UN SDGs: 17 Goals to Transform Our World
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SDG 15 Life on Land Part 2

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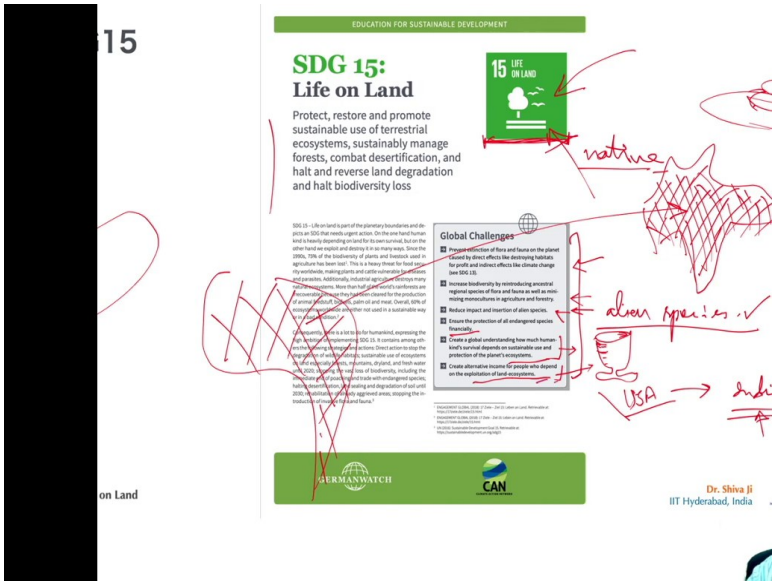

SDG 15, Life on Land that is what we are studying. So some global challenges, if we see this prevent extinction of flora and fauna on the planet caused by direct effects destroying habitats and for profit and indirect effects climate change. Increased biodiversity by reintroducing ancestral regional species of flora and fauna as well as minimizing monocultures in agriculture and forestry, reduce impact and insertion of alien species.

Well, what is alien species, in this context you may be wondering, it is not that some alien arriving in some flying saucer, that is not what you are discussing over here, the real alien species means any a place for example if you are talking about any local place, your native place, so there are native species of plants, animals, birds, reptiles, and insects, etc etc.

Like along with the native humans also, Indian subcontinent if you see we are all native to this place and for thousands and lakhs of years our ancestors our forefathers and they have lived over here. And similarly the all of those other life forms also of flora and fauna. So you may call them as native to this place, that they are naturally have made in this place as their habitat and this is place there, where they have been living for several generations, for all of these hundreds and thousands of years. So that becomes our native of this thing.

Any species which is non-native that it is coming from some other place or for example in Indian subcontinent if some species comes from for example South American continent, so

that will become as a non-native or alien species. Because conditions here geographic, climatic, weather, and all of those things are very unique and different compared to what is what we have in Indian subcontinent.

So it may fit in, or it may not fitting, or it may pose challenges, or it may get threatened by local species, anything can happen, it depends. But whatever may happen is not actually going to be favorable for either this place or this place, or for that species, or for the other local species. So that is why, this practice is a kind of attracts attention to prohibit any such illegal, transfers often animal species, or plant species, birds, etc etc to stop this alien species is an invasion.

Sometimes there are invasive species also you may be aware some weeds actually came in the wheat which was imported from United States of America long back several decades earlier, when I know India used to import its food. And it got scattered in the whole of the India and now we are facing this very strong invasive species which kills local plants, and which is not good for human health also, it creates a lot of skin irritation, eye disease, and several such things.

So that is this is what we are discussing over here as an alien species. Further ensure the protection of all endangered species financially. Create a global understanding how much humankinds survival depends on sustainable use and protection of plants ecosystems. So everybody must be aware of the criticality of our dependence on all of these living forms. Create alternative income for people who depend on the exploitation of land ecosystems.

Well traditionally there are culture, societies in a tribe tribal who are dependent on forests and they have been using it for a long time. So in a way it is their right even to use it now, but in the renewed context definitely we can motivate them or create some alternate methods and ways to earn their livelihood in order to save these local species, so that is what we are talking here.

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So what does it mean for the global North, if you see, well it is a very humble honeybee here in this picture is you may have, may have read some research papers, some articles, and this news that this honeybee is so critical for the survival of our own agriculture, and the plantation, and flowering, and crops, and all of these systems. Basically our food system that if this species actually goes extinct our agriculture will come to a halt.

That much is the criticality of one species of these bees, these insect, they are so important for our survival. So many places actually there is extinction or it is recorded that their numbers is falling down drastically. Directly it poses existential threat to the Human Society. So let me read this for you.

In most of the countries in the global North only few places are still untouched wilderness as most ecosystems are used for food production and the extraction of resources. Paradoxically, the highest biodiversity is found in urban Gardens and most encounters with big predators happen in Zoos. Especially, urban residents experience a growing disconnection from wilderness leading to bizarre effects even though urban citizens are concerned about messages on the extinction of important insect species on wildfires and storms, they that destroy forest and on vast degradation of fertile soil.

They usually struggle to realize the connection of their lifestyle and a growing rate of environmental degradation. Moreover, people are scared hearing about the wolves come back in rural areas or about growing numbers of raccoons, foxes, and boars living in their urban neighborhood. The new urban animal trigger old situations and challenge the perception of

nature in the global North. Despite the age of growing urbanization and biodiversity crisis, nature is still conceptualized as a romantic place that people long for.

This conception can be helpful as in Germany people feel strongly about nature conservation and expect their government to act. 69 percent of German citizens strongly agree that nature is important for a good life. They also feel closely tied with the nature of their region. While 51 do not feel threatened by the destruction of the nature in Germany. 65 percent fear that there will not be any intact nature left for their children or grandchildren.

Against this backdrop the German government technologies in its German National Strategy for Sustainable Development that intact ecosystems are crucial for a system development and human existence on earth. Politicians have introduced agendas to protect biodiversity and to enlarge nature conservation areas and create measures for the sustainable cultivation of German forest and rank soil.

However, the limits of the government, governmental consistency become evident in the practical implementation, as for example once the aim to reduce soil ceiling appeared in to fail, it was shortly prolonged for 10 years from 2020 to 2030. So you see this underlines the importance and some after effects, since there is no loss of forest cover. Some of the wild animals are moving towards urban areas and stuff.

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So there is so much kind of imbalance kind of thing which is happening. Another example, for the global South, what does it SDG 15 means for a global South. So let us see this. This is the picture from Masai Mara, this Masai is a tribe. They have been the traditional hunter

gatherers from on this land for several hundreds and thousands of years. Their forefathers have inhabited and they have lived in sick with this wildlife and nature for a long time, all of this time.

Many countries of the global South are known for their rich biodiversity in plants and wildlife. Some countries are home for big mammals gorillas, elephants, rhinos, or several species of big cats, in some cases they are national symbols. Lush and biodiverse tropical rainforest cover the area of many equatorial countries in the global South. Economically seen this high level of biodiversity is a precious resource from the ecological perspective it is crucial for the planet and its ecosystems to survive.

However, the intensified extraction of national resources to satisfy the constantly increasing global demand often leads to the destruction, pollution, and contamination of precious nature habitat, not to mention the labor conditions and dependency relations that are thereby often uphold. The export of these natural resources, however, is also crucial to enhance economic development, fight poverty and hunger and tackle economical, educational and health issues.

This sustainability dilemma of natural resource extraction is complemented by the agricultural sector. Farming methods are intensified and land is expanded in order to enhance economic development leading to massive stress for many ecosystems.

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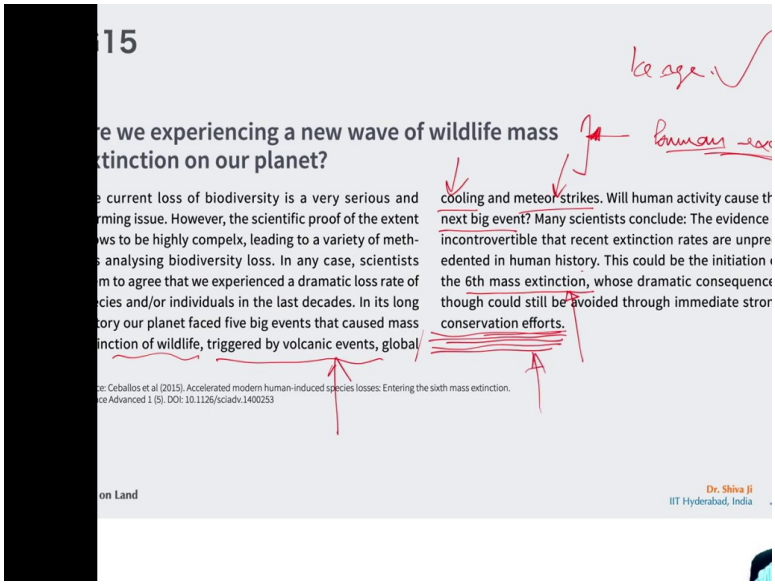

So that is the condition in the global South. So the question is, are we experiencing a new wave of wildlife mass extinction on our planet, because there has been episodes you may be aware there are ice ages, it comes cyclic fashion comes and goes and all of that it drives mass

extinction, then again on its revival several excuse SPC actually revive or new ones actually come back. But there have never been an instance where one species of humans has driven other species to their extinction as such a rate.

So that is definitely unprecedented and first time happening in the planets existence. So here the current loss of biodiversity is a serious and alarming issue. However, the scientific proof of the extent shows to be highly complex, leading to a variety of methods analyzing biodiversity loss. In any case, scientists seem to agree that we experienced a dramatic loss rate of species and or individuals in the last decades. In its long history our planet faced five big events that caused mass extinction of wildlife, triggered by volcanic events, global cooling, and meteor strikes.

So these used to have been the major events for driving extinction. Really, human activity cause the next big event is the kind of a concentration going on because already human society, if not all but some of them society some of the countries and communities, they have done biggest harm. Many scientists conclude the evidence is incontrovertible that recent extinction rates are unprecedented in human history.

This could be the initiation of sixth mass extinction, whose dramatic consequences though could still be avoided through immediate strong conservation efforts. So you can see another round of extinction it looks it has begun, in human, under human influence but there is still time that it can be reversed.

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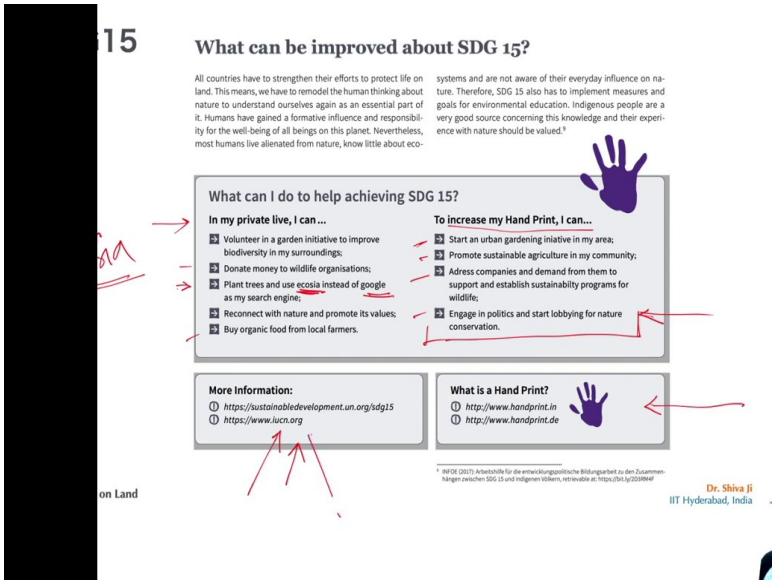

So what can be done about it, what can be improved on this, I can as a private person volunteer in a garden initiative to improve biodiversity in my surroundings, donate money to wildlife organizations for betterment plant trees and use Ecosia instead of Google as my search engine. This is also one of the things you can do another search engine, alternate search engine of compared to Google, Ecosia.

Maybe you make a search and if you can use it. Reconnect with nature and promote its values, buy organic food from local farmers. Well to increase my handprint I can start an urban gardening initiative in my area, so that my green handprints will increase, promote sustainable agriculture in my community, address companies and demand from them to support and then establish sustainability programs for wildlife.

Engage in politics and start lobbying for nature conservation, so this also you can do, wherever you are, in whatever capacity you must advocate for this. For more details you can refer sustainable development.un or iucn International Union for Conservation of Nature. And along with that, you can refer these websites also handprint.in handprint.te for more information about volunteering and being part of these organization like iucn works for the conservation of nature.

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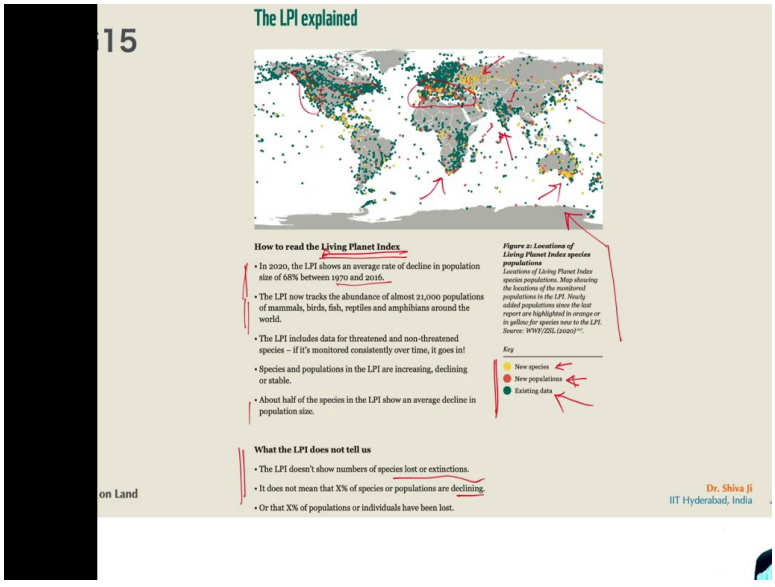

LPI index, what is LPI, Living Planet Index. So you see the listens new species by yellow, new populations by red, and existing data by green. So how to read this LPI index? In 2020 LPI shows an average rate of decline in population size of 68 percent between 1970 to 2016. LPI now tracks the abundance of almost 21000 populations of mammals, birds, fish, reptiles, and amphibians.

The LPI includes data for threatened and non-threatened species, if it is monitored constantly over time it goes in. Species in population LPI are increasing declining or stable. About half of the species in LPI show an average decline in population size. Well what it does not tell? The LPI does not show numbers of species lost or extinction, it does not mean that X percent of species or populations are declining or the x percent of populations or individuals have been lost.

So you can see these locations on this map. So green ones existing data, new populations by red, some new populations you can see here in the Indian subcontinent also. Mostly in India there are lots of greens, few reds, and a few yellows. A lot of yellows in the western Russia, and lot of reds and yellows in the southern Europe, and in the west coast U.S, and partly here on Massachusetts side, and South Africa, more yellows and reds the south of Australia, in Japan, Koreas also.

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A beautiful frog. So LPI is one indicator among many showing severe declines or changing in the recent decades. So you can see this abundance the LPI measures the population abundance of thousands of vertebrates species around the world. Other indices measure different things or have broader taxonomic breadth giving us different information about, how biodiversity is responding to human pressure. And here the IUCN Red List Index, extinction risk you can see here.

Humans have driven at least 680 species of vertebrates the best studied taxonomy group to extinction since year 1500. This equates to 1 percent of species in this group, many other species are now at elevated risk of extinction owing to human impacts. The IUCN Red List represents the most comprehensive and objective system for assessing the relative risk of extinction of species or one lakh species have now been evaluated, using information on life history rates.

Next on composition, community composition the mean species abundance index and biodiversity intactness index species distribution, habitat index, species distribution or dynamic by nature with local populations constantly adapting to environment. The magnitude of these dynamics has, however been greatly altered by human pressure.

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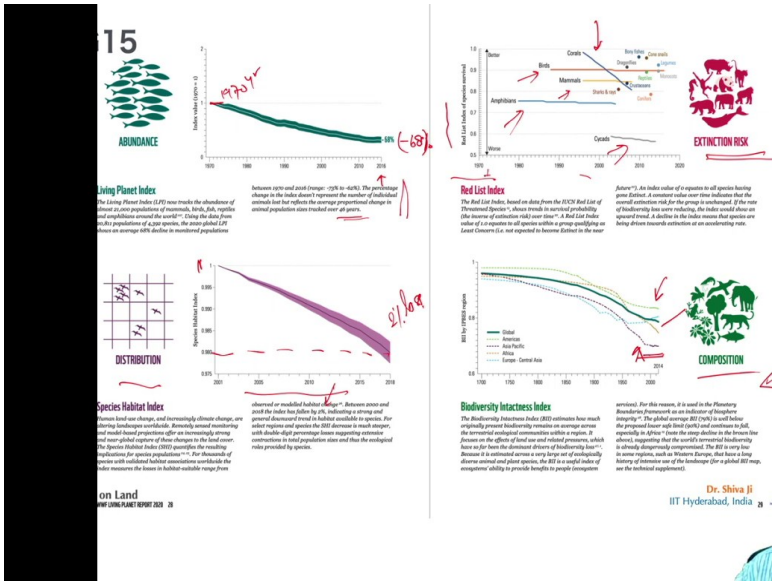

So you can see these graphs over here which talks about index value of 1 in year 1970 to 2016, there is a loss of 68 percent, minus 68 percent we are seeing this figure, between this these years the percentage change in the index does not represent the number of individuals animal lost but reflects the average proportional change in the animal population size is tracked over 46 years.

In distribution, species habitat index may if you see from 1 this has come down to 0.98. Observed our model habitat change between year 2000 and 2018. So under a range of around 17-18 years, it has fallen by 2 percent, 2 percent loss. Indicating a strong and general downward trend inhabitat available to species, for select regions and species sh-1 decrease is much deeper.

Red list index if you see, extinction risk. So red list index of species survival on this side and decades on this side 1970 to year 2020, so a span of around 50 years, you can see how fast certain species have declined. So corals extremely fast, you see this has an almost come down at a rate of, at an angle of around 45 degrees. Then we have, I think all of these are coming down slowly cycads, amphibians, mammals, birds they are all gradually coming down.

Biodiversity intactness index in this one, composition you can see, this is, this dark green is the global figure which is drastically coming down. The biggest loss has happened in the Asia Pacific and in that I think the minimal loss has happened in Americas, global average is this one.

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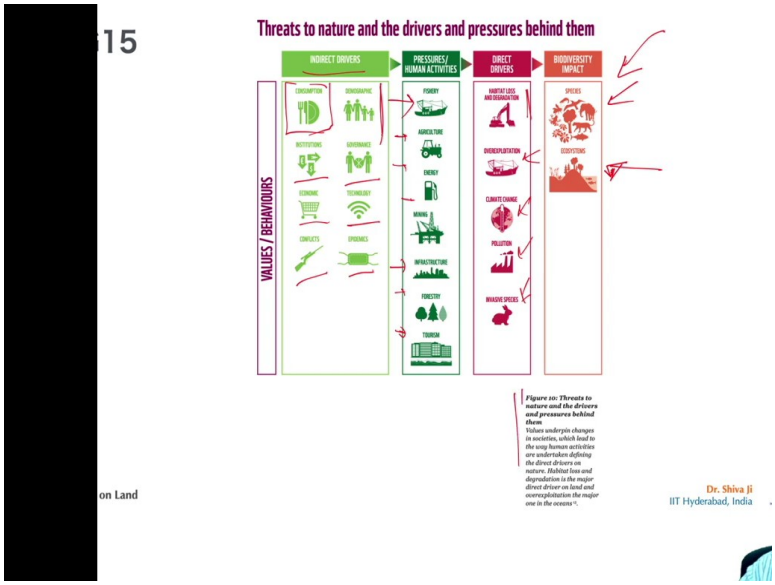

So threats to nature and the drivers and pressures behind them. So as we see these numbers are declining. So what are the direct threats, so some indirect drivers if you see a large consumption of resources, demographics, institutions, governance, economic, technology, conflicts, epidemics they are causing a pressures and lot of other human activities fisheries, agriculture, energy, mining, infrastructure, forestry, tourism, etc. which in turn is driving many things direct drivers are listed over here. Loss of natural habitat, over exploitation, climate change, pollution, invasive species, then lastly we have biodiversity impact, so several species and ecosystem they are all at the verge of damages, severe damages. So this is like a threat we are seeing.

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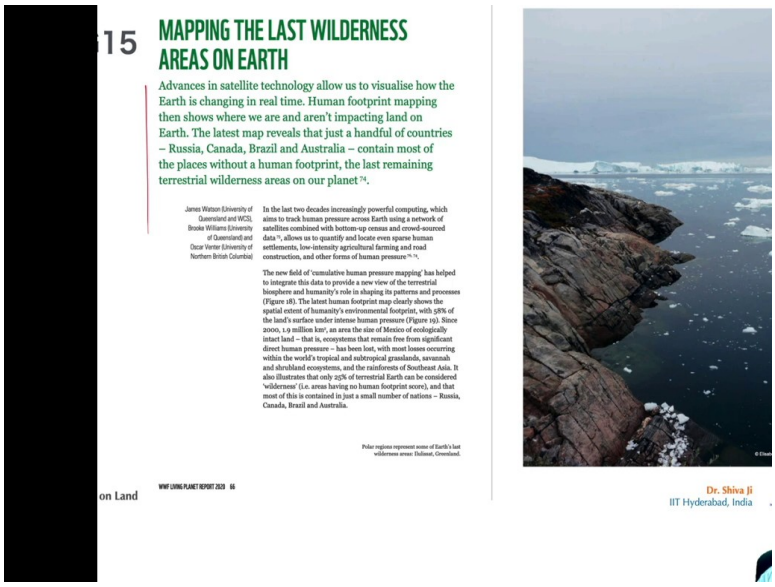

Mapping the last wilderness areas on earth, how do you map. So again technology comes to the rescue and mainly from satellites. So satellite technology allows us to visualize how the earth is changing in real time. Human footprint mapping, then shows where we are, and are not impacting land on earth the latest map reveals that just a handful of countries Russia, Canada, Brazil, Australia, etc. But more also can be seen now maybe you can check again for new set of such data.

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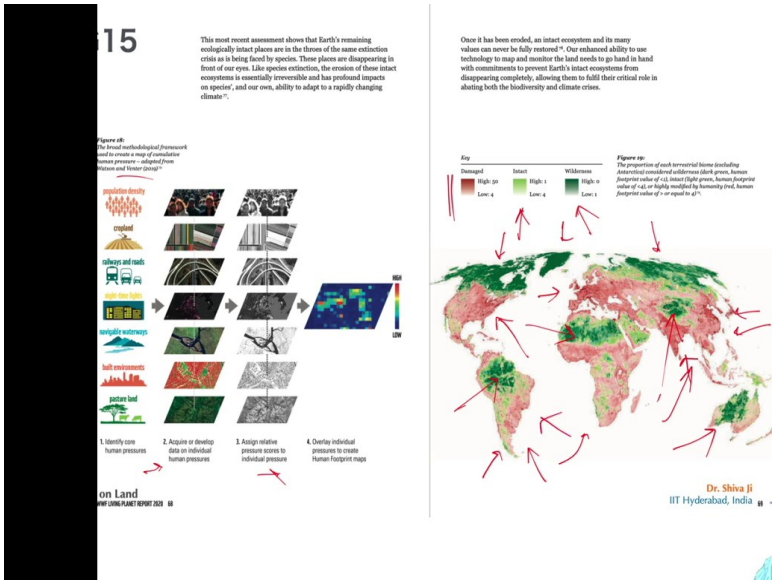

So this is an assessment which shows, this correlation the broad methodological framework used to create a map of cumulative human pressure adopted from Watson and Vendor. So you can see all of these are the actually human pressures and that is leading to huge pressure from humanity and there are results.

So if you see this graphic damaged is represented by reds and intact light green wilderness dark green. So you can see portion of Canada, in north of Russia, Siberian region, and Tibet here, and Sub-Saharan Africa, and parts of Amazon in Brazil, and in other countries even in Chile here slightly green I see, and Central middle Australia. So these are having greens, rest of the countries, rest of the regions of the world if you see that has fallen into the red trap.

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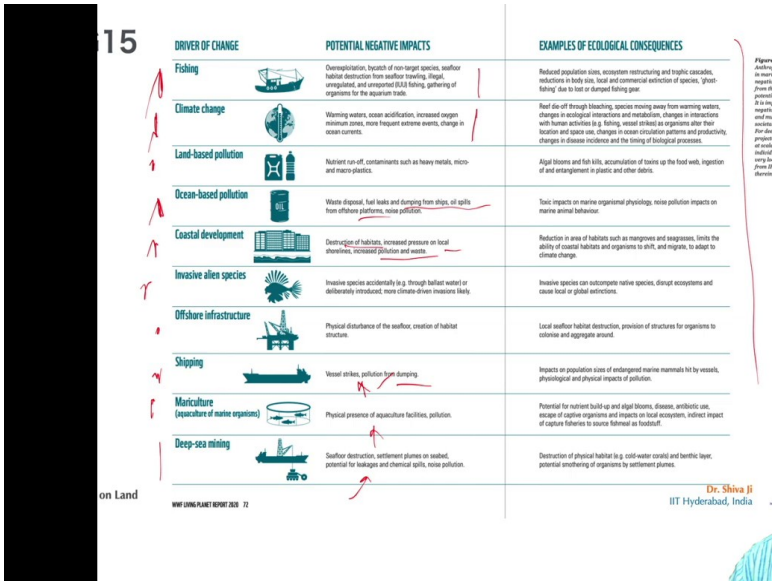

So drivers of change we saw some more regular potential negative impacts of fishing for example, over exploitation, bycatch of non-target species, seafloor habitat destruction from seafood trawling, illegal unregulated and reported fishing, gathering of organizations for aquarium trade, etc.

Overall for climate change, warming waters, ocean acidification, desertification, etc. increased oxygen, minimum zones, more frequent extreme events change in oceanic currents. Land based population, nutrient runoff, contaminants such as heavy metals, micro and micro plastics. Ocean based pollution, waste disposal, fuel leaks, damaging from ships oil spills, noise.

Coastal development, destruction of habitat, increased pressure on local shoreline, increased pollution and waste. Invasive alien species, invasive species accidentally introduced more climate event invasions likely, offshore infrastructure, physical disturbance of the seaboard, creation of habitat structure. Shipping, vessel strikes, damages to the coral, reefs, etc. pollution and oil spills etc. plus sometimes they carry alien species from one part to the other that also becomes a problem. Mariculture, physical presence of aquaculture facilities. Deep sea mining, examples of consequences you can see here on the right side.

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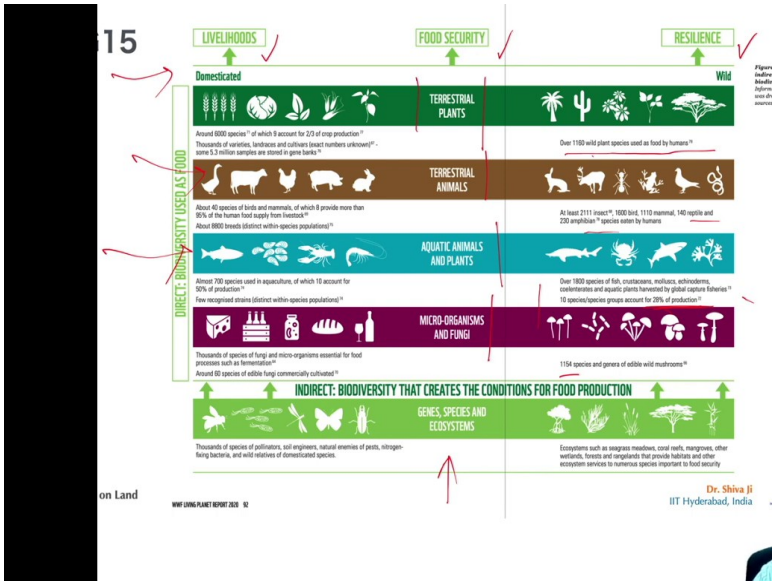

And our livelihoods on the first column, food security, and resilience. So these things are domesticated whether these are crops, or domestic animals, pet animals, etc. They are not domesticated and they like living next to the human society. Well this is essential for food security here, for alteration plants, traditional animals, aquatic animals and plants, microorganisms and fungi, etc.

And resilience over 100, 1160 wild plant species use food by humans at least 2111 insects 600 Birds 110 mammals 140 reptile and 230 amphibians species eaten by humans. Over 1800 species of fish, crustaceans, mollusks, echinoderms, coelenterates, and aquatic plants harvested by global capture fisheries, 10 species group account for 28 percent often such kind of production. 1154 species and genera of edible wild mushrooms.

Indirect biodiversity that creates the conditions for food production. So if biodiversity is maintained, all of the rest of the things will be maintained. One nice soothing image for you, you can see there is this crane flying at the top.

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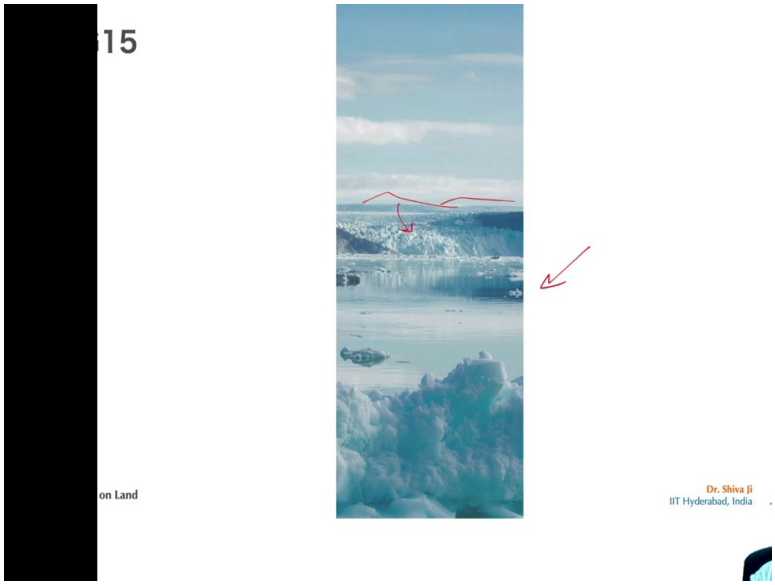

Another picture from Arctic or Antarctic region polar regions, or maybe glacier lake from places you can see the glacier, we are the high mountains from there this glacier is moving down and we have these water, freshly melted water.

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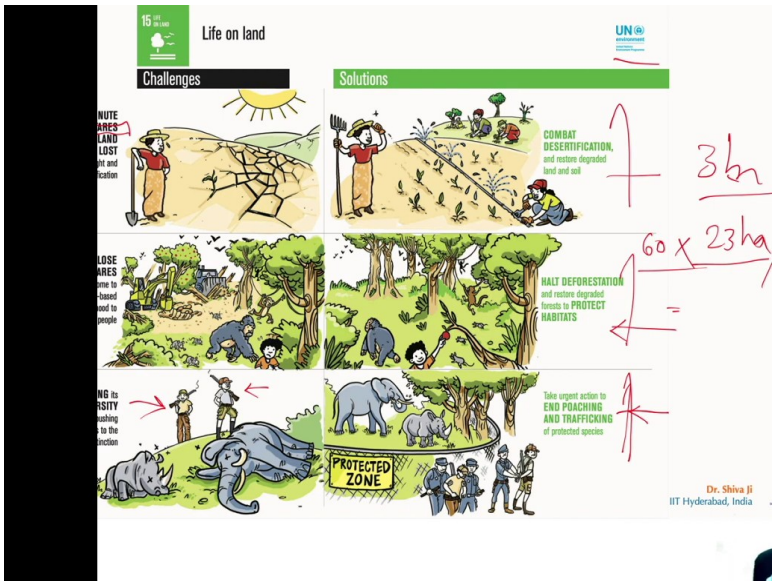

So what are the challenges in this case if you see recommended suggested by UN environment. Every minute we saw 23 billion hectares of land is getting lost and that is translated to every minute 23 hectares of land. So that 3 billion land, hectare land, what we

saw initially, that is getting lost at the rate of 23 hectares per minute, that is the rate at which this loss is happening. During a span of 1 hour of this class 23 multiplied by 60 hectares of land, we have lost during this one session, that is the rate at which this degradation is taking place.

Solution, combat desertification, restore degraded land and soil. Every year we lose 13 million hectares of forest that are home to more than 80 percent of all land-based species and provide livelihood to 1.6 billion people. Halt deforestation, restores degraded forest to protect habitats. The world is losing his precious biodiversity at an alarming rate pushing 22 percent of animals to the brink of extinction, for some selfish weird reasons.

Take urgent action to end poaching and trafficking of protected species and even all these species. So now we have understood the importance of life on land and how it is crucial for our own survival and existence. So I am sure you have now got the lessons from this, look in your vicinity and perhaps you can plan maybe a small assignment or an exercise based on this and maybe you can contribute from your end. So with this we have come to the end of this session, thank you all for joining, see you in the next one.