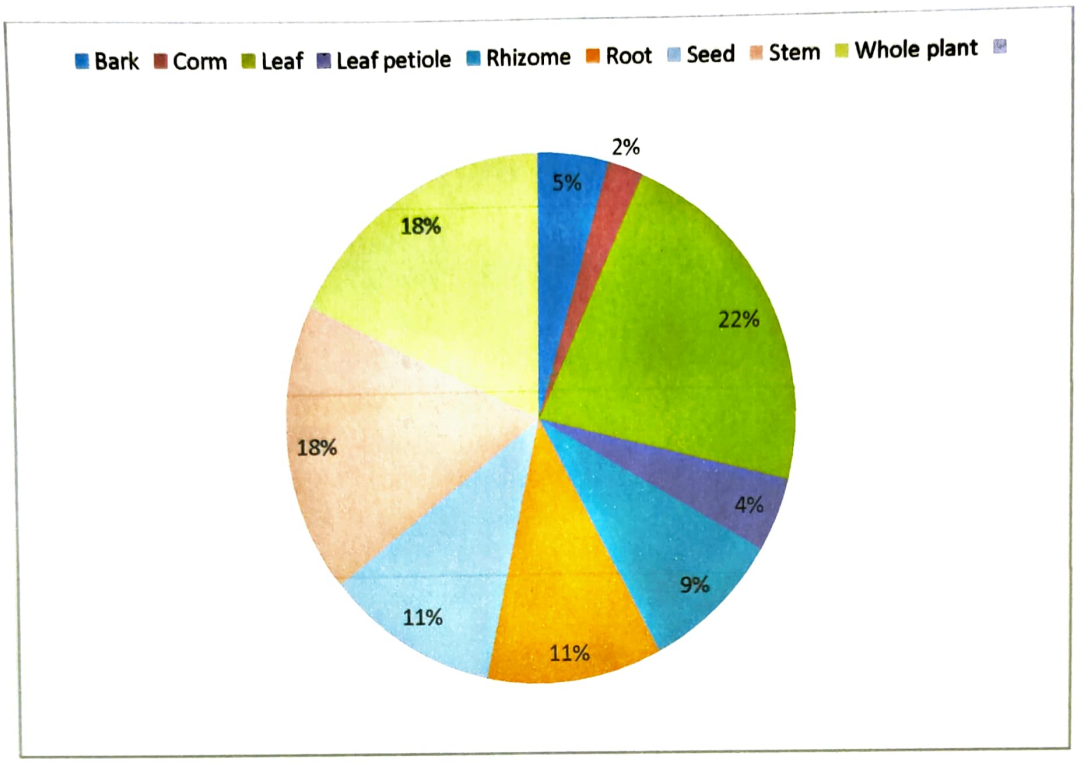


Fig 2: Parts wise distribution in traditional medicinal use

I. CONCLUSION

The people of North –East India (which is very rich in biodiversity) has been using numerous herbs, trees, creepers of therapeutic purposes since time immemorial. Most of the plant species possess high percentage of rapids and are not believe to have medicinal value by the common people. But the tribal people of Dudhnoi, Goalpara district has been using above mentioned plant species for treatment of some particular diseases through generations. Efforts should be made for their conservation in setu and their cultivation should be encouraged through with their extinction can be prevented may also get an expensive remedy. Some plants species are not chemically proved of their medicinal value, but are already been prove traditionally. So which are not proved chemically, it should be done by pharmacological company or any other institute. It is very important for our next generation. In Dudhnoi there have many medicinal plants but all are not used by their people. But some medicinal plants are toxicity for over doses.

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STUDY ON AQUATIC ALGAL DIVERSITY OF DUDHNOI COLLEGE CAMPUS

A project work

Submitted for fulfillment for the Bachelor Degree in Botany (Honor's Degree) to the department of Botany

Dudhnoi College, Goalpara (Assam)

Dudhnoi College

Submitted to
DEPARTMENT OF BOTANY
DUDHNOI COLLEGE
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Mostafizur Rahman

Sincerely,

Mostafizur Rahman

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I. INTRODUCTION

Algae are an extremely diverse group of organism that can be found in almost every aquatic ecosystem on the planet, and they play important and beneficial roles for life on the earth. They serve as the primary source of energy and oxygenate the ecosystem through the process of photosynthesis. The algae are chlorophyll bearing, autotrophic, and aerobic microorganism that fix CO_2 from atmosphere and produce energy from sunlight and synthesize their own food. In total, 40% of global photosynthesis is contributed by algae. Algae considered to be the foremost organisms that respond to environmental changes and nutrient fluctuation. The habitats occupied by fresh water algae are divided into lotic and lentic water types. Algae are placed at the lower rung of evolution and serve as a base model for the origin of land plants.

Algae may be free-floating or they may remain attached to the submerged stones or to the bodies of other plants and animals in water by means of organs of attachment, called holdfasts. Free-floating algae are called '*plankton*', while attached and bottom dwelling algae are called *benthos*. Algae are important in the food web in the terms of primary production, biogeochemical cycling and habitat formation and alteration. In food webs, algae can be consumed by herbivores or decomposed by bacteria. Algal photosynthesis is responsible for the oxygen in every other breath a human takes as well as animals, although admittedly most of that comes from algal diversity.

Some members of algae are associated with other organisms within the tissues of other plants and animals or as symbionts in a symbiotic relation with the host getting mutual benefits without causing any injury. Algae survived even in most harsh habitats by producing novel biomolecules and metabolism pattern. Although in many panel discussion algae are ignored but they contribute maximum in CO_2 sequestration in reducing adverse effects of global warming.

Dudhnoi College is located between latitude 25.9899° N and longitude 90.7841° E in Goalpara. The college presently has campus total land area of 27.45 acres. The college has two ponds, one of which is in front side of the college and second is near the college playground. There is also has small garden pond of department of Botany. The college is surrounded by nature which keep fresh and healthy environment of campus.

This investigation was carried out on two different ponds of the college ponds. This investigation is a humble effort to know the algal genera diversity in Dudhnoi College. This investigation has not been done before in this campus.

II. MATERIALS AND METHODS

Algal samples were collected randomly from two different stagnant water bodies of Dudhnoi college campus. Samples were collected by filtering technique and samples were preserved in water. Collected algal samples were analyzed under compound microscope at department of botany, Dudhnoi college laboratory. Photomicrographs were taken with the help of a digital camera. Identification of algae was done by following standard literature and monographs of Das and Keshri (2016), Gandhi ( ), Desikacahry ( ) and Das and Adhary (2014). . A total 30 numbers of samples are collected randomly from the study area.

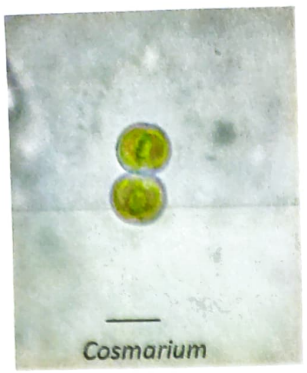
III. RESULTS AND DISCUSSION

During the study perod a total of 33 algal taxa belonging to 6 Phyla, 12 families and 19 genera were identified. One of these 7 genera belong to the family Desmidiaceae, and other each 1 genus are Bacillariophyta familia incertae sedis, Euglenaceae, Naviculaceae, Nostocaceae, Oedogoniaceae, Oscillatoriaceae, Phacaceae, Pinnulariaceae, Scenedesmaceae, Selenastraceae, Spirulinaceae, Zygnemataceae, Bacillariophyta classis incertae sedis. Among all the families, Desmidiaceae have been found to be dominating over others (Fig:1). There was a strong significant difference in algal composition among different ponds.

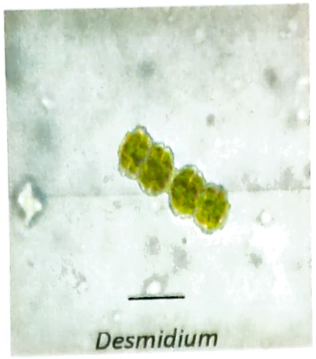
Table 1: Algae of College ponds

Sl. No.	Genus	No. Of Species	Family	Phylum
1	*Cosmarium*	1	Desmidiaceae	Charophyta
2	*Desmidium*	1		
3	*Hyalotheca*	1		
4	*Spondylosium*	1		
5	*Staurastrum*	8		
6	*Staurodesmus*	2		
7	*Xanthidium*	1		
8	*Oedogoniam*	1	Oedogoniaceae	Chlorophyta

9	*Monoraphidium*	**1**	Selenastraceae	
10	*Anabaena*	**2**	Nostocaceae	Cyanobacteria
11	*Oscillatoria*	**2**	Oscillatoriaceae	
12	*Spirulina*	**1**	Spirulinaceae	
13	*Navicula*	**2**	Naviculaceae	Ochrophyta
14	*Pinnularia*	**2**	Pinnulariaceae	
15	*Lepocinclis*	**1**	Phacaceae	Euglenozoa
16	*Trachelomonas*	**2**	Euglenaceae	
17	*Coelastrum*	**2**	Scenedesmaceae	Chlorophya
18	*Spirogyra*	**1**	**Zygnemataceae**	**Charophyta**
19	*Himanthidium*	**1**	Bacillariophyta familia incertae sedis	Bacillariophyta classis incertae sedis


Cosmarium

1


Desmidium

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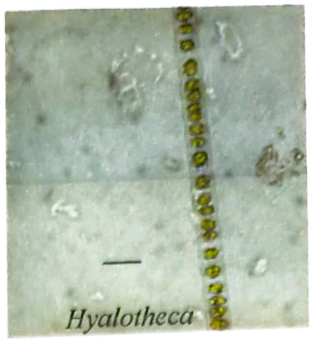
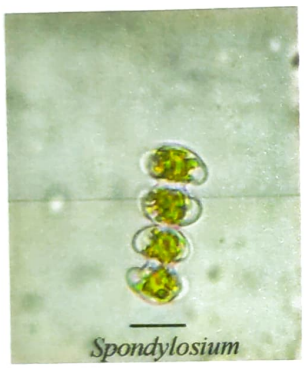
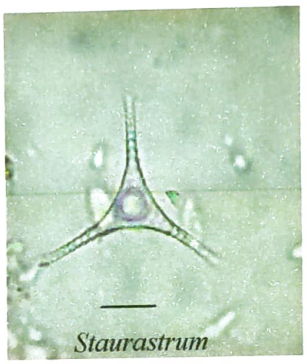

Hyalotheca

3


Spondylosium

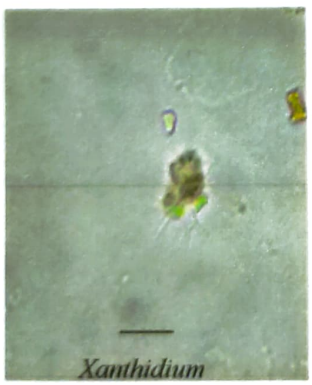
4


Staurastrum

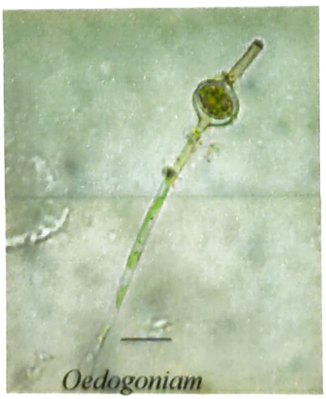
5


Staurodesmus

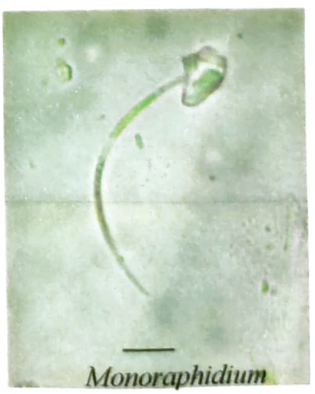
6


Xanthidium

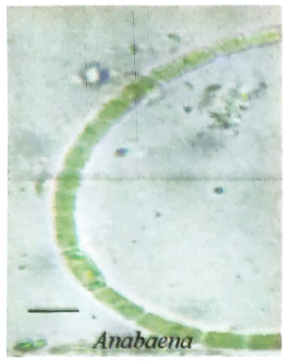
7


Oedogoniam

8


Monoraphidium

9



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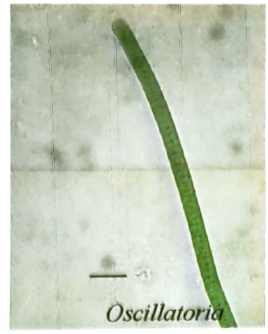

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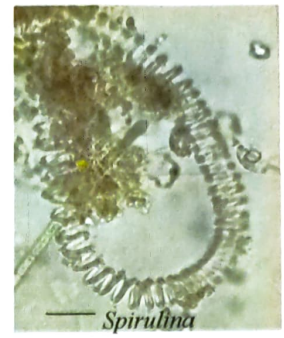

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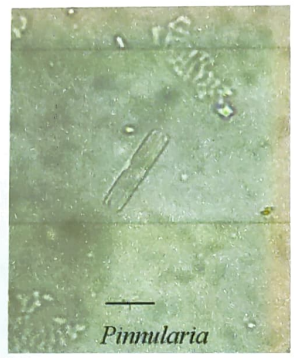

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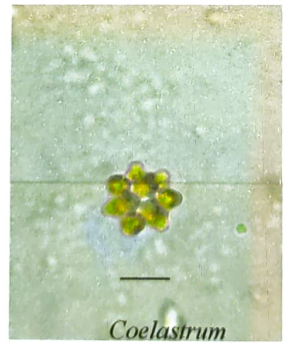

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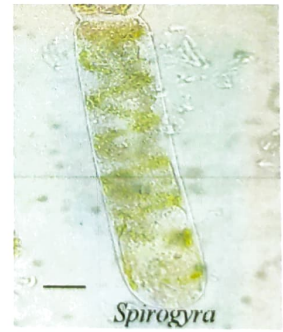

18

Photo plate 1: Identified sample

(*Scale bar = 10μm*)

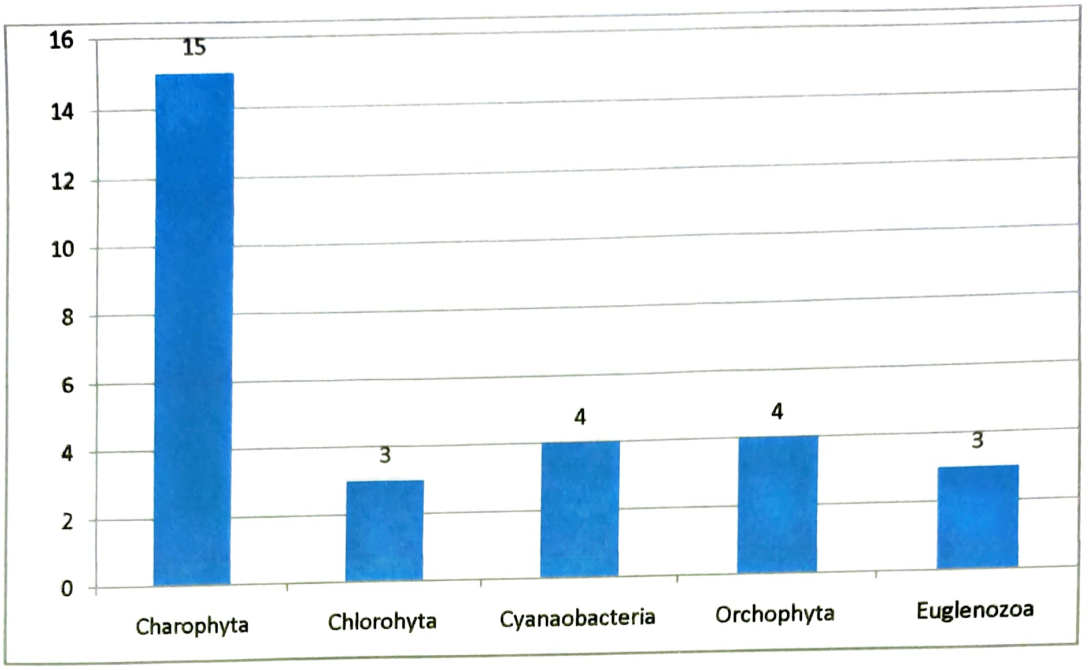

Fig 1: Phylum wise distribution of algal taxa

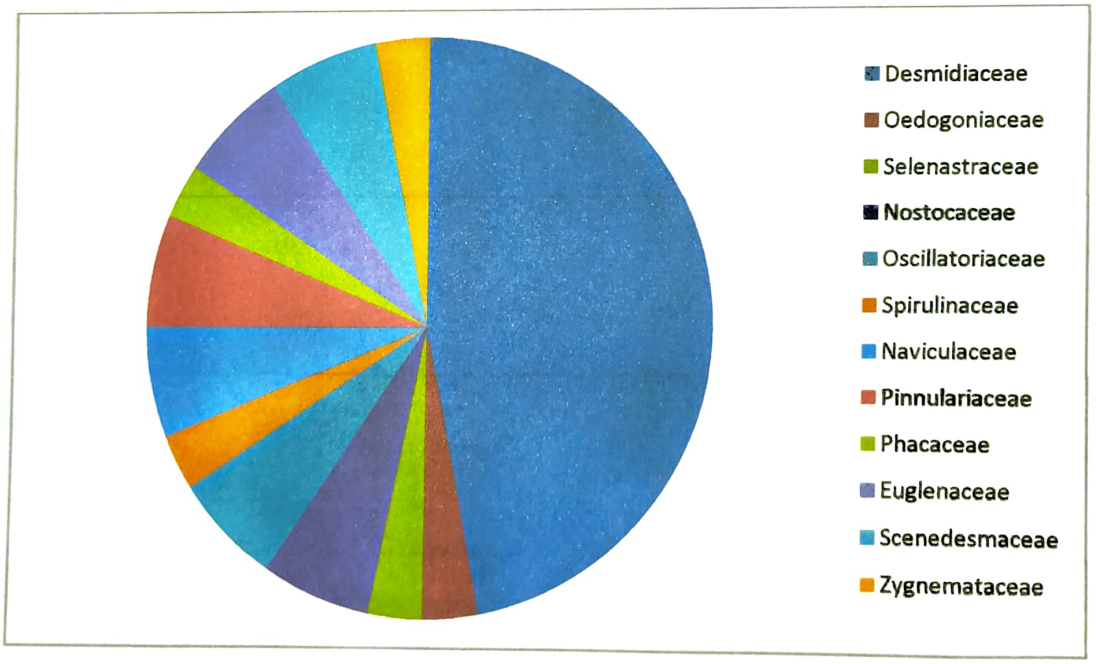

Fig 2: Family wise distribution of algal taxa

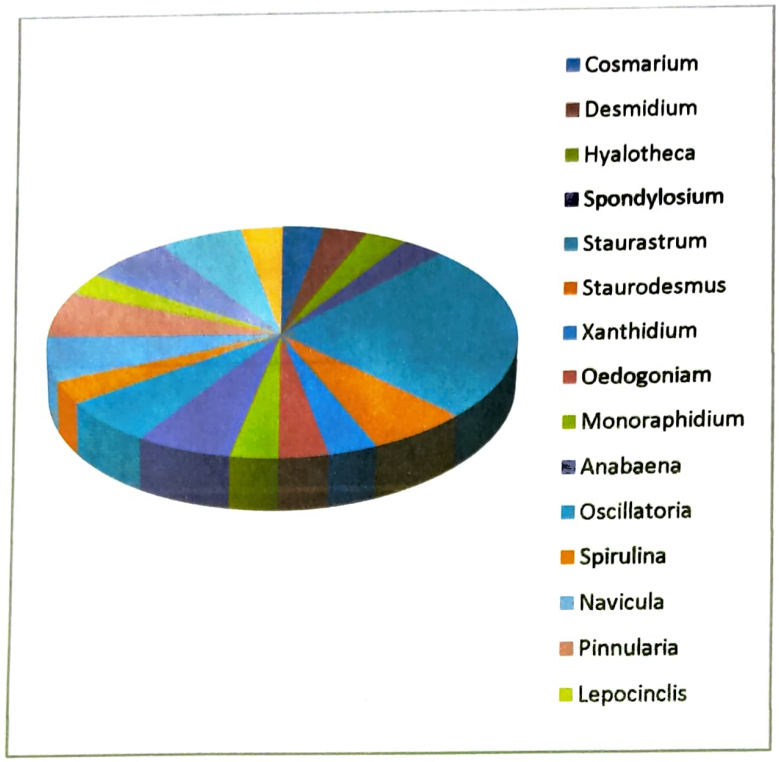

Fig 3: Genera wise distribution of algal taxa

IV. CONCLUSION

The record of 33 algal taxa from the campus ponds showed that the campus is also rich in algal flora. Chlorophyta, Charophyta, Cyanobacteria and other green algae were commonly found in this pond. The ecological variables played a great role in influencing the distribution and diversity of algal communities. The algal diversity, abundance, and composition were all dependent on ranges of rainfall, photon irradiance, and relative humidity. Temperature had least effect on the diversity of subaerial algae. Algae from the basis of food chain for more than 70% of world biomass.

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