UN environment

United Nations
Environment Programme

BACKGROUND GUIDE

Background Guide

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Preface

Letter from the EB

Honorable Delegates,

Welcome to CHMUN 2019! We are pleased to introduce you to our committee, the United Nations Environment Program (UN-EP).

We – Karman, Swasti, Ishita – are delighted to serve you as Chairs of the Environment Program in the upcoming conference and we are sure this will be a time well spent, with plenty of experience to share.

Many of you will be new to Model United Nations conferences, but do not worry: You are in good hands. As Chairs, we will be well prepared and motivated to guide you through the conference process. In order for you to be able to prepare diligently as well, we have written this background guide which gives you an overview of the history and function of the Environment Program itself as well as an academic summary of the two topics as a starting point for you to develop your counties' positions. The topics under discussion for UNEP are:

TOPIC A/ Climate Change Posing Existential Threat to Life

TOPIC B/ Planet's Lungs on Fire

We expect each delegate to come with an understanding of his or her country's contribution in climate change and wild fires and also the willingness of the portfolios to forge agreements.

For your own advancement and profit, but also to ensure a successful and enjoyable working atmosphere in the committee, let us kindly suggest for you to:

1. **... be prepared**: Read through this background guide and take it as a point of departure for your own research into the position your countries take on the issues on the agenda.

2. **... stay in character**: Learn about your country and try to capture the mentality of its rep- resentatives. You do not need to know the answer to every question that might come up. But set some basic goals that are appropriate for your country and try to act accord- ing to them. Find allies that your country would side with in reality too.

3. ... **act diplomatically**: Be respectful towards your fellow delegates and follow the Rules of Procedure. Be diplomatic rather than demanding and try to win over opposition in- stead of forcing your opinion on others.

... **have fun**: Simulating diplomacy should never be taken so seriously that cooperative fun turns into sour competition. Enjoy the debate, get to know people and don't forget: The conference doesn't end when the meeting is suspended.

You all are expected to research, list down possible points of discussion, question and plausible responses and be ready to enjoy the intellectual energy among the group.

We wish you all the best for your preparations and are looking forward to seeing you at the conference!

Sincerely,

Karman S. Bhatia	Swasti Kataria	Ishita Rochlani
Chairperson	Vice Chair	Vice Chair

About the United Nations Environment Programme

The United Nations Environment Programme (UN Environment) is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system, and serves as an authoritative advocate for the global environment.

Our mission is to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations.

"A healthy planet depends on all of us."

Headquartered in Nairobi, Kenya, we work through our divisions as well as our regional, liaison and out-posted offices and a growing network of collaborating centres of excellence. We also host several environmental conventions, secretariats and inter-agency coordinating bodies. UN Environment is led by our Executive Director.

We categorize our work into seven broad thematic areas: climate change, disasters and conflicts, ecosystem management, environmental governance, chemicals and waste, resource efficiency, and environment under review. In all of our work, we maintain our overarching commitment to sustainability.

Our work is made possible by partners who fund and champion our mission. We depend on voluntary contributions for 95 per cent of our income. Every year, we honour and celebrate individuals and institutions that are doing outstanding work on behalf of the environment.

We also host the secretariats of many critical multilateral environmental agreements and research bodies, bringing together nations and the

environmental community to tackle the greatest challenges of our time. These include the following:

- The Convention on Biological Diversity
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora
- The Minamata Convention on Mercury
- The Basel, Rotterdam and Stockholm Conventions
- The Vienna Convention for the Protection of Ozone Layer and the Montreal Protocol
- The Convention on Migratory Species
- The Carpathian Convention
- The Bamako Convention
- The Tehran Convention

Topic A/ Climate Change Posing existential Threat to Life

1. Introduction

Negative consequences of global warming continue to be felt around the world: Rising sea levels threaten island states and coastal regions, while weather extremes and catastrophes occur ever more frequently, and desertification and droughts endanger food supply. Today there is broad consensus among the member states of the United Nations that the rise in global mean temperatures (global warming) is driven mainly by anthropogenic emissions of greenhouse gases (GHG), especially CO2, and that it must be averted because of the devastating effects it would have on natural and social systems if left unchecked.

It is for this reason that in 2016 the international community adopted the Paris Agreement and pledged to undertake all necessary efforts to limit global warming to 2°C until 2100 and, if possible, even to 1.5 °C. Even more than previous treaties addressing climate change, the Paris Agreement is based on equity between fully industrialized countries, emerging economies, developing countries and small island states under the principle of *"common but differentiated responsibilities and respective capabilities, in the light of different national circumstances"*.

This is especially important, because, as the International Panel on Climate Change (IPCC) has underlined in its latest special report, the risks for natural and human systems from global warming *"depend on the magnitude and rate of warming, geographic location, levels of development and vulnerability, and on the choices and implementation of adaptation and mitigation options"*.

Despite these findings and the latest negotiation success at the 24th Conference of the Parties (COP24) to the United Nations Framework Convention on Climate Change (UNFCCC), global car- bon emissions were expected to increase by a further 2.7% in 2018, when compared to 2017 yet another all-time high. As the United Nations Environmental Program (UNEP) presented in its 2018 Emissions Gap Report, a continued GHG emissions path without significant reductions will lead to an increase in global mean temperature of at least 3.2°C until 2100, with the 1.5°C increase being reached as early as 2030.

1.1 Problem

Global climate change has already had observable effects on the environment. Glaciers have shrunk, ice on rivers and lakes is breaking up earlier, plant and animal ranges have shifted and trees are flowering sooner.

Effects that scientists had predicted in the past would result from global climate change are now occurring: loss of sea ice, accelerated sea level rise and longer, more intense heat waves.

Taken as a whole, the range of published evidence indicates that the net damage costs of climate change are likely to be significant and to increase over time.

- Intergovernmental Panel on Climate Change

Droughts in the Southwest and heat waves (periods of abnormally hot weather lasting days to weeks) everywhere are projected to become more intense, and cold waves less intense everywhere.

Summer temperatures are projected to continue rising, and a reduction of soil moisture, which exacerbates heat waves, is projected for much of the western and central U.S. in summer. By the end of this century, what have been once-in-20-year extreme heat days (one-day events) are projected to occur every two or three years over most of the world.

Global sea level has risen by about 8 inches since reliable record keeping began in 1880. It is projected to rise another 1 to 4 feet by 2100. This is the result of added water from melting land ice and the expansion of seawater as it warms.

In the next several decades, storm surges and high tides could combine with sea level rise and land subsidence to further increase flooding in many regions. Sea level rise will continue past 2100 because the oceans take a very long time to respond to warmer conditions at the Earth's surface. Ocean

waters will therefore continue to warm and sea level will continue to rise for many centuries at rates equal to or higher than those of the current century.

The situation is so dire that The Arctic Ocean is expected to become essentially ice free in summer before mid-century.

Climate change is now affecting every country on every continent. It is disrupting national economies and affecting lives, costing people, communities and countries dearly today and even more tomorrow. Weather patterns are changing, sea levels are rising, weather events are becoming more extreme and greenhouse gas emissions are now at their highest levels in history. Without action, the world's average surface temperature is likely to surpass 3 degrees centigrade this century. The poorest and most vulnerable people are being affected the most.

Global warming is likely to be the greatest cause of species extinctions this century. The IPCC says a 1.5°C average rise may put 20-30% of species at risk of extinction. It will cause steep increase in the amount of hurricanes. 1.5 degree increase will cause around 6% insects 8%plants and 4% animals to lose their habitat and if the temperature goes on rising, at 2 degrees 18 % insects, 16% plants and 8 % animals will lose their natural geographic range and may go extinct, most ecosystems will struggle with 2°C increase in temperature.

Many of the world's threatened species live in areas that will be severely affected by climate change. And climate change is happening too quickly for many species to adapt.

Climate change is amplified in the polar regions. The earth's north and south extremities are crucial for regulating our planet's climate and are particularly vulnerable to the impacts of global warming, which has global consequences.

Oceans are vital 'carbon sinks', meaning that they absorb huge amounts of carbon dioxide, preventing it from reaching the upper atmosphere. Increased water temperatures and higher carbon dioxide concentrations than normal, which make oceans more acidic, are already having an impact on oceans.

Oceans are already experiencing large-scale changes at a warming of 1°C, with critical thresholds expected to be reached at 1.5°C and above.

Coral reefs are projected to decline by a further 70-90% at 1.5°C. At a warming of 2°C virtually all coral reefs will be lost. It's not only a tragedy for wildlife: around half a billion people rely on fish from coral reefs as their main source of protein.

HOW FORESTS ARE AFFECTED BY CLIMATE CHANGE

Impacts vary in different kinds of forests. Sub-Arctic boreal forests are likely to be particularly badly affected, with tree lines gradually retreating north as temperatures rise. In tropical forests such as the Amazon, where there's abundant biodiversity, even modest levels of climate change can cause high levels of extinction.

IMPACTS OF DEFORESTATION

When large areas of forest are destroyed it's disastrous for the local species and communities that rely on them. Dying trees emit their stores of carbon dioxide, adding to atmospheric greenhouse gases and setting us on a course for runaway global warming.

CLIMATE CHANGE AND FRESHWATER

Climate change is having serious impacts on the world's water systems through more flooding and droughts. Warmer air can hold a higher water content, which makes rainfall patterns more extreme.

Rivers and lakes supply drinking water for people and animals and are a vital resource for farming and industry. Freshwater environments around the world are already under excessive pressure from drainage, dredging, damming, pollution, extraction, silting and invasive species. Climate change only exacerbates the problem and makes this worse. Extremes of drought and flooding will become more common, causing displacement and conflict.

In mountainous regions, melting glaciers are impacting on freshwater ecosystems. Himalayan glaciers feed great Asian rivers such as the Yangtze, Yellow, Ganges, Mekong and Indus. Over a billion people rely on these glaciers for drinking water, sanitation, agriculture and hydroelectric power.

Contribution of Different Nations towards Climate Change:

According to the IPCC report just 100 companies are responsible for 71% of the world's carbon emission and just 25 of those are responsible for half of the carbon emission. If these companies continue doing what they are doing then there is no chance of saving our earth for a drastic change. The biggest problem is that well to do people sometimes doesn't believe in the sciences or just don't care about the future. The countries that are most suffered are the poor ones who don't even contribute in 30% of the CO2 emission. Here's the list of countries which are top most in producing carbon emissions.

	Country	2015 total carbon dioxide emissions from fuel combustion (million metric tons)	2015 per capita carbon dioxide emissions from fuel combustion (metric tons)
1	China	9040.74	6.59
2	United States	4997.50	15.53
3	India	2066.01	1.58
4	Russia	1468.99	10.19
5	Japan	1141.58	8.99
6	Germany	729.77	8.93
7	South Korea	585.99	11.58
8	Iran	552.40	6.98
9	Canada	549.23	15.32
10	Saudi Arabia	531.46	16.85
11	Brazil	450.79	2.17
12	Mexico	442.31	3.66
13	Indonesia	441.91	1.72
14	South Africa	427.57	7.77
15	United Kingdom	389.75	5.99
16	Australia	380.93	15.83
17	Italy	330.75	5.45
18	Turkey	317.22	4.10
19	France	290.49	4.37
20	Poland	282.40	7.34

International Attempts to Reduce Climate Change:

United Nations Climate Change Conference (COP 24) in Poland, 15 international organizations jointly announced a commitment to make their operations climate neutral. The organizations will measure their greenhouse gas emissions, reduce them as much as possible and compensate the currently unavoidable ones with credible carbon credits. This initiative demonstrates the commitment of the participating organizations to climate action, while serving as inspiration for others to follow suit and contribute to the goal to achieve global climate neutrality before the end of this century, as established in the Paris Agreement which was adopted by international community. The main aim of the Paris Agreement is to keep a global average temperature rise this century well below 2 degrees Celsius and to drive efforts to limit the temperature increase even further to 1.5 degrees Celsius above pre-industrial level.

The international organizations that announced their commitment to climate neutrality are:

1. Organization for Economic Cooperation and Development (OECD) Secretariat
2. Common Markets for Eastern and Southern Africa Secretariat (COMESA)
3. Eastern Africa Development Bank (EADB)
4. Western Africa Development Bank (BOAD)
5. Asian Development Bank (ADB)
6. Pacific Community
7. ICLEI-Local Governments for Sustainability
8. European Investment Bank (EIB)
9. European Bank for Reconstruction and Development (EBRD)
10. Southern African Development Community (SADC)

Secretariat

11. Inter-American Development Bank (IDB)

12. International Paralympic Committee (IPC)

13. Latin American Energy Organization (OLADE)

14. World Travel & Tourism Council (*WTTC*)

Some of the actions that these organizations are implementing to reduce their greenhouse gas emissions include the installation of solar photovoltaic systems, policies for reduction of air travel, upgrading of insulation and lighting systems in buildings, reduction of the amount of paper used at conferences, installation of efficient cooling systems, promotion of car-pooling schemes among employees, establishment of sustainable procurement policies, and enhanced collection and recycling of waste, among many others.

What to do to Reduce the Pace of Climate Change:

The IPCC report lists number of adaptations for the regions who should expect a serious challenge to the soonest including coastal defenses sustainable aquaculture and ecosystem restoration.

Individual attempts to reduce the climate change are by stop eating meat, drive electric cars and use less water at home. We should have a shift in consumption of energy, public property, personal lifestyle and consumption habits we would need to transition to 100 percent renewable energy, stop using fossil fuels for transportation and stop cutting down trees and start planting them by thousands. We should stop factory farming and reduce the world's meat intake.

All these steps are very necessary but not enough; we have to forge our governments now. If we don't speak up they won't act against their corporate overloads and continue producing the tones of green house gases. We have to educate our friends and family who might not know what's at stake. These individual steps can bring a literal change in what can happen in the future.

For Further Research,

Refer to:

1. United Nations reports

2. IPCC reports

3. TRUSTED News Agencies (AlJazeera, Reuters etc.)

4. United Nations channels on social media, YouTube etc.

Recent Reports for your reference-

https://www.ohchr.org/Documents/Issues/Poverty/A_HRC_41_39.pdf

https://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf

Topic B/ Planet's Lungs on Fire

1. INTRODUCTION

The most common hazard in forests is forests fire. Forests fires are as old as the forests themselves. They pose a threat not only to the forest wealth but also to the entire regime to fauna and flora seriously disturbing the bio-diversity and the ecology and environment of a region. During summer, when there is no rain for months, the forests become littered with dry senescent leaves and twinges, which could burst into flames ignited by the slightest spark.

The Himalayan forests, particularly, Garhwal Himalayas have been burning regularly during the last few summers, with colossal loss of vegetation cover of that region.

Causes of Forest Fires

Forest fires are caused by Natural causes as well as Man made causes:

- **Natural causes** – Many forest fires start from natural causes such as lightning which set trees on fire. However, rain extinguishes such fires without causing much damage. High atmospheric temperatures and

dryness (low humidity) offer favorable circumstance for a fire to start.

- **Man made causes** – Fire is caused when a source of fire like naked flame, cigarette or bidi, electric spark or any source of ignition comes into contact with inflammable material.

The youngest mountain ranges of Himalayas are the most vulnerable stretches of the world susceptible to forest fires. The forests of Western are more frequently vulnerable to forest fires as compared to those in Eastern Himalayas. This is because forests of Eastern Himalayas grow in high rain density. With large scale expansion of chirr (Pine) forests in many areas of the Himalayas the frequency and intensity of forest fires has increased.

2. PROBLEMS

1. A Heavy Loss to the Economy Is Incurred

A wildfire devastates everything that it engulfs. Thus, large areas of productive agricultural or forest land might be lost in the fire. Farmers lose their crops and livestock within a matter of a few hours to a few days and suffer a great economic setback. Those dependent on forestry for their income also experience heavy losses. If the destroyed areas were part of a popular tourist destination, then the tourist industry active in the affected area also faces a downfall. Although these economic sectors are directly affected by the fire, other businesses and communities also experience the adverse effect of wildfires. Private properties are also lost in such fires. Direct costs associated with firefighting are also high and is usually borne by the government. Post-fire restoration activities also consume a large sum of money.

2. Local Heritage Could Be Lost

If the fire engulfs an area that protects ancient historic environment features or archeological remains, it can translate to the loss of such local heritage. The damage can occur not only

during the fire but also as an after-effect of the fire. The lack of vegetation might expose such features to the erosive action of wind and water, accelerating the destruction of the features.

3. Carbon Sequestration and Storage Is Affected

Forests act as the carbon sink by absorbing the atmospheric carbon-dioxide and thus reducing the concentrations of this toxic gas in the atmosphere. The occurrence of wildfires thus destroys the beneficial plant cover which in turn adversely affects the carbon sequestration and storage.

4. Loss of Biodiversity

Wildfires lead to the failure of the entire ecosystem. Large areas are cleared off vegetation. Many animals, birds, reptiles, and insects burn to death. Others die due to starvation or stress. Thus, a heavy loss of biodiversity is one of the worst consequences of a wildfire.

5. High Levels of Soil Erosion

The soil is left exposed as vegetation disappears due to wildfires. Such soil is highly susceptible to erosion by the action of wind or water. Often, areas experiencing wildfires take a long time to recover or they are rendered permanently barren.

6. High Levels of Air and Water Pollution

Smoke and ash released during fires can pollute the atmosphere with toxic gasses and particles. As an after-effect of a wildfire, the loss of plants can also lead to the erosion of the soil and the contamination of water bodies by the eroded soil and dead plant and animal matter.

7. Wildfires Can Lead To the Extinction of a Species

Species with a highly restricted range are the most highly susceptible to extinction. A single disaster event can wipe out the entire population of such species. Thus, catastrophic wildfire events have the potential to render a species extinct in the wild.

8. Wildfires Have Adverse Effects on Health

The smoke and ash generated from wildfires pollute the atmosphere and cause health issues in people breathing in the polluted gas. Breathing problems, respiratory infections, headaches, dizziness, eye irritation, etc., are some of the common health issues experienced by people living in areas near the fire.

9. Human Lives Are Lost During Wildfires

Often wildfires can kill people if they do not evacuate in time to avoid the fire since wildfires take very little time to spread. However, despite warnings to evacuate, some people hold on to their homes in the hope that the fire will not reach them. Many of these people lose their lives in the fire.

10. Increased Vulnerability to Other Natural Disasters

Since vegetation cover is vital to protect the soil against erosion by strong winds and floods, the loss of such cover renders the area prone to natural disasters. In the absence of plants, the fire-affected region becomes easily prone to catastrophic floods or storms.

Wildfires Around the Globe:

BRAZIL

A season of intense, human-caused wildfires in the Amazon rainforest has scorched thousands of square miles of forest, blackened the skies over São Paulo, and sparked international concern about the fate of the most bio diverse landscape on the planet. The Amazon rainforest, besides being home to millions of species of wildlife, acts as a huge carbon sink, absorbing and storing carbon dioxide (CO2) and helping to cool global temperatures.
However, blazes that have been consuming the forest in recent months are releasing much of the CO2 stored in its biomass into the atmosphere. It would contribute to an increase the concentration of CO2 and aerosols in the atmosphere, which could drastically affect cloud formation and precipitation patterns. As a result, rainfall could drop by half in Brazil's two largest cities — São Paulo and Rio de Janeiro — home to a total of 33 million people. But far beyond these cities, smoke from these fires can spread throughout the entire continent and alter Earth's energy balance, because smoke particles retain solar radiation and prevent it from returning to the atmosphere. Changes in the surface radiation balance could affect the process of plant photosynthesis and alter the way in which forests participate in the water and carbon cycle.

Seven Amazon countries signed a pact Friday to protect the world's largest tropical rainforest in response to the record-breaking number of wildfires that have blazed through the Amazon rainforest this summer. Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru and Suriname agreed to create a network to coordinate their responses to disasters like this summer's fires. They also promised to increase the satellite monitoring of deforestation, share information on threats to the forest like illegal mining, develop reforestation and education initiatives and increase the participation of Indigenous communities.

RUSSIA

Russia is now on track to have a **record year** for wildfires as hundreds of blazes torch huge swaths of Siberia for the third month in a row after an unusually hot and dry summer left forests primed to burn.

The fires, likely ignited by lightning and strengthened by strong winds, have already burned more than **21,000 square miles**, an area larger than the state of Maryland.

Though Siberia is sparsely populated — its home to just a quarter of Russia's population — these blazes are alarmingly close to cities and are impacting people's health. Residents of Novosibirsk, Russia's third-largest city, located in southern Siberia, have suffered from the poor air quality, which have led to hacking coughs, stinging eyes, and hospital visits. The city of Ulan-Ude was also clouded by smoke. Dirty air stemming from blazes is often the **deadliest health effect of wildfires**, and the **impacts can linger for years**.

Though wildfires are a regular event in Siberian forests, the scale of the current infernos is unusual. For some environmentalists, the biggest concern is that the soot from the fires can deposit on Arctic ice and speed up its melt rate. That in turn can cause major disruption to local ecosystems. And if that ice is on land, it can run into the ocean and contribute to sea level rise.

INDONESIA

The fires devastating Indonesia have been called a 'crime against humanity'.As satellite data of the fire hotspots shows, forest fires have affected the length and breadth of Indonesia. Among the worst hit areas are southern Kalimantan (Borneo) and western Sumatra. The fires have been raging since July, with efforts to extinguish them hampered by seasonal dry conditions exacerbated by the El Nino effect. As well as Indonesia, the acrid haze from the fires is engulfing neighboring Malaysia and Singapore and has reached as far as southern Thailand.

The most obvious damage is to the forest where the fires are occurring. Indonesia's tropical forests represent some of the most diverse habitats on the planet. The current fire outbreak adds to decades of existing deforestation by palm oil, timber and other agribusiness operators, further imperiling endangered species such as the orangutan.

The human cost is stark; 19 people have died and an estimated 500,000 cases of respiratory tract infections have been reported since the start of the fires. It's estimated that the fires could cause more than 100,000 premature deaths in the region.Financial damage to the region's economy is still being counted, but the Indonesian government's own estimates suggest it could be as high as $47bn, a huge blow to the country's economy. A World Bank study on forest fires last year in Riau province estimated that they caused $935m of losses relating to lost agricultural productivity and trade. Forest fires have become a seasonal phenomenon in Indonesia. At the root of the problem is the practice of forest clearance known as slash and burn, where land is set on fire as a cheaper way to clear it for new planting. Peat soil, which characterises much of the affected areas, is highly flammable, causing localised fires to spread and making them difficult to stop.

It's a blame game, with everyone pointing the finger at someone else. Environmental group WWF Indonesia, which has been highlighting the problem of Indonesia's recurrent fires for years, says that the fires are caused by the "collective negligence" of companies,

smallholders and government (which isn't investing sufficiently in preventative measures). Many blame big business. According to a recent analysis of World Resources Institute data in September, more than one third (37%) of the fires in Sumatra are occurring on pulpwood concessions. A good proportion of the rest are on or near land used by palm oil producers. "Many of these fires are a direct result of the industrial manipulation of the landscape for plantation development," says Lindsey Allen, executive director of the conservation organisation Rainforest Action Network. In September, the Indonesian police arrested seven executives in connection with the fires, including a senior executive from Bumi Mekar Hijau (BMH), which supplied Jakarta-based paper giant Asia Pulp and Paper (APP). Others look away from the big corporations for blame. According to Henry Purnomo, professor at Indonesia's Bogor Agricultural University and a scientist at research group CIFOR, there are two culprits: poor small-scale farmers looking to expand their farmland, and rogue operators intent on illegally clearing forests for land acquisition.Global corporations operating in the area also blame smallholders and under-the-radar companies. The Roundtable on Sustainable Palm Oil, which counts many big palm oil businesses as members, has consistently said that the instances of fire on certified palm plantations in the affected region (which number 137) measure in single digits. Brendan May, chairman of sustainability advisory firm Robertsbridge (which has APP as a client), argues that it's "not in companies' best interest" to set fire to their own assets – an argument some campaign groups dispute.

Ending the practice of slash and burn is vital. Companies – big and small - must be held to account, before the law and the market, if found culpable.

Smallholders need assistance and incentives to pursue alternative, less harmful practices of forest management. Forest-dwelling communities often lack the skills and training, according to a recent CIFOR report. Meanwhile processors and buyers often fail to pay smallholders a fair price, something the signatories to the Sustainable Palm Oil Manifesto (which claims to go beyond RSPO certification standards) have pledged to correct.

Many big firms, such as palm producer Wilmar and timber giant APP, have signed zero-deforestation pledges in recent years. But the real test comes in pushing their commitments beyond the boundary fences of their plantations and down into their supply chains, where smaller firms operate with less public scrutiny.

Many are calling on the Indonesian government to step up. WWF-Indonesia's deputy director, Irwan Gunawan, says the government action lacks clout and "has not yet resulted in deterrent effect to prevent any recurrence".

Removing the culture of political patronage that protects private companies in Indonesia is essential, says Purnomo. A budgetary rethink is also required. At present, the ratio of public spending on fire suppression versus prevention is around 80:20, Purnomo says.

Another major contribution to reducing future fires would be an up-to-date online, searchable land registry. Land tenure in Indonesia is often unknown or disputed, making it difficult to establish where responsibility lies. Coupling such a database with digital mapping technologies such as WRI's Global Forest Watch could make identifying the culprits a whole lot easier. One Map, a government-backed project to develop such a spatial mapping solution, is currently under development.

USA

The **Great Chicago Fire** was a conflagration that burned in the American city of Chicago on October 8-10, 1871. The fire killed approximately 300 people, destroyed roughly 3.3 square miles (9 km^2) of the city, and left more than 100,000 residents homeless. The fire began in a neighborhood southwest of the city center. A long period of hot, dry, windy conditions, and the wooden construction prevalent in the city led to a conflagration. The fire leapt the south branch of the Chicago River and destroyed much of central Chicago, and then leapt the main branch of the river consuming the near north side.

Help flowed to the city from near and far after the fire. The city government improved building codes to stop the rapid spread of future fires, and re-built rapidly to those higher standards. A donation from the United Kingdom spurred the establishment of the Chicago Public Library, a free public library system, a contrast to the private, fee for membership libraries common before the fire.

The fire is claimed to have started at about 9:00 p.m. on October 8, in or around a small barn belonging to the O'Leary family that bordered the alley behind 137 DeKoven Street. The shed next to the barn was the first building to be consumed by the fire. City officials never determined the exact cause of the blaze, but the rapid spread of the fire due to a long drought in the prior summer, strong winds from the southwest, and the rapid destruction of the water pumping system explain the extensive damage of the mainly wooden city structures. There has been much speculation over the years on a single start to the fire. The most popular tale blames Mrs. O'Leary's cow, who allegedly knocked over a lantern; others state that a group of men were gambling inside the barn and knocked over a lantern. Still other speculation suggests that the blaze was related to other fires in the Midwest that day.

The fire's spread was aided by the city's use of wood as the predominant building material in a style called balloon frame. More

than two-thirds of the structures in Chicago at the time of the fire were made entirely of wood, with most of the houses and buildings being topped with highly flammable tar or shingle roofs. All of the city's sidewalks and many roads were also made of wood. Compounding this problem, Chicago received only 1 inch (25 mm) of rain from July 4 to October 9, causing severe drought conditions before the fire, while strong southwest winds helped to carry flying embers toward the heart of the city.

In 1871, the Chicago Fire Department had 185 firefighters with just 17 horse-drawn steam engines to protect the entire city. The initial response by the fire department was quick, but due to an error by the watchman, Matthias Schaffer, the firefighters were sent to the wrong place, allowing the fire to grow unchecked. An alarm sent from the area near the fire also failed to register at the courthouse where the fire watchmen were, while the firefighters were tired from having fought numerous small fires and one large fire in the week before. These factors combined to turn a small barn fire into a conflagration.

When firefighters finally arrived at DeKoven Street, the fire had grown and spread to neighboring buildings and was progressing toward the central business district. Firefighters had hoped that the South Branch of the Chicago River and an area that had previously thoroughly burned would act as a natural firebreak. All along the river, however, were lumber yards, warehouses, and coal yards, and barges and numerous bridges across the river. As the fire grew, the southwest wind intensified and became superheated, causing structures to catch fire from the heat and from burning debris blown by the wind. Around midnight, flaming debris blew across the river and landed on roofs and the South Side Gas Works.

With the fire across the river and moving rapidly toward the heart of the city, panic set in. About this time, Mayor Roswell B. Mason sent messages to nearby towns asking for help. When the courthouse caught fire, he ordered the building to be evacuated and the prisoners jailed in the basement to be released. At 2:30 a.m. on the 9th, the cupola of the courthouse collapsed, sending the great bell crashing down. Some witnesses reported hearing the sound from a mile (1.6 km) away.

As more buildings succumbed to the flames, a major contributing factor to the fire's spread was a meteorological phenomenon known as a fire whirl. As overheated air rises, it comes into contact with cooler air and begins to spin creating a tornado-like effect. These fire whirls are likely what drove flaming debris so high and so far. Such debris was blown across the main branch of the Chicago River to a railroad car carrying kerosene. The fire had jumped the river a second time and was now raging across the city's north side. Also likely a factor in the fire's rapid spread was the amount of flammable waste that had accumulated in the river from years of improper disposal methods used by local industries.

Despite the fire spreading and growing rapidly, the city's firefighters continued to battle the blaze. A short time after the fire jumped the river, a burning piece of timber lodged on the roof of the city's waterworks. Within minutes, the interior of the building was engulfed in flames and the building was destroyed. With it, the city's water mains went dry and the city was helpless. The fire burned unchecked from building to building, block to block.

Finally, late into the evening of the 9th, it started to rain, but the fire had already started to burn itself out. The fire had spread to the sparsely populated areas of the north side, having consumed the densely populated areas thoroughly.

Once the fire had ended, the smoldering remains were still too hot for a survey of the damage to be completed for many days. Eventually, the city determined that the fire destroyed an area about 4 miles (6 km) long and averaging ¾ mile (1 km) wide, encompassing an area of more than 2,000 acres (809 ha). Destroyed were more than 73 miles (117 km) of roads, 120 miles (190 km) of sidewalk, 2,000 lampposts, 17,500 buildings, and $222 million in property, which was about a third of the city's valuation in 1871.

Of the approximately 324,000 inhabitants of Chicago in 1871, 90,000 Chicago residents (1 in 3 residents) were left homeless. 120 bodies were recovered, but the death toll may have been as high as 300. The county coroner speculated that an accurate count was impossible, as some victims may have drowned or had been incinerated, leaving no remains.

In the days and weeks following the fire, monetary donations flowed into Chicago from around the country and abroad, along with donations of food, clothing, and other goods. These donations came from individuals, corporations, and cities.

Steps Needed to Reduce Wildfires:

Current resources need to be redirected to support research that improves the understanding of fire causes and affects and identifies existing management practices that predispose ecosystems to harmful fires. Forest departments need to invest more in the promotion of management systems that mimic natural fire regimes or take advantage of well-established fire use or natural fire; develop tactics to prevent recurring harmful fires; establish reliable fire monitoring programs and strengthen the involvement of key stakeholders, especially local communities, in fire management.

The World Conservation Union (IUCN), The Nature Conservancy (TNC) and The Worldwide Fund for Nature (WWF) have come together to work proactively with multi-lateral agencies, governments, private sector and local communities to develop integrated fire management approaches that address underlying causes and develop long-term sustainable solutions. The core elements of such an approach must include:

- Supporting research to improve the understanding of forest fires and their ecology, ecological and social costs and benefits, causes and management options.
- Building awareness amongst policy-makers, the public and the media of the underlying causes of catastrophic forest fires.
- Mandating and equipping managers to implement integrated fire management programs.
- Involving local communities and land managers in management planning and implementation, assisting them to participate effectively.
- Developing and enforcing compatible and mutually reinforcing land-use laws that provide a legal basis for the ecologically appropriate use of fire.
- Discouraging land management practices that predispose forests to harmful fires.
- Promoting management strategies to mimic natural fire regimes, including techniques such as prescribed burns and managed wildfires.
- Avoiding manipulating natural or well-established fire regimes.
- Establishing reliable fire monitoring systems that provide early warning of high fire risk and fire occurrence, and include evaluation of ecological and human impacts of fire.

- Preventing further forest loss and degradation from recurrent catastrophic fires, and reduce fire risk in forested landscapes, through ecologically appropriate restoration.

For Further Research:

Refer to:

1. Reports from TRUSTED news agencies

2. Statistics from .Gov websites

3. Personal Interviews of Leaders