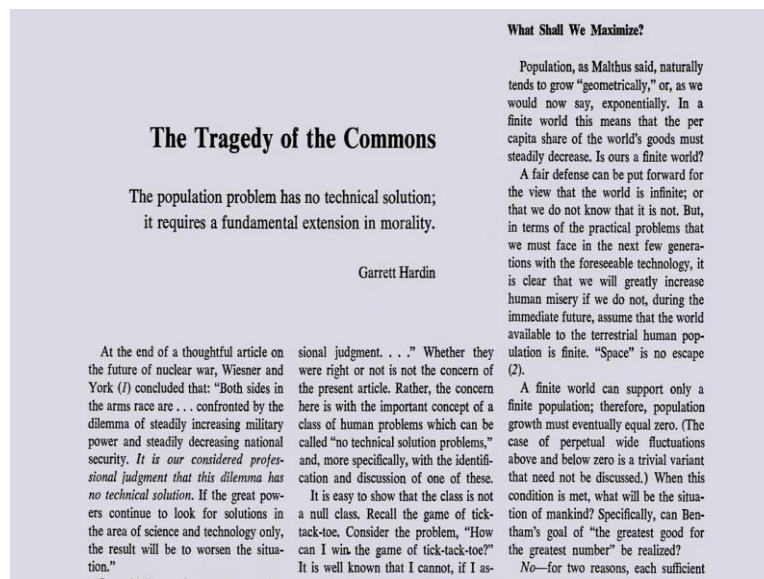


Natural Resources Management (NRM)
Professor Sudip Mitra, PhD
Centre for Disaster Management and Research (CDMR)
Head, School of Agro and Rural Technology (SART)
Discipline - Agriculture Engineering
Indian Institute of Technology, Guwahati, Assam, India
Week - 05
Lecture - 30
The Tragedy of the Commons

So, following our common property rights, which we call a CPR, which we discussed at previous lecture, today, I am going to discuss with you a paper, which has been written by none other than Garrett Hardin.

(Refer Slide Time: 0:48)



And this gentleman actually has talked about a topic, which many people at that point of time was actually afraid to discuss. Now, here, the title of this paper is tragedy of common. Now, in the previous lecture, we discussed about common property right where we have discuss many common property, which actually give lot of value and uses to the community. But when we actually utilize it fully or when that particular natural resource get exhausted of his further deliver your benefit for society, then nobody owns it, because everybody thinks that this is not mine. And a lack of ownership prevails.

As an example, a river, see for our Ganga River. Now, as long as Ganga River is flowing, water is clean, we are utilizing for various other purposes in our life, but at the moment because of our activity, anthropogenic activity, river Ganga become suppose contaminated,

unclean, then nobody comes to say, I will clean it. So, today I am going to discuss this paper, which at some point of time, some of the words, you might feel that it is a bit harsh, but that is the harsh reality. I will today, share this particular paper with you in the mode of a tutorial among this mooc lecture.

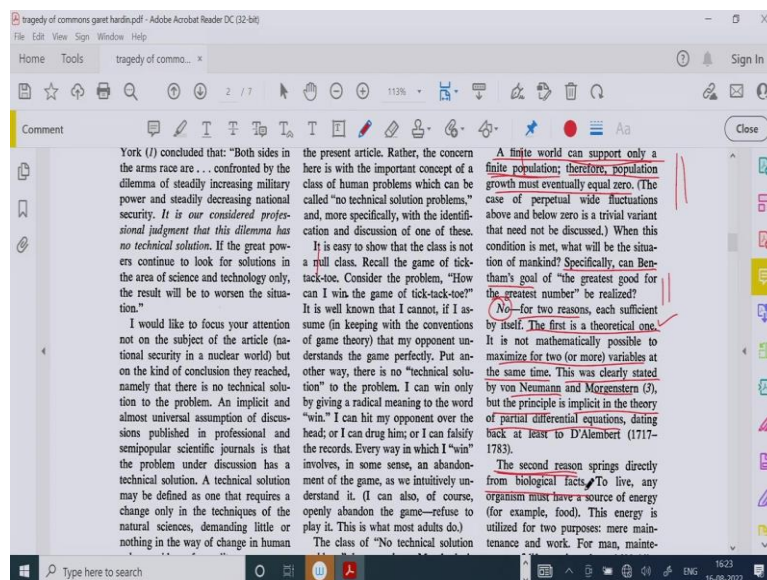
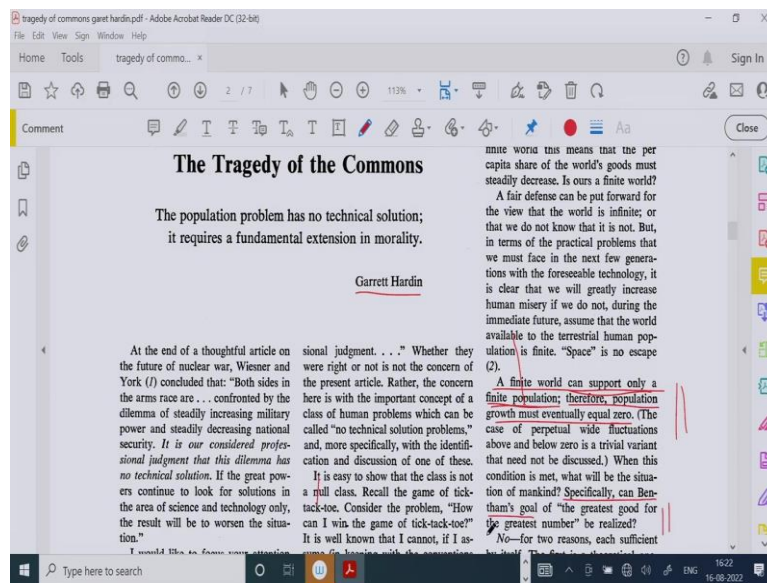
So, you will see that when you read this paper, I would encourage all of you, it is available, it is open access, in Google, and you can search this paper and can download and can read. Every time you read this paper, you will find a better clarity about the subject, why this author is calling tragedy.

Now, what actually authors actually tries to say here, if you read this paper, he starts talking about population, as you see here, he says that population problem has no technical solution; it requires a fundamental extension in morality. Now, also in paper, he actually argues and he asked the reader means us, what actually we should maximize? Should we maximize population? Or should we maximize the utilization of the resources that nature has given to us.

Now, if you see that Malthus, he said natural population growth, it is geometric in nature, or exponentially. In finite world, this means that per capita share of the world's goods must steadily decrease. But the question is that, is our world a finite world? Do you think that our world is finite? You will see that a fair defense, some people, some thinkers, they put forward for the view that world is infinite. In terms of the practical problems that we must face in the next few generation with the advent of different technology, it is almost clear that we will greatly increase human misery.

If we do not, at least during the immediate future, start assuming that world available to the terrestrial human or human species population is finite, you cannot continue, extracting the World Resources. So, this paper actually written late 60s. So, you can imagine that how author, so, many years back, when the world population was not as much as today, even though he could visualize that in which direction the mankind was moving.

(Refer Slide Time: 5:23)



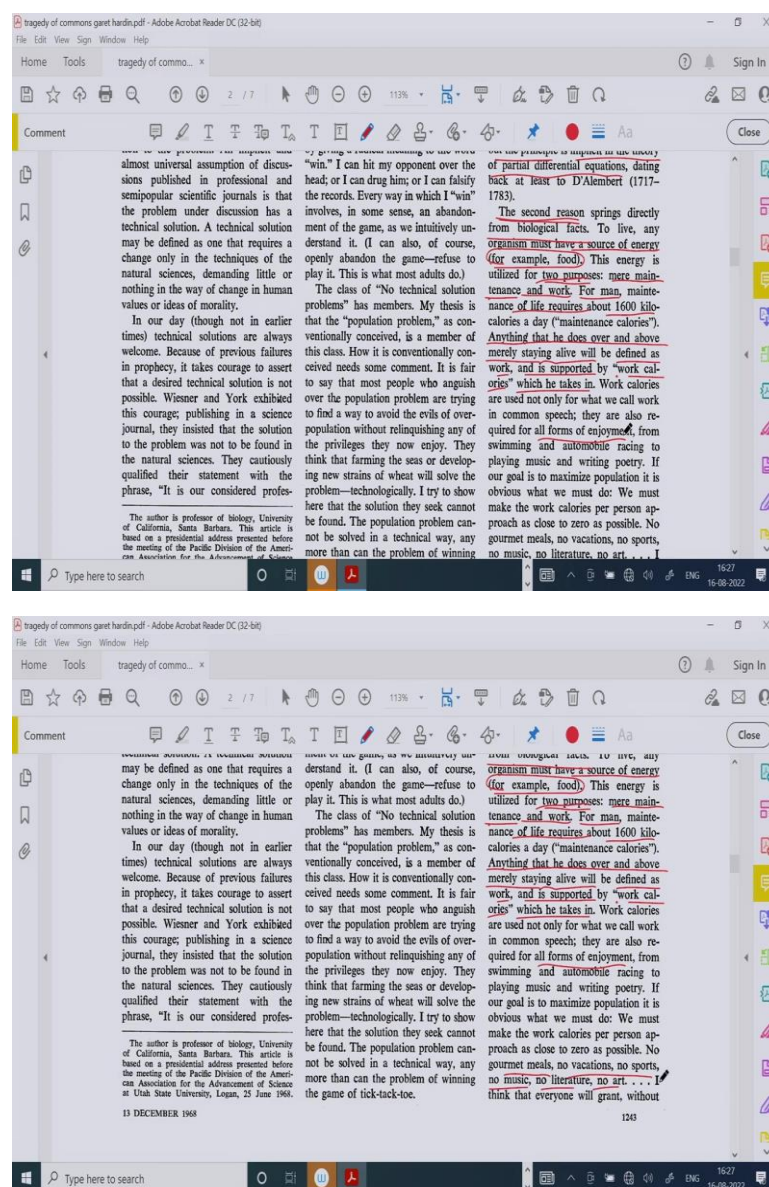
People, started thinking about that to the world is infinite. But here, Garrett is actually arguing, and also some other thinkers, they said that, if we continue utilizing the resources which is available in this earth in this world, thinking that the world is infinite, we are going to get into problem. So, a finite world can support only finite population. This is a very important statement that, we should always remember that a finite world can support only finite population, therefore, population growth must eventually equal to zero.

Now, is that possible? We need to actually think about this particular statement that is made here. So, the argument is that, if the world is finite, or world can support only a finite population. If you consider that world is finite, then it can support only finite population, it cannot be that a finite world can continue support infinite population. So, if you for time

being you accept the fact that the world is finite, and it will support finite population, in that case, population growth must eventually equal to zero; when this condition is met, what will be the situation of mankind?

Bentham said the statement that the greatest good for the greatest number, but can that be realized in this kind of situation? Garrett thinks it is not possible for two reasons, what are those, each sufficient by itself, the first is a theoretical one; it is not mathematically possible to maximize for two or more variables at the same time. This was clearly stated by Von Neumann and Morgenstern, but the principle is implicit in the theory of partial differential equation. The second reason, springs directly from biological fact.

(Refer Slide Time: 8:00)



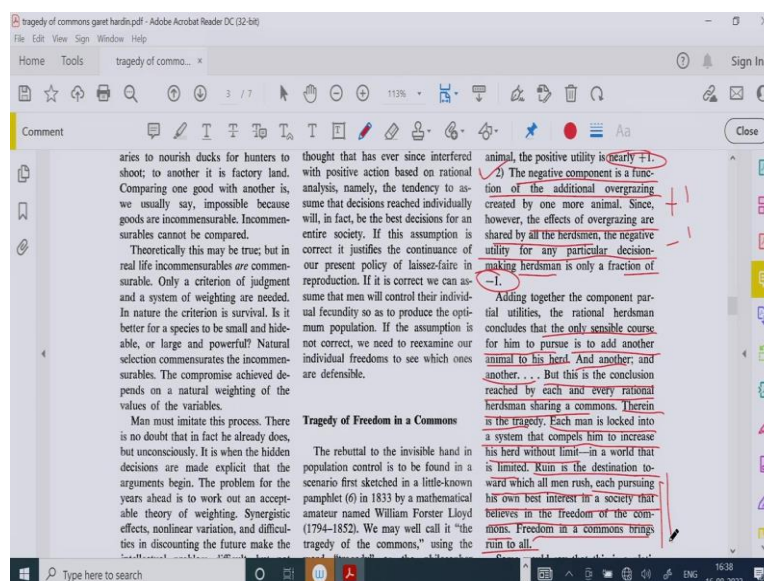
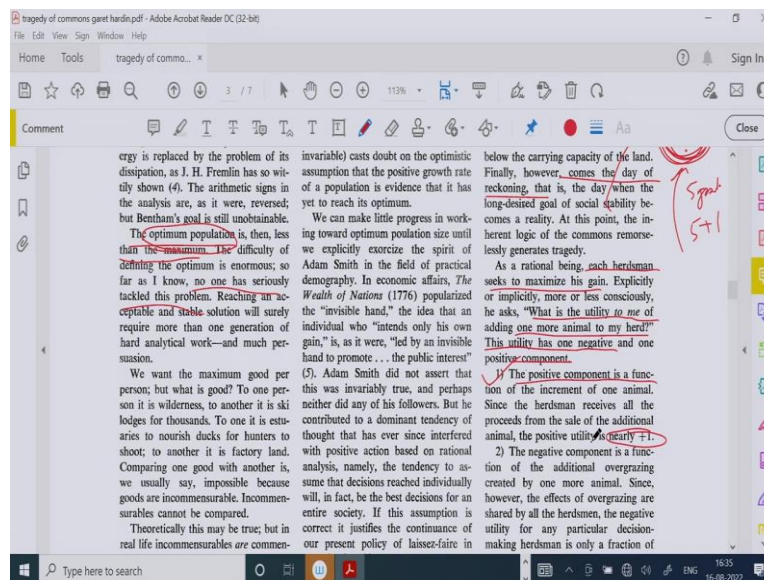
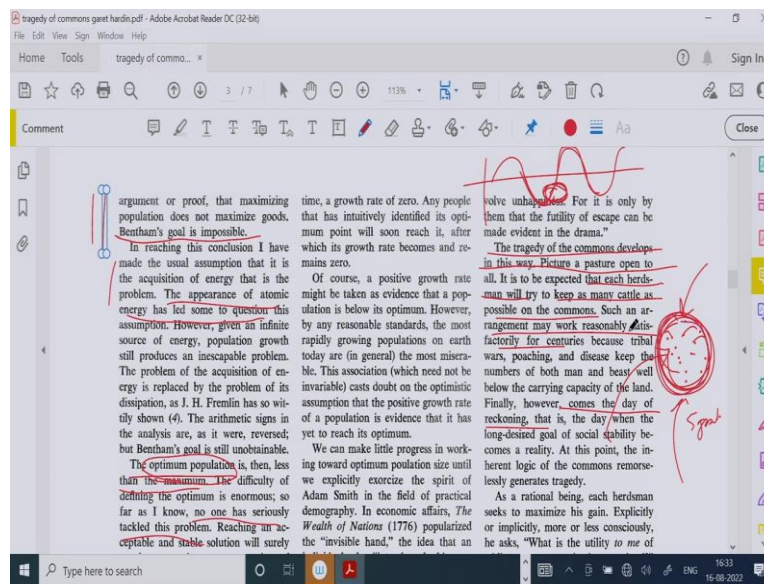
If we wish to leave any organism per se, to live, to survive, must have a source of energy, which comes from food. Now, this energy is utilized for two purposes, one is mere maintenance and the other is work. So, you maintain your system and you work for these two reasons, two purposes, how energies required. For us for man, maintenance of life requires about 1600 kilocalories a day. Remember, these are the things which have been mentioned in 1960s, late 1960s. So, there will be certain differences in many requirements and things today, why I am sharing this little so called controversial paper, because this will give you also the other perspective of common property right.

Here Garrett Hardin actually clearly says that if you do not control your growth of population, there is a chance that you will get perished. Now, to establish his argument, he has mentioned given many examples, and that is why it is important that we should look at this paper very critically. Anything that a person does over and above merely staying alive will be defined as work. And that is supported by work calories, which he takes in through food.

Now, work calories are used not only for what we call work in common speech, they are also required for all forms of enjoyment in our life. Starting from suppose swimming, playing soccer, cycling, for anything that you actually entertain yourself some amusement that also requires certain amount of energy. If our goal is to maximize population, it is obvious that we must do it, we must make the work calories per person as close to zero as possible.

Now, no meals, no vacation, no sports, no music, no literature, no artistic activity; I think that everyone will grant without argument or prove that maximizing population does not maximize goods.

(Refer Slide Time: 10:45)



So, Bentham's goal is impossible. Now, in reaching these conclusions, guiding say that he has assumed that it is the acquisition of energy that is the problem, the appearance of atomic energy has led some to question this particular assumption. However, if you look at that, the arithmetic signs in the analysis as it were, it was reversed and Bentham goals are still unobtainable.

So, the optimum population is then what less than the maximum, the difficulty in defining the optimum is always very difficult. So far as Garrett Hardin is concerned in this paper, he says that no one has seriously talked about this particular problem of defining optimum population in the world. So, how much actually this earth can carry.

Now, if you recall that in one of the previous classes, we discussed about carrying capacity, where we talked about how long the earth or the globe can actually carry, so, you talked about S-curve, J-curve. As long as the supply is available, the population will grow. At certain point, when the supply gets diminished, population also will start going down. Now, when population goes down, then again the supply seems increasing. So, again population and grow up. So, this is the way actually population goes up and down with the availability of resources.

Now, if you look at the Tragedy of Commons develops particularly, say an example, which Garrett has given a pasture, a green pasture, a green grassland, which is open to all, now, it is to be expected that each a person who has cows or lambs or goats will try to keep as many cattle as possible on that common land. Now, this kind of arrangement may work reasonably satisfactorily for centuries because of various kinds of conflict and other thing population if it goes down, as I discussed here, then it will seem like that the supply of resources again high, so, again population will go up. But finally, comes the day, when the long desired goal of social stability becomes a reality.

And at this point, the inherent logic of the commons remorselessly generates tragedy. Why? Because, suppose, in a piece of land, where a person was actually having his own suppose, five goat till that time he is there with five goats, that particular green pasture look enough for him. And so, from five, he got seven, eight like that because this group of goats started reproducing, populations started increasing, up to certain points to this pasture was sufficient enough for him to continue with this practice. But other day another person comes in. As these places open place nobody can stop. So, that person also come with suppose five goats. Similar way now, these goats also start eating on feeding on these grasses and they also

reproduce. So, imagine there will be a competition, competition for foods. Now, both the person now will try to maximize the benefit out of that green pasture. So, what you can visualize tell me.

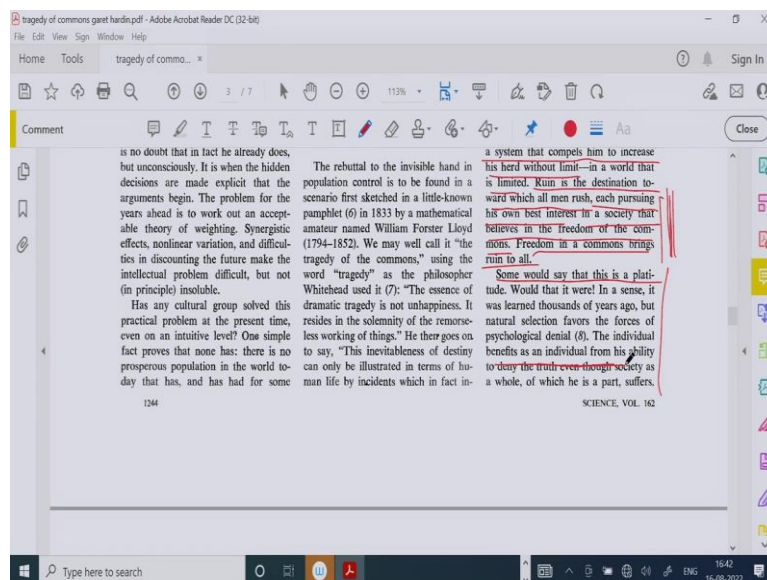
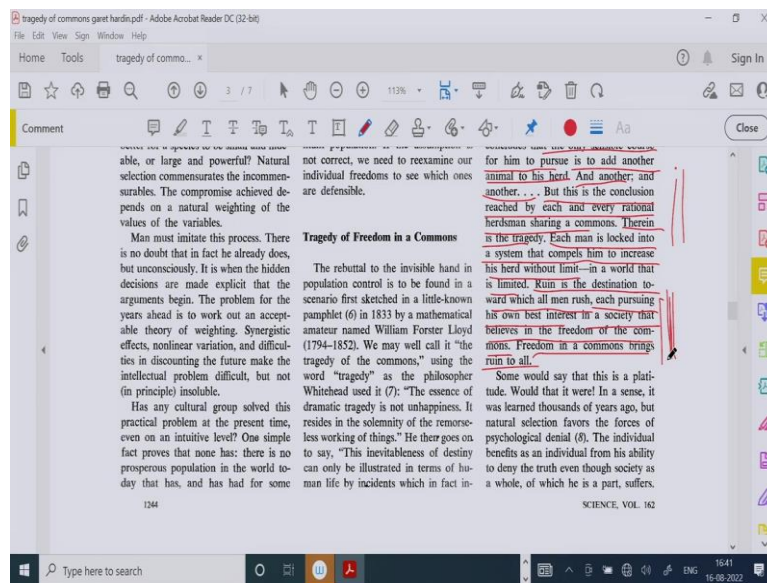
Now these two person of course, till one point, they will be able to maintain a peaceful stay there, but after some time, if both of their goats produce reproduce more or another person coming, then the supply of raw material like grasses will be less, and the number of goats will be more and there the conflict will start, who will share the benefit and who we will not. Now, each herdsman will try to maximize his gain, explicitly or implicitly. Now, each one of them will start asking themselves, what is the utility to me, of adding one more animal to my herd?

They started with five, they will start thinking, what is the utility if I add one more. Now, this utility has one negative and one positive component. And what is that the positive component is a function of the environment of one animal. Since that herd man receives all the proceeds from the sale of the additional animal, the positive utility is nearly plus one. But the negative component is a function of the additional over grazing, created by one extra animal into that grassland. Now, the effect of over grazing is shared by all herdsman. There are now one or two herdsman they both of them brought. So, both of them will actually share, the overgrazing effect. So, that means every individual goat will get little less grass than previous time.

So, the negative utility for any particular decision making herdsman is only a fraction of minus one. Now, if you add plus one and minus one, the rational herdsman concludes that the only sensible course for him to pursue is to add another animal to his herd and another means there comes the problem. He keeps on adding number of animal in that particular pasture. But this is the conclusion reached by each and every rational herdsman, while sharing a common property, common grassland, and there is that tragedy. Each man is locked into a system that compels him to increase his or her herd without any limit, in a world where resources are finite. And if people start expecting or extracting infinite amount or limitless amount of benefit, out of those resources, destruction is inevitable.

So, ruin is the destination toward which all men rush. That is what Garrett is saying, each one of them pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings reigns to all. This is a most important statement that I wish all of you to understand.

(Refer Slide Time: 18:39)



He says that, by doing this kind of practice you got is one piece of green pasture, which is common to all. So, I bring five goats, you bring five goat, and then after some time, I feel okay, my benefit has to grow. So, I add another in my group, so that means six goat, my friend also neighbor also had another one, he says, I also need benefit, extra benefit. So, that is the way we start, adding one after other animal to enhance our benefit and exploit that green pasture as much as possible. And we forget for time being that that green grass is limited, finite.

So, certainly that is what Garrett here argues that this is the way we actually move towards the destruction and why because this society has given full freedom to use anything which are common. So, any common property like our river Ganga, who will stop you to go there and

take a bath or use the Ganga water. Oxygen that we breathe in till now it is common property. Now, you just go there and you burn something in your garden. That smoke will certainly will take away some oxygen from the surrounding environment, but you feel that is your right because within your property you are doing. But when the same activity is done in somewhere which is no one's common free land. So, there comes the kind of feeling, that world is infinite.

So, you use as much as you can that is what is dangerous, because that will lead towards ruin, as he said in this paper. So, he says that the freedom in this society to utilize common property actually will bring everyone to destruction or ruin, that is what he has presented in this paper. So, I brought this paper today to discuss with you, so that you yourself can understand that way the garret is right or wrong or some of his views are right or wrong. So, this actually will open our thinking process with regard to the right to common properties, and how it should be utilized.

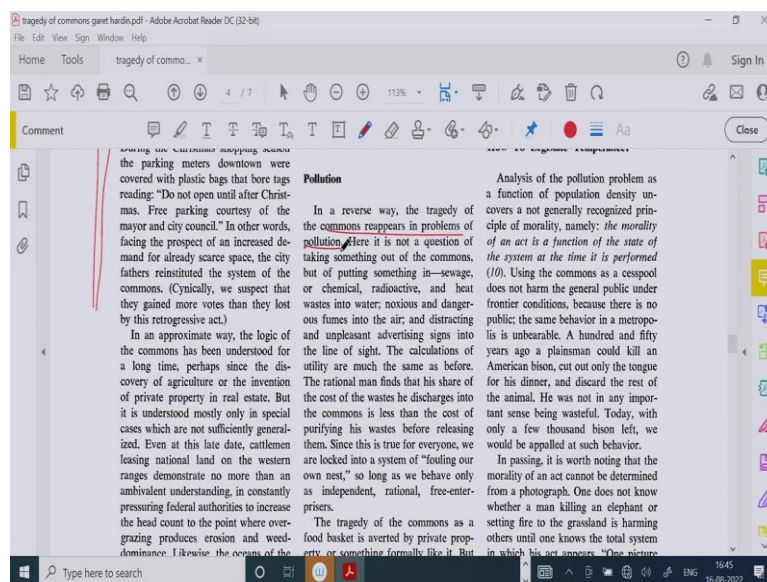
He also says that some probably would say that this is a platitude kind of thing, in the sense that it is learned that thousands of years ago, by natural selection favors the forces of psychological denial. Now, the individual benefits as an individual from his ability to deny that truth. Even though society as a whole of which he or she is a part of, that society will also suffer because of one person or two persons, individual benefit, some other person in the society will suffer.

(Refer Slide Time: 22:00)



Now, this kind of understanding, Garrett has put almost in late 60s. So, you can imagine that the kind of thinking that he had at that point of time. Now, he also says that education can counter attack this natural tendency of us to do wrong thing, but the inexplicable succession of generation requires that the basis for this knowledge be constantly refreshed. A very critical statement. We cannot stay stagnant as far as knowledge is concerned, exploration of new knowledge and new facts should always get refreshed, and new things should come into the system. Then he goes on and he says, a few more examples, now, another example that Garrett brings in is about pollutions. And you will see how nicely he can explain this particular aspect.

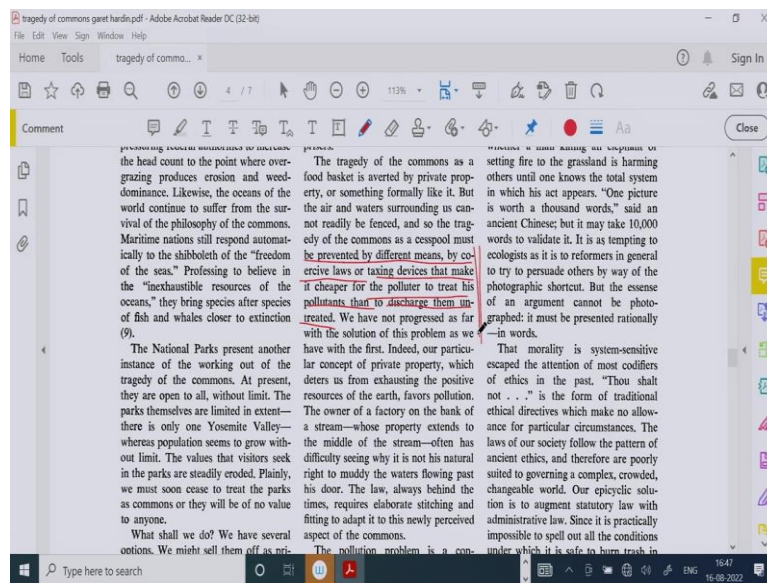
(Refer Slide Time: 23:03)



He says that the Tragedy of Commons reappears in problems of pollutions how say in sewage, in a city, any place, there is a process that our waste material from our household goes to a certain place and then gets treated. Now, similar way, suppose, you have a river, which is passing through your neighborhood and that river is common. Now, if you stay next to the river and decide to throw the waste which is generated at your household into the river, or unless until there is a strict rule or regulation, you will continue doing that because, again, that river is not your property, you feel it is everyone's, it is common. So, you behave in a different way.

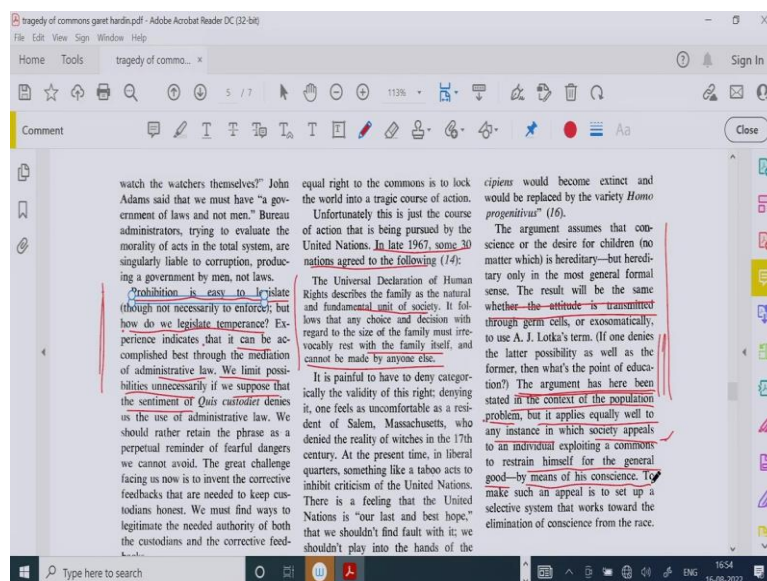
Similar way our air which is common, so that air can also be intoxicated by different activities. But when it impacts the air intoxicate the air, then it is going to impact thousands millions of people. So, one or two individual activity can impact almost the entire society.

(Refer Slide Time: 24:24)



Now, the Tragedy of Commons as a food basket is averted by private property or something formally like it. But the air and water surrounding us cannot readily be fenced and so the tragedy of the commons as a cesspool must be prevented by different means; by coercive laws, taxing devices that make it cheaper for the polluter to treat his pollutants, then to discharge them untreated into the water body, which is common. So, in a sense that more morality is a system sensitive, aspect and that is why Garrett also says that the consciousness, morality of individual has a very important role to play to make the common property, useful as well as maintaining appropriate manner otherwise, certainly, it is a tragedy and it is tragedy of common.

(Refer Slide Time: 25:27)



Now, the next thing again, Garrett, in this paper, he mentioned a very important point, and that prohibition is easy to legislate, but how do we legislate temperance? He says that experience indicates that it can be accomplished based through the mediations of administrative law. We can also limit the possibilities unnecessarily if we suppose that the sentiment of *Quis custodiet* denies us the use of administrative law. Now, this he said at his condition in late 1960s. What he means is that, whether government at any particular point of time can legislate something can bring in some law, rule and regulation and thus can actually stop the people to mistreat the common property.

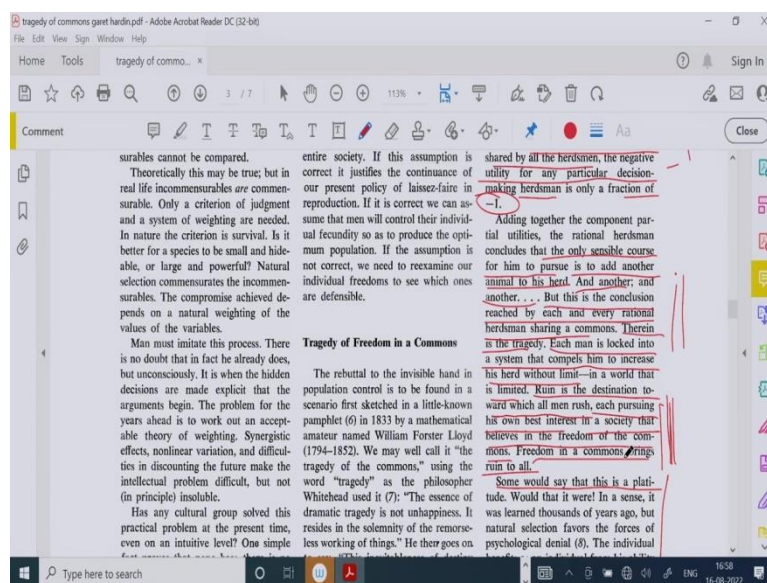
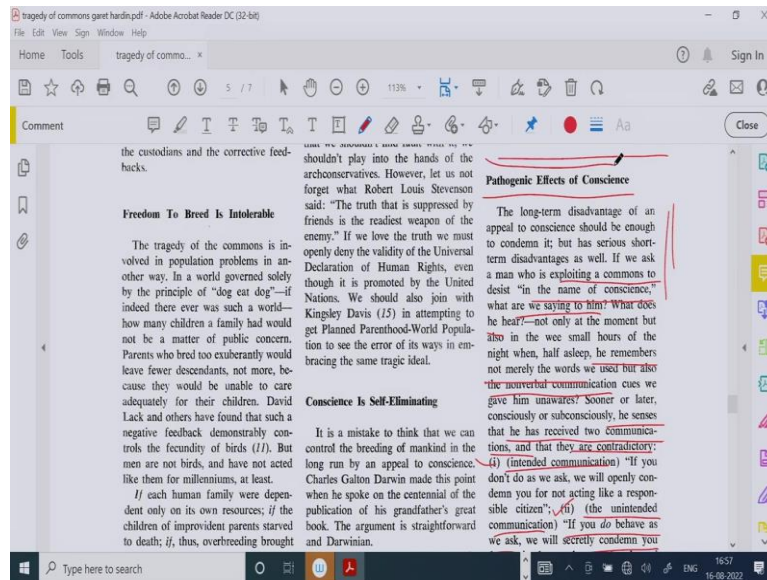
Now, if you see that, in around late 1967, some 30 countries 30 nations, they agreed to the Universal Declaration of Human Rights, which describes the family as the natural and fundamental unit of a society. It follows that any choice and decision with regard to the size of the family must irrevocably rest with the family itself, and it cannot be made by anyone else. Such a profound thinking. Now 30 nations in 1967 agreed to this following resolution. Now, it is painful, to have to deny categorically the validity of this right. Denying it one may feel as uncomfortable as a resident of any particular city. So, if you look at the long term impact of any rule or regulation brought in by legislation to somehow maintain the natural or the common properties for the longer uses; potential long uses of these common properties for larger benefit of larger society, it is important that while having the common property right, certain amount of regulation should also be in place.

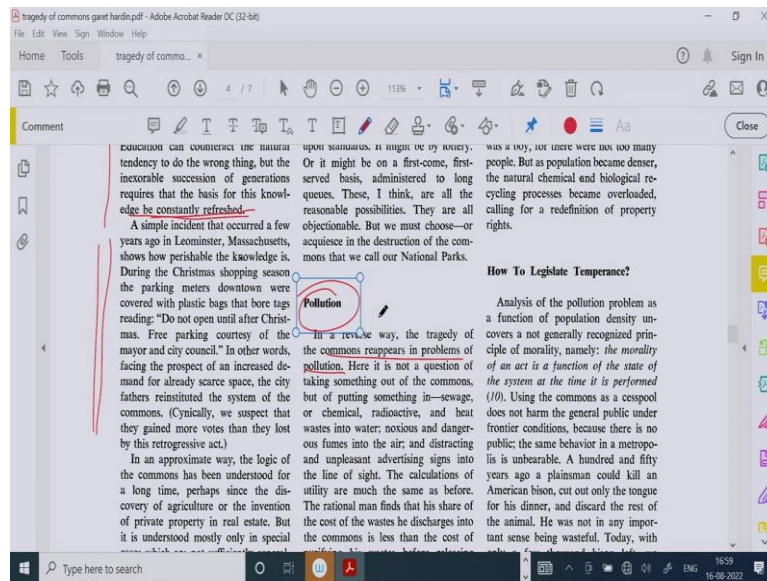
He also argued at one point that the conscience, our consciousness or the desire for children is hereditary. Every one every organism in this ecosystem wants to procreate. Procreation is the reality of life, but hereditary only in the most general form and sense. The result will be the same whether the attitude of a father is transmitted to the son or son's characteristic transmitted to his son. So, this result will be completely dependent on heredity, if one denies the later possibility, as well as the former then what is the point of education? This is the questions he asked.

So, at this juncture, the argument that Garrett brings in, in the context of population problem, but this also applies equally well to any instance in which society appeals to an individual exploiting commons or common property to restrain himself for the general good by means of his own conscience. So, ultimately, it boils down to self consciousness. So, the population problem, how to actually regulate that, this can be left to the conscious of an individual. So,

this is a kind of a very sensitive topic sensitive aspect that gets it also wanted to bring in into public domain.

(Refer Slide Time: 29:49)





Now, there are various other aspects that in this paper Garrett Hardin has discussed about; the pathogenic effects of conscience. What it says is that the long-term disadvantage of an appeal towards conscience should be enough to condemn it. If we ask a man who is supposedly exploiting a common property in the name of conscience, what are you saying to him? What does he hear? You will see that even if you say about his utilization of natural resource beyond his requirement or need, this gentle man will remember, not merely the words we used, but also the nonverbal communication, cues that we have give him unaware, sooner or later, consciously and subconsciously. That man will sense that he has received two type of communication and that are contradictory in nature.

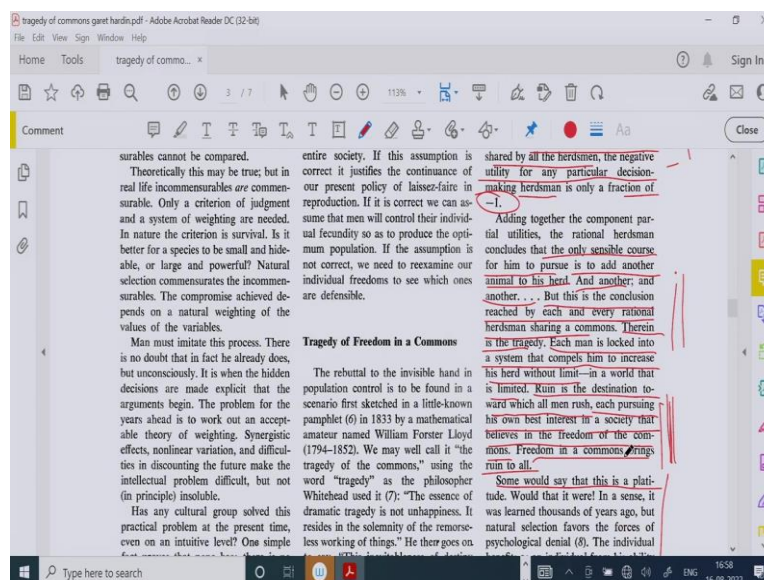
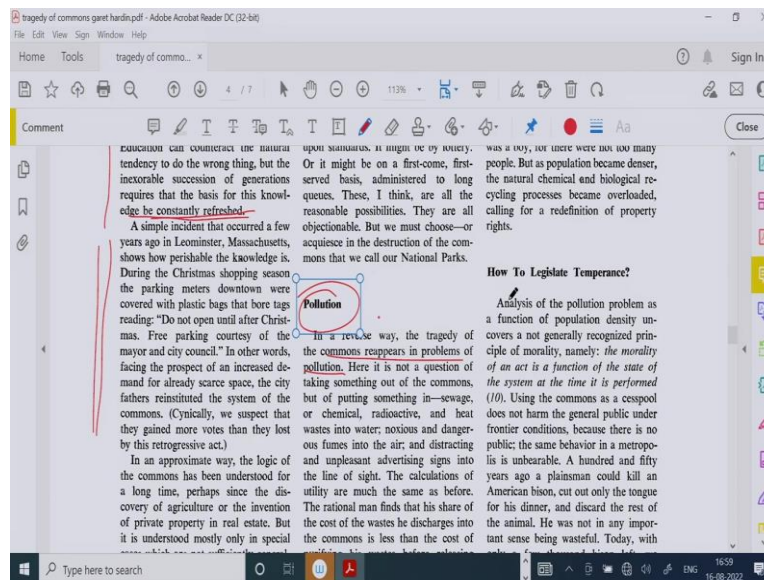
One is intended communication, if you do not do as we ask, we will openly condemn you for not acting like a responsible citizen that is one that is the intended communication. Two, the unintended communication which we did not want to actually communicate, but still it got communicated to the person. What is this? If you do behave as we ask, we will secretly condemn you for a simpleton, who can be shamed into standing aside while the rest of us exploit the commons. See, what does this mean? Suppose, one person who has listened to this, he may be standing, he may be not stopped utilizing or stop what you call misusing the resources, common resources, but others will keep on doing it. So, how to control this kind of situation?

So, here, Garrett calls it those pathogenic effects of conscience. So every man then is caught in what Bateson has called a double bind. Bateson and his co-workers have made a plausible case for leaving the double bind as an important causative factor in the genesis of schizophrenia. The double bind may not always endanger the mental health of anyone to

whom it is applied. A bad conscience is a kind of an illness. Nietzsche another researcher has said that a bad conscience is a kind of illness.

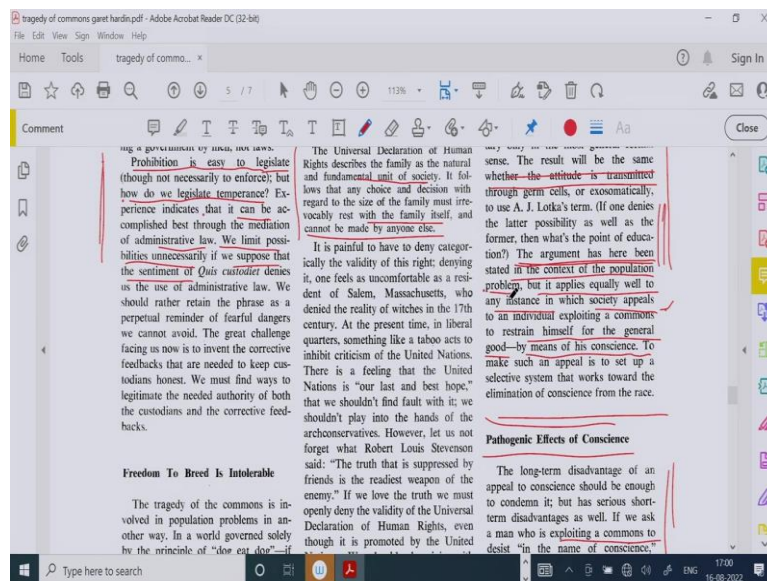
So up to this point, what we actually find in this very thought provoking paper is that

(Refer Slide Time: 32:50)



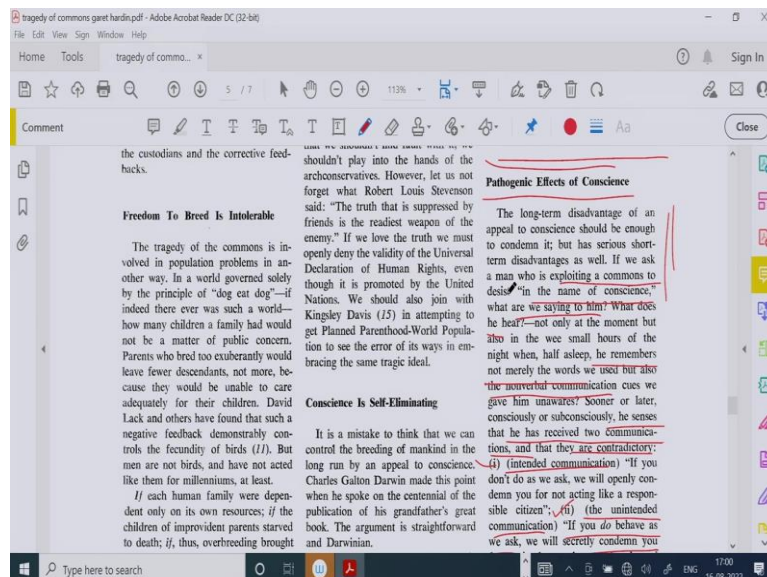
authors are talking about various kind of exploitation or utilization of resources and then how, a tragedy is there because of the freedom to use maximum. I should say the maximum utilizations of the common properties for the benefit of few. And then how, because of various activities, we create pollutions and thus the common property, which otherwise can be used by, most of the people in the society, they cannot use it, because it got polluted because of certain actions or over exploitation.

(Refer Slide Time: 33:32)



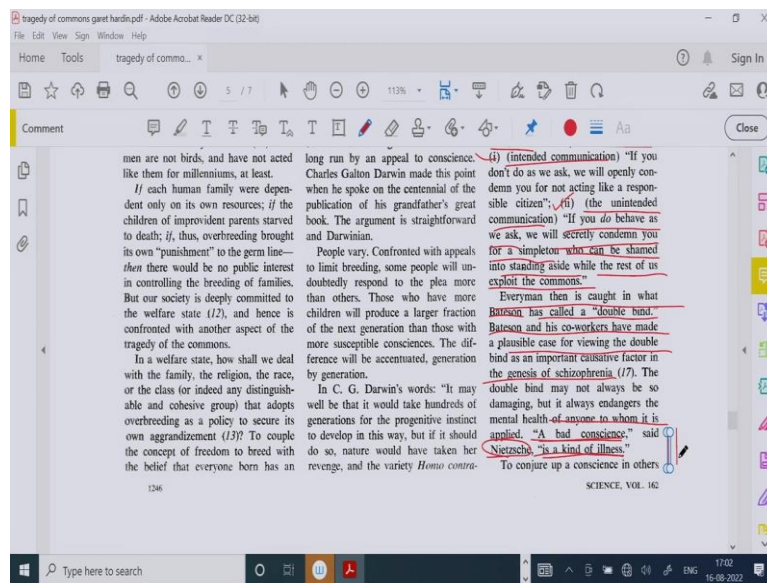
Now, then he also talked about legislations, how government can bring in legislations to regulate the exploitation of common properties. And then he talks about the population problem, how the self conscious can actually dictate the decision to increase populations or regulate it in a proper manner.

(Refer Slide Time: 33:53)



Now, conscience is a very, sensitive matter where when you communicate some message, he says, one person may get your intended message, the other person may not. So the person who actually supposed to get the message, he does not, but the other person gets and he stops, suppose, utilizing that particular common property, but then other people still continue exploiting that common property.

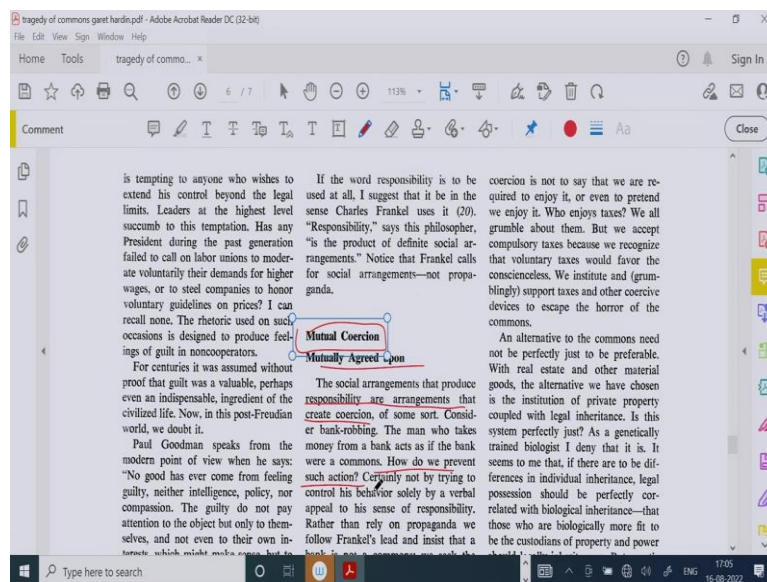
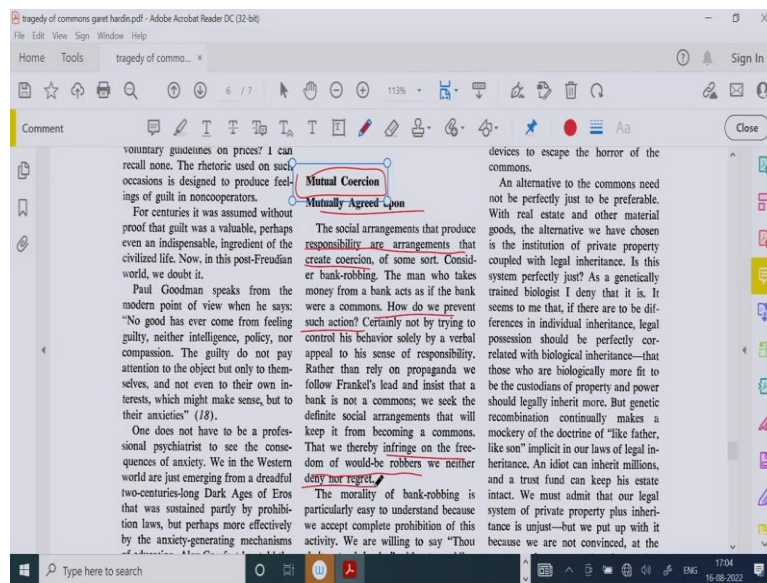
(Refer Slide Time: 34:22)



Does it help? No, it does not. So, in that case, another author, he says that a bad conscience is a kind of illness. So, it must be rectified. Very strong statement, but imagine that this kind of a very critical thinking started taking place in 1965-66, that point of time. So, even that point of time, these are the people they understood or imagined that in which direction the world is moving, and the crisis of natural resources, the conflict among different society, these things they could imagine. And that is why they warned the society that if proper care and proper steps are not been taken, then the mankind will approach towards a ruin.

But of course, we are still moving; things are still somehow being managed. But the fact is that various other natural resources are getting somehow exhausted from the ecosystem. So, perhaps the time has come, that we revisit this kind of paper written in 1960s, 65, 66, when population of this world was almost half of what we have today, or at least, much less than what we have today. So, that is what I would again, request all of you that download this particular paper and read it very carefully. So, we will continue discussing this paper.

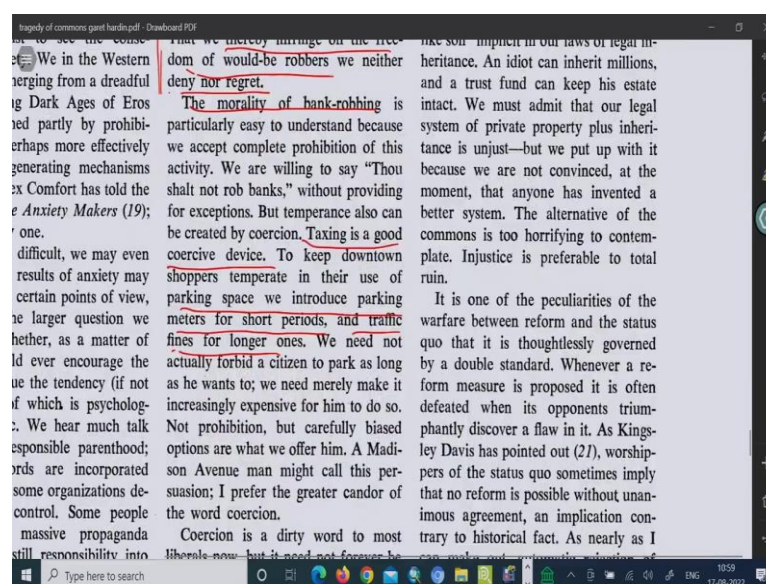
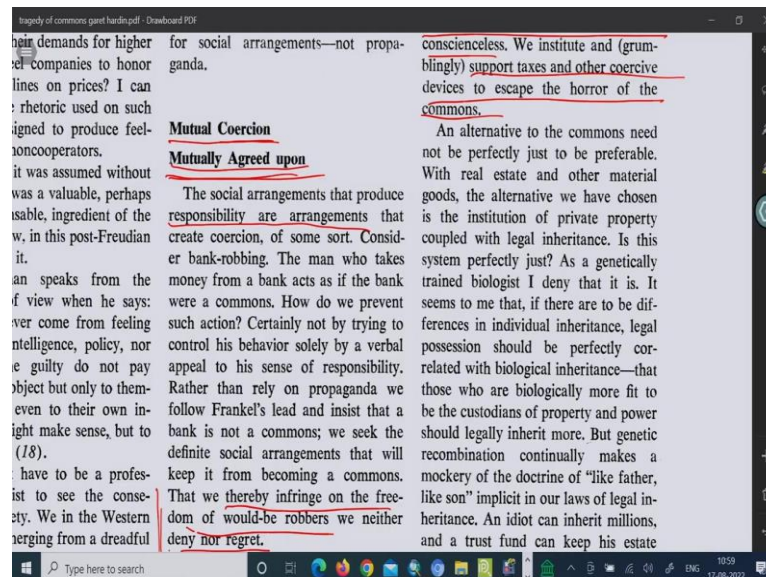
(Refer Slide Time: 35:58)

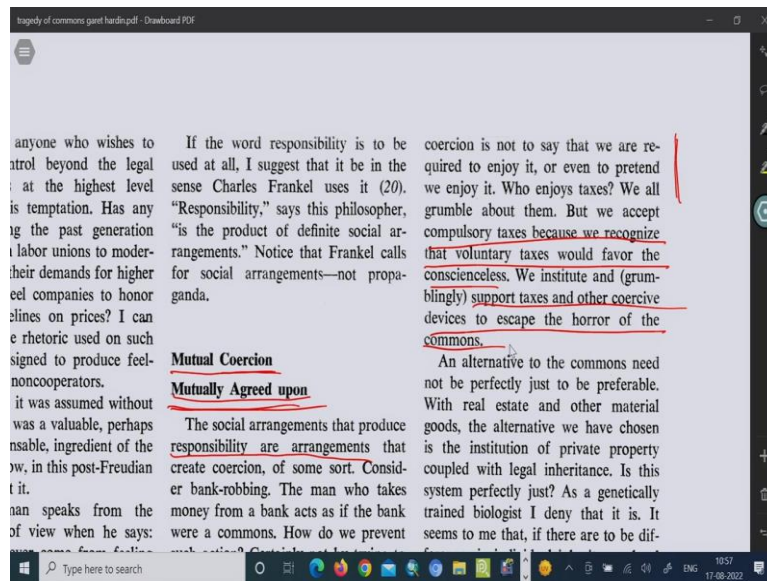


And in the next paragraph on these sections, Garrett talks about mutual coercion, mutually agreed upon system, the social arrangements, which actually produce the responsibility that create coercion. A man who takes money from a bank acts as if the bank was the commons, how do we prevent such kind of action? Certainly, we cannot do it by trying to control his behavior by verbal appeal or to his sense of responsibility rather than rely on certain propaganda. If we see that, in certain cases, a definite social arrangements can be made, which can actually keep it from becoming a commons. And thereby infringe on the freedom of would-be robbers, we neither deny and nor regret, means the bank where we put our money, hard earned money, that should not become one day like a common property.

So, the author is actually trying to, mean, that some of the resources, some of the natural resources that we have in our system, it is like stored in that system, which can be utilized as per the requirement, as part its utilization, not like that, whenever somebody wants it, just take it, from the system.

(Refer Slide Time: 37:35)





Here comes again, the point of morality that Garrett Hardin mentioned at the very beginning, that utilization, extraction, exploitation of resources from our ecosystem, largely depends on morality. Now, if the morality of bank robbing is particularly easy to understand, because we accept complete prohibition of this activity, but at the same time, we can have a system like taxing. Taxing could be a good coercive device to keep the shoppers in their use of parking space, introducing parking meters, short periods and traffic, fines for longer duration of stay.

So, that means here, Garrett is telling that directly approaching to the bank robber and requesting him for his conscious or morality, that may not work, we know that. So, instead of that, he is now thinking about certain other tools or mechanism like tax or having some kind of system which actually will allow a kind of a prohibitory system for the bank robbers to think that the bank is of common. So, if you look at that, under this kind of situation, where you mutually agreed upon certain condition of coercion; coercion is not to say that we are required to enjoy it or even to pretend that we enjoy. Tell me who enjoys tax? The taxation, anybody, any one of us enjoys it.

So, we all actually feel unhappy when we pay taxes. There are very few people maybe, who very happily paying taxes. Now, but we accept the compulsory taxes because we recognize that voluntary taxes would favor the conscienceless. Means, if you make taxing system voluntarily, the people who do not have conscious, self conscious definitely they will decide not to pay tax. So, in that kind of system in society, it will be very difficult to run the system, run the development work. So, in that kind of condition, government or countries institute and support taxes and other coercive devices to escape the horror of the commons. Means everything if we start thinking that okay this is common property, use it, then one day it will

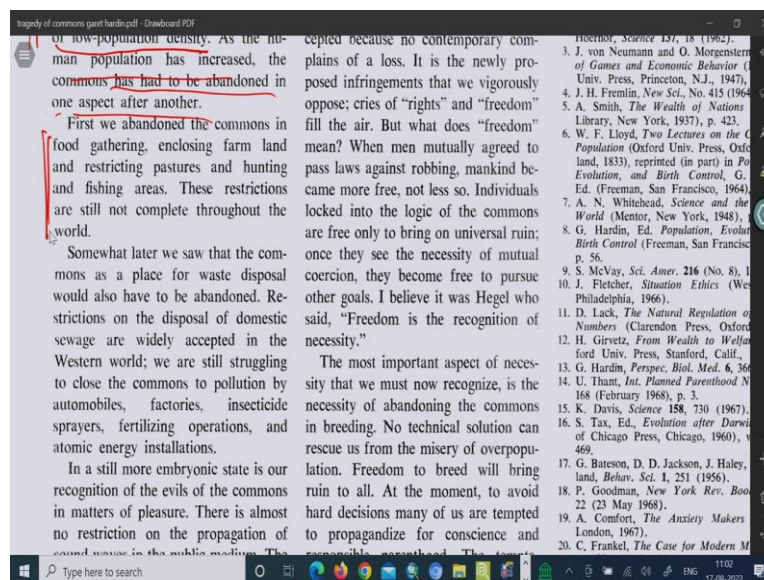
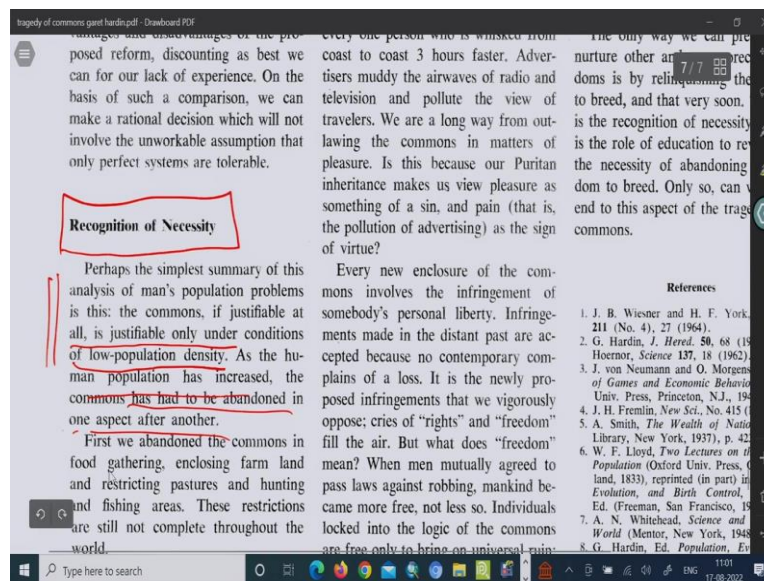
be very difficult actually to run the system to run the government, the financial ecosystem will be totally destroyed and that is why in this paper Garrett says Tragedy of Commons.

So, please try to understand that common property common sources of natural resources which are useful for our life useful many people can actually build their livelihood on that, but as long as the thinking is there that these are common properties. So, take it. I given an example, any one of you are coming from mountainous region, you might have seen that people go up there in the morning and then midday they will come down with a lot of biomass wood on their back, because they are going to use those for cooking food.

Now, these are these practices are going on for many, many years. As long as you take that much only which is required for you is still okay. But when the population is very high and everyone thinks that I am taking only little bit for me, that little bit becomes huge amount and the day will come that the entire forest is totally vanished. And that is also another tragedy of common because nobody thought of regenerating plants there. Everybody went for the readymade mature plant; sometimes even immature plants cut it, bring it home, dry it and use it for different domestic purposes.

So, the thing here that I am trying to put in front of you because we discussed in previous lecture about common property right, so, I thought that let us discuss something from a different angle and this is the paper which gives you a totally different perspective. Here, Garrett in every example, he argues strongly, that the thinking of common actually is not very good or conducive for our society to thrive.

(Refer Slide Time: 42:46)



So, if you now look at another point that he makes in this paper is that recognition of necessity. It means to understand or recognize that something is necessity, without that you cannot survive. The simplest summary of this analysis of man's population problem according to Garrett who says that commons, if justifiable at all, is justifiable only under conditions of low population density. Just now, what I said about collecting wood from the forest, in mountainous region or elsewhere as long as the population is less, you can still justify the utilizations or justify the necessity of cutting wood from the forest.

Because as the population increases, the commons has had to be abundant in one aspect or other, that is what I just said. The wood so one person, two person, three person but when it becomes 300 or so, everybody will take little amount. And but one day we will see the forest

is totally gone. So, even though you recognize that it is necessary for that particular individual, but when that number of individual the population gets increase, then again, the concept of common need to be relooked at. So, first we abandoned the commons in food gathering and closing farming and restricting pastures and hunting and fishing areas.

Because if we do not do that, then what will happen everybody will think that that pond belongs to everyone; so I can go there I can fish as much as I wish I can go there I can take 10 goat and leave them there to eat grasses. All of us we know in India, in certain village areas on nearby jungle areas, if you pass through even a high road; you will find that hundreds of cows are going through the road. Why? Because they have been have to like that to going the green pasture land, eat grasses, but when the milk comes, individual gain or profit is going to few persons or few households.

But because of a huge number of cows, again, population, one or two cows go there and eat some grasses come back, no problem it will get regenerated. But when these large numbers of you just leave them, and they grow and eat up the grass, so definitely in 1 week or 10 days, even the grasses also will get over. So, this is the point that every time if you say that it is common property, then we will end up one day losing most of the precious resources that we have in our ecosystem.

(Refer Slide Time: 45:54)

The screenshot shows a presentation slide titled "tragedy of commons" with a dark background and white text. The main text on the left discusses the abandonment of commons and the resulting tragedy. The text on the right is a list of references. The slide is displayed in a window titled "tragedy of commons.pdf - Dashboard PDF".

we abandoned the commons in gathering, enclosing farm land restricting pastures and hunting fishing areas. These restrictions still not complete throughout the world. Somewhat later we saw that the commons as a place for waste disposal also have to be abandoned. Restrictions on the disposal of domestic waste are widely accepted in the modern world; we are still struggling to use the commons to pollution by automobiles, factories, insecticides, fertilizing operations, and nuclear energy installations. A still more embryonic state is our restriction of the evils of the commons matters of pleasure. There is almost no restriction on the propagation of nuclear waves in the public medium. The public is assaulted with mind-numbing music, without its consent. Our

kill the air. But what does "freedom" mean? When men mutually agreed to pass laws against robbing, mankind became more free, not less so. Individuals locked into the logic of the commons are free only to bring on universal ruin; once they see the necessity of mutual coercion, they become free to pursue other goals. I believe it was Hegel who said, "Freedom is the recognition of necessity."

The most important aspect of necessity that we must now recognize, is the necessity of abandoning the commons in breeding. No technical solution can rescue us from the misery of overpopulation. Freedom to breed will bring ruin to all. At the moment, to avoid hard decisions many of us are tempted to propagandize for conscience and responsible parenthood. The temptation must be resisted, because an appeal to independently acting con-

6. W. F. Lloyd, *Two Lectures on the Checks to Population* (Oxford Univ. Press, Oxford, England, 1833), reprinted (in part) in *Population, Evolution, and Birth Control*, G. Hardin, Ed. (Freeman, San Francisco, 1964), p. 37.

7. A. N. Whitehead, *Science and the Modern World* (Mentor, New York, 1948), p. 17.

8. G. Hardin, Ed. *Population, Evolution, and Birth Control* (Freeman, San Francisco, 1964), p. 56.

9. S. McVay, *Sci. Amer.* 216 (No. 8), 13 (1966).

10. J. Fletcher, *Situation Ethics* (Westminster, Philadelphia, 1966).

11. D. Lack, *The Natural Regulation of Animal Numbers* (Clarendon Press, Oxford, 1954).

12. H. Girvetz, *From Wealth to Welfare* (Stanford Univ. Press, Stanford, Calif., 1950).

13. G. Hardin, *Perspec. Biol. Med.* 6, 366 (1963).

14. U. Thant, *Int. Planned Parenthood News*, No. 168 (February 1968), p. 3.

15. K. Davis, *Science* 158, 730 (1967).

16. S. Tax, Ed., *Evolution after Darwin* (Univ. of Chicago Press, Chicago, 1960), vol. 2, p. 469.

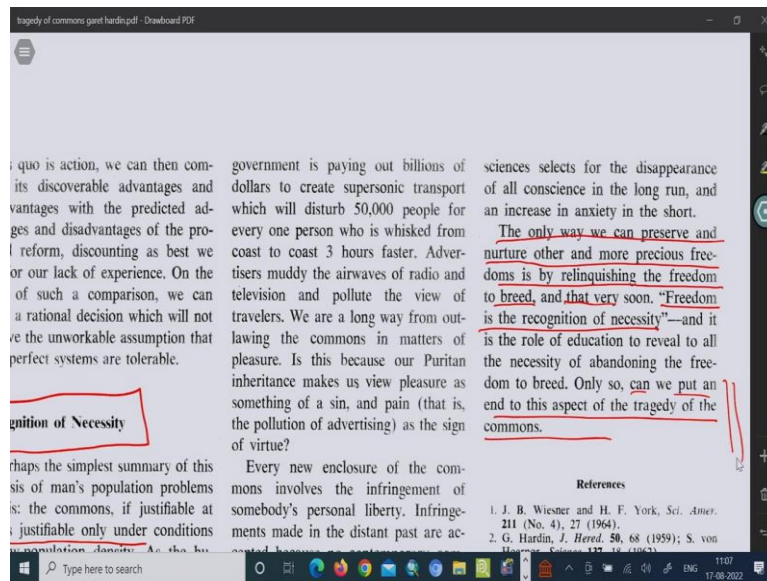
17. G. Bateson, D. D. Jackson, J. Haley, J. Weakland, *Behav. Sci.* 1, 251 (1956).

18. P. Goodman, *New York Rev. Books* 10(8), 22 (23 May 1968).

19. A. Comfort, *The Anxiety Makers* (Nelson, London, 1967).

20. C. Frankel, *The Case for Modern Man* (Harper, New York, 1955), p. 203.

21. J. D. Roslansky, *Genetics and the Future of Man* (Appleton-Century-Crofts, New York, 1966), p. 177.



So, one should actually, keep in mind that Hegel, another thinker, he said once, freedom is the recognition of necessity; very, very important statement. The most important aspect of necessity that we must now recognize is the necessity of abandoning the commons in breeding. No technical solution can rescue us from the misery of overpopulation. This is what Garrett said, and these are the statement, which at that point of time, 1965-66, actually created a hue and cry in the society. Someone coming and telling that do not produce too much.

Even at one point, he said, that if you continue producing like that way, the doomsday is not very far. So, people certainly at that point of time did not like some of his thought and ideas, statements. So, he says that freedom to breed will bring ruin to all. Just try to imagine those days, mid 60s, to state this kind of statement in United States of America is not an easy thing. Freedom to breed will bring ruin to all what actually he meant is that if you give freedom to everyone that you produce, produce and produce as many as you want. So, the population will reach to a certain level that we will fight for every resource, especially the issue with the common resources.

And then, you will find the tragedy of common. This is what Garrett Hardin has argued in these papers which actually become a famous piece for natural resource study, social study. And he also, says that, which the only way that perhaps we can preserve nurture, other and more precious freedom is by relinquishing the freedom to breed.

So, imagine the kind of statement and then he says that that is what he said, freedom is the recognition of necessity, and it is the role of education to reveal to all the necessity of abandoning the freedom to breed and he thinks; he finds only so that we can put an end to this aspect of the tragedy of the commons.

So, the final conclusion is that please do not give the freedom to breed, make the society recognize to abandon the freedom to be; means you live the freedom to breed just like anything because perhaps that is the only way that you control the population. If population is under control, then the tragedy of the common may be avoided or we may be able to end this Tragedy of Commons.