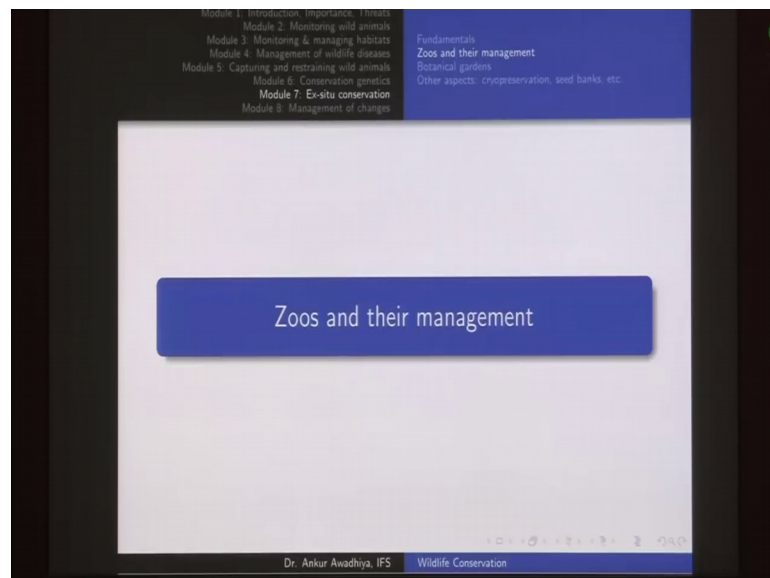


Wildlife Conservation
Dr. Ankur Awadhiya
Department of Biotechnology
Indian Institute of Technology, Kanpur

Lecture – 31
Zoos and their Management

[FL] You may have visited some zoos in some part of your life.

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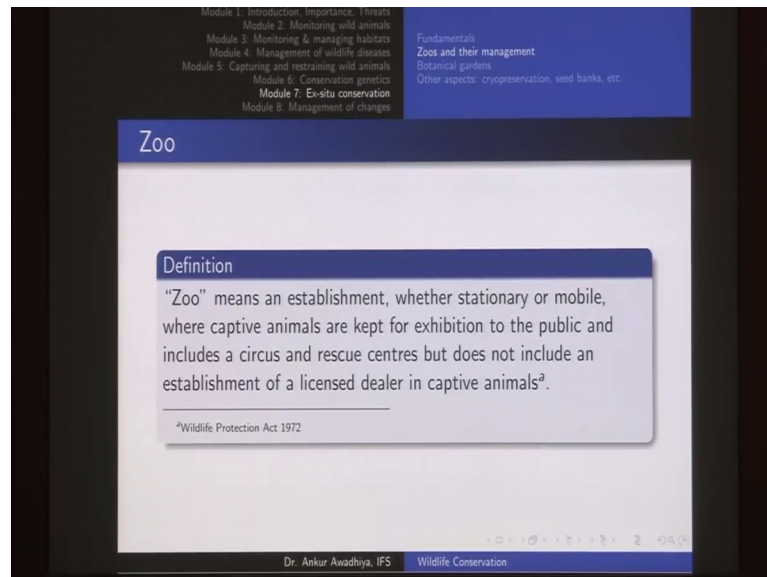
Now, zoos are places where we normally go to experience the citing of animals, but then zoos are also extremely important for us to as Ex-situ conservation facilities. So, they are not just a place where animals are dissipate, but there are also places where any rescued animal is kept or places where we do some amount of a research on these animals or also places where we perform some amount of captive breeding in these animals.

So, a number of endangered species are kept in our zoos for two reasons, one is that as a backup. So, that if the national population dwindles we still have some animals out there in the captivity. So, you would remember that where we were we were discussing about the IUCN redness categories we have 2 categories extinct and extinct in the wild.

So, when we consider this category of extinct and the wild we mean that this is species or this taxon has become completely extinct in the wild situations, but we still have those in captivity. So, these could then be used to restock a population to reintroduce these

animals into their national habitat once their conditions have improved. So, that is one reason as a backup and second is as a captive rearing facility if you want to increase their numbers.

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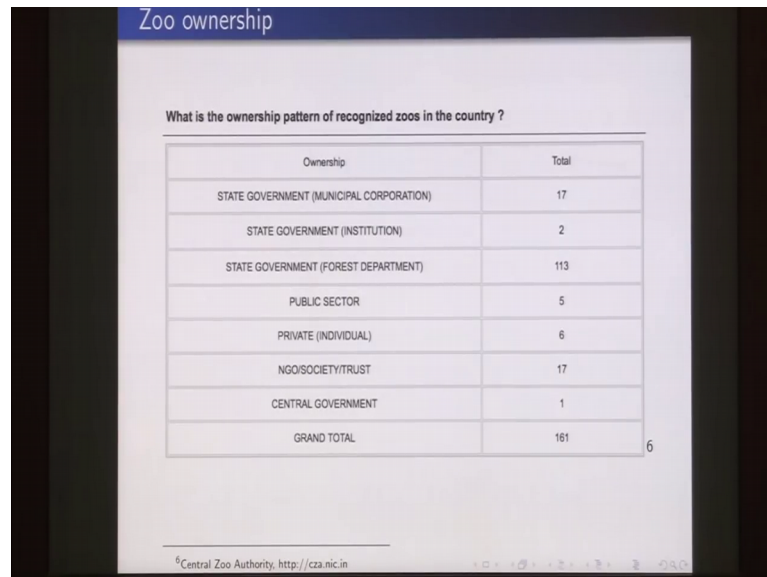
So, let us begin with the definition of a zoo as perhaps by wildlife protection act 1972. Zoo means an establishment where whether stationary or mobile where captive animals are kept for exhibition to the public. So, we could have stationary zoos and we can also have mobile zoos and which were more prevalent in antiquity, but are now less prevalent, but captive animals are kept for exhibition to the public. But then it also expands this definition by saying that and includes a circus.

So, a circus is the zoo as per the definition under a wildlife protection act and rescue centers. So, rescue centers are also zoos now, why is this demarcation is important? Because, when we say that we would have certain laws or certain regulations that are related to a zoo when those laws and regulations will also apply to circuses and also to the rescue centers.

So, for instance if we say that we should have a minimum size of the inclusion for keeping any animal or we should have n number of (Refer Time: 02:39). When we are keeping so many animals or when we say that whenever an animal needs to be moved from place a to place b then such and such regulations would apply for in the case of zoos. So, the same regulation would also apply to a circus and the same would also apply

to rescue center that does not include an establishment of a licensed dealer in captive animals. So, these kinds of facilities are not included in the definition of zoos. So, if there is a licensed dealer in captive animals then we will not call it a zoo.

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Ownership	Total
STATE GOVERNMENT (MUNICIPAL CORPORATION)	17
STATE GOVERNMENT (INSTITUTION)	2
STATE GOVERNMENT (FOREST DEPARTMENT)	113
PUBLIC SECTOR	5
PRIVATE (INDIVIDUAL)	6
NGO/SOCIETY/TRUST	17
CENTRAL GOVERNMENT	1
GRAND TOTAL	161

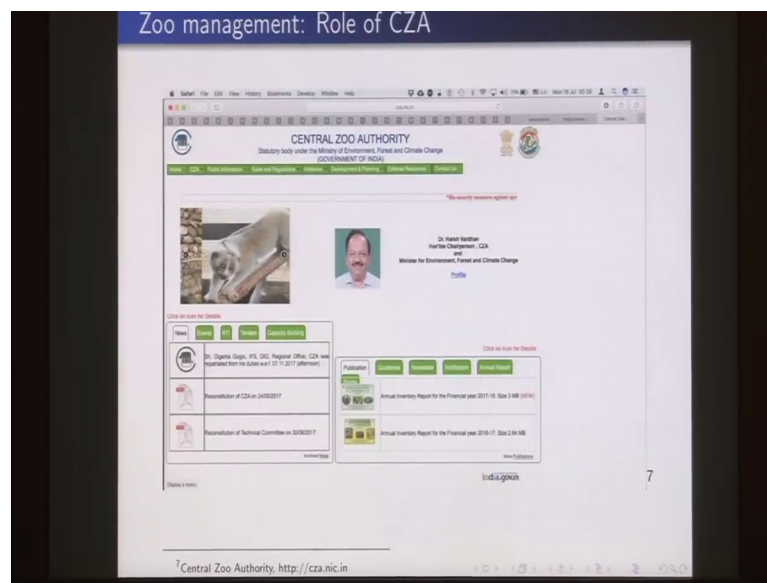
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Central Zoo Authority, <http://cza.mic.in>

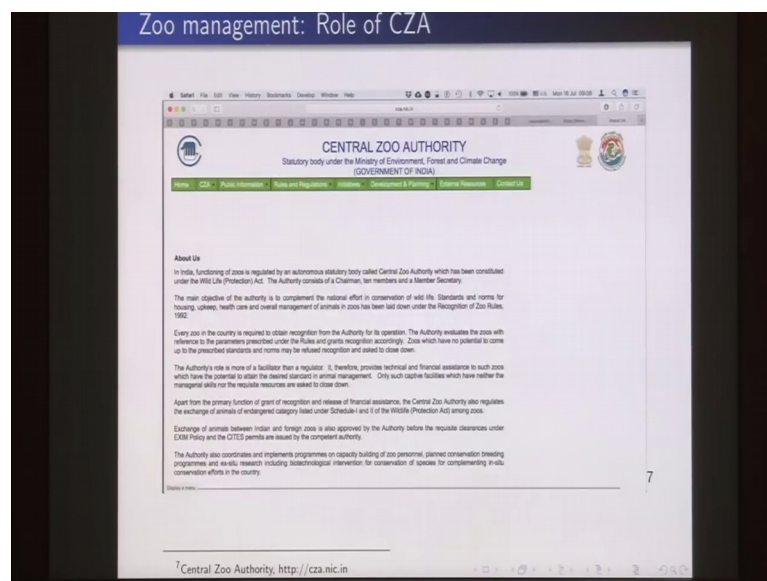
In our country we have zoos under the ownership of different authorities. So, we have municipal zoos these are 17 in numbers. So, these are the figures as on March 2018. So, we have municipal zoos, we have state government zoos that belong to some institutions. We have state government zoos that belongs to the forest department, these are the largest categories of the zoos, then we have some zoos in the public sector, we have some zoos in the private sector.

Then we have some zoos that belong to some NGO's or society or trust then there is only one central government zoo in Delhi. And so, the sum total of this comes to 161 zoos in the country and all of these zoos come under the authority of the CZA or the central zoo authority

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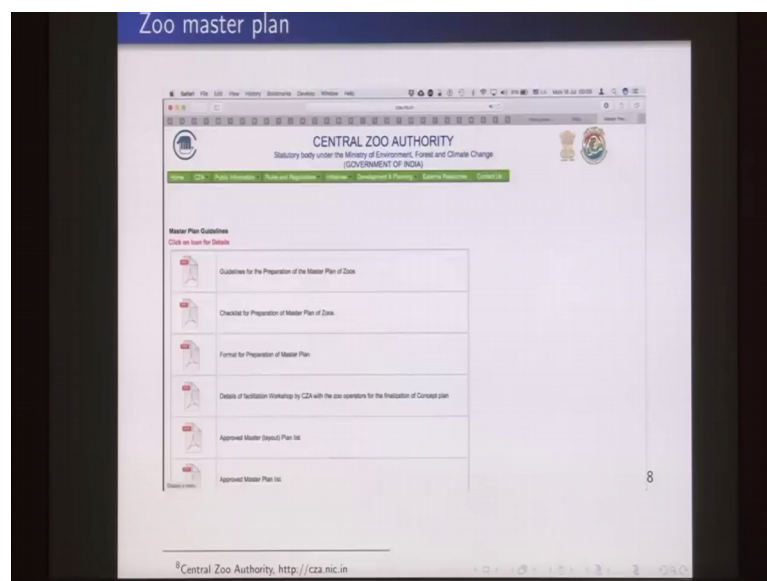
Now, this authority performs a number of functions, one it recognizes the zoos so, when we say that a zoo is recognized. So, it is granted certain privileges, it is granted a permission to remain open. So, it grants these privileges so, 1st is recognition of zoos, 2nd is classification of zoos. So, zoos are classified as large zoos, medium size zoos and smaller zoos. Now, for all of these different categories of zoos we will have certain

requirements. So, in the case of a large size zoo you should have this much amount of area these many number of animals and so, on. So, CZA also categorizes these zoos.

Then it also performs a regulatory role on the zoos. So, time and again officials from central zoo authority would visit these zoos and then inspect these zoos whether they are performing well or not if there are any problems they would point them out ha to be corrected and so on, if not then their zoo may lose it is recognition. Then it also performs a role of a facilitator.

So, facilitator in terms of getting more funds for these zoos, facilitation in terms of getting more scientific innovations or more technological interventions into these zoos then if there is captive breeding facility then CZA would come up with a guidelines inspects those as well. If there is any movement of animals from one zoo to another zoo, if there is any import of animals that needs to be done, if there is any export of animals to another country then all of those are also facilitated by the central zoo authority.

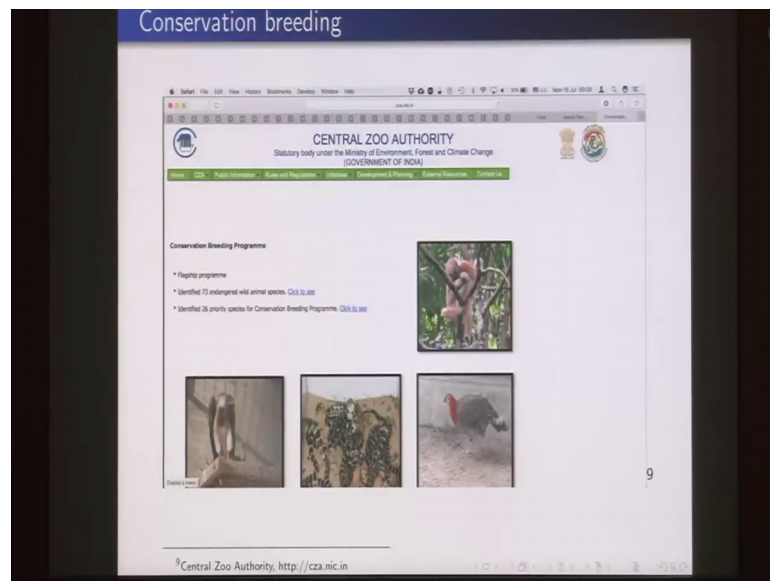
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And its role, it also waits them master plans for the zoos, it has come up with a number of master plan in guidelines. Now, master plans are those documents in which we do all the planning of a zoo. So, essentially what sort of facilities need to be developed, what are our current facilities, what all facilities need to be upgraded, what do we want to say in the next 5 years.

So, all those things would come up in the master plan. Even things like if there is any emergency, how are we going to evacuate people, how are you going to evacuate the animals, if there is any disease outbreak what is going to be our stands, what are all what are the facilities that are available for us to deal with a disaster. And so, all these planning aspects come up in the master plan and then this is also waited by the CZA.

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The screenshot shows the BENGAL TIGER Studbook. The title is 'BENGAL TIGER Studbook (Numbers 1 to 10)'. Below the title is a table with the following columns: Stud #, Sex, Birth Date, Sire, Dam, Location, Date, Local ID, Event, Name, Breeder, Sire ID, Dam ID, New Reg. No., and Sire/Dam ID. The table lists 10 tigers with their respective details. The footer of the website displays 'Central Zoo Authority, http://cza.nic.in'.

Stud #	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Name	Breeder	Sire ID	Dam ID	New Reg. No.	Sire/Dam ID
1	M	~ Aug 1950	WELD	WELD	BDNA	27 May 1951	1951	Capture	BDNA	CZAZ 1	1	1	1	1
2	F	~ 1950	WELD	WELD	BDNA	26 Nov 1952	1952	Transfer	BDNA	CZAZ 2	2	2	2	2
3	M	7 Sep 1953	1	2	BDNA	7 Sep 1953	1953	Birth	BDNA	BDNA 1	1	2	3	3
4	M	7 Sep 1953	1	2	BDNA	7 Sep 1953	1953	Birth	BDNA	BDNA 2	2	2	4	4
5	M	10 Apr 1955	1	2	BDNA	10 Apr 1955	1955	Birth	BDNA	BDNA 3	3	2	5	5
6	M	10 Apr 1955	1	2	BDNA	10 Apr 1955	1955	Birth	BDNA	BDNA 4	4	2	6	6
7	F	10 Apr 1955	1	2	BDNA	10 Apr 1955	1955	Birth	BDNA	BDNA 5	5	2	7	7
8	F	10 Apr 1955	1	2	BDNA	10 Apr 1955	1955	Birth	BDNA	BDNA 6	6	2	8	8
9	M	10 Jul 1956	1	2	BDNA	10 Jul 1956	1956	Birth	BDNA	BDNA 7	7	2	9	9
10	F	10 Jul 1956	1	2	BDNA	10 Jul 1956	1956	Birth	BDNA	BDNA 8	8	2	10	10

Then the CZA also helps in the creation and running of the captive breeding facilities for a number of animals. It also main helps in the maintenance of the stud books, now this is

an example of the tiger studbook. So, essentially what a studbook contains that it would have a stud number, the sex of the animal when it was born, then how was it sired.

So, sired means whether it was born out of a wild tiger or whether it was a part of the captive breeding, then you have that dam. So, size differs to the father, dam differs to the mother who was the mother was it one of the wild animal means over was it one of the earlier animal that has been required to here in the case of the captive breeding. Then what was the location in which it first born or where it was captured then at different dates.

So, here we have different dates and then what was the event that happened with this animal? So, for instance the first animal that is referred to here is a famous tiger Mohan. So, Mohan was the first white tiger that was captured in the in the place called Riva. Now, this animal was captured in 1951 and then it was transferred on 27th of May 1951 and then it died on 19th of December 1969.

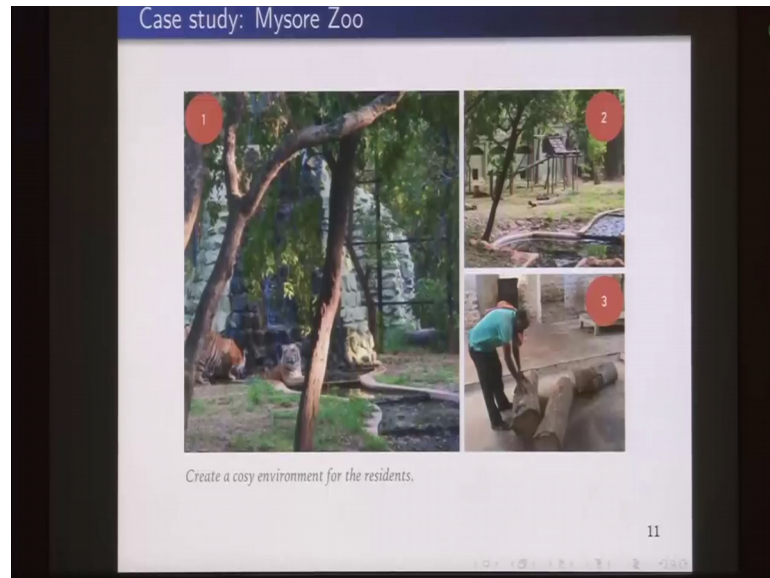
So, essentially we have a record of this animal. Next, we have the name of this animal, then who did the breeding and then some other tax that are used to tell us the old registration numbers, new registration numbers and so on. Now, why is the maintenance of the studbook important? Now, this is important because in any of our captive breeding facilities we want to minimize in breeding as far as possible.

Now, here we have the first tiger which was Mohan that was captured in the wild and then we have the second tiger called Begum, it was a tigress it was a female that was also captured in wild. Now, for instance if you look at this tiger number 6, the tiger number 6 is a male it was born on the in the year 1955. And then here we see that it is father was number 1, number 1 is Mohan, the mother was number 2, number 2 is Begum. Now, for some other animal say animal number 10, this was a female and this also at this same parents. Now, this animal was then transferred to some other zoo.

So, this animal was there in the drill in the Delhi zoo and this animal number 6 was there in the Ahmadabad zoo. Now, if we are doing any captive breeding operation and we would want to bring animals from as far as possible, but then even these animals where there in Ahmadabad one I was there in Delhi both of these angles are related. So, how do we get to know about this information? This only possible when we maintain this

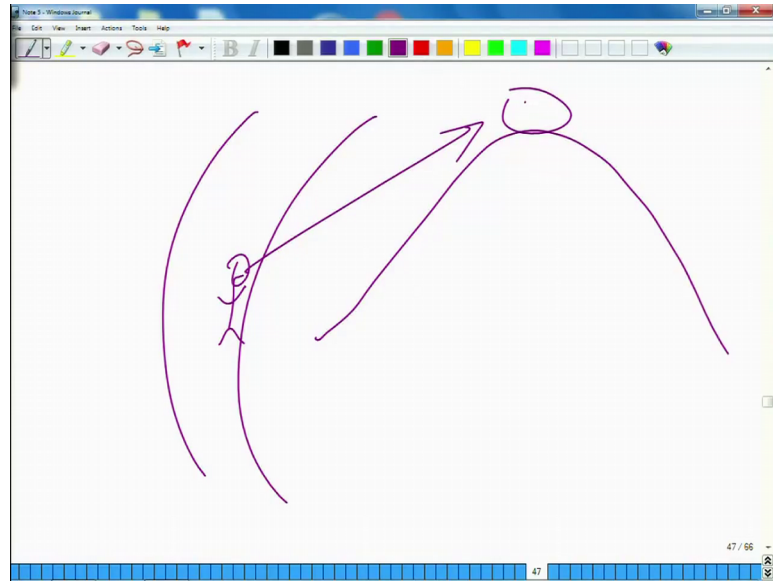
documents in the name of studbooks and these studbooks are also maintained by the CZA. So, that is about the illustrative part what actually happens in the zoos?

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So, we go there we see the animals, but that is then what is going on in the background? So, we will take the case study of the Mysore zoo as an example of what actually happens in a zoo. So, one primary concern in a zoo is to create a cozy environment for the residents. So, if we observe these tigers so, these tigers have given ample amount of space there is a small water fall here. So, that this area is kept cool, we have quite a number of trees are there so, that this angle gets a shade. We also try to ensure that these animals are kept at an elevated position as compared to human beings. So, what we mean by that is that if we have this is a pathway.

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So, we would have an elevated ground on which the animal is kept. So, people when they are observing the animal they are looking up to the animal. Now, why is this important? Because, psychologically if an animal is looked down upon. So, if you are always looking down at the animal the animal gets a feeling of threat.

So, there is one way which we try to ensure that even psychologically the animal is in a cozy environment. Now, similarly we would have places for the animal to sit embarks in the sense if required. We would also have some shades we would also have some other shades in which this animal may go inside and hide in privacy, if it does not want to come out, if it does not want to display itself. Inside these chambers we would always have things with this logs. Now, this logs are important because in the case of tigers they have a habit of scratching with the nails.

So, they should have some surface on which to scratch if they are only kept on a concrete surface and if they are trying to scratch something they will break their nails, but if you have a soft items such as log of wood then that helps. So, these are some primary consideration that we need to take care in the case of the zoo.

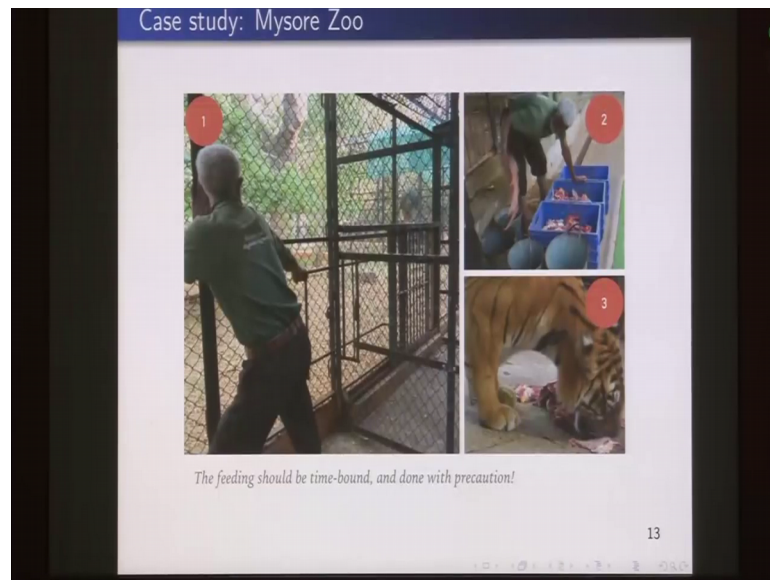
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The second important thing is quality feeding. So, for instance if your zoos having snakes you would be feeding them with mice so, these mice are then reared in the facility and there is a veterinarian to check that these mice are healthy and fit enough to be eaten by this snakes.

And in the case of other animals you would have a number of raw materials that are brought in, number of fruits and vegetables that are brought in. There are quite some grains that are kept stored in this facility. So, the quality of all of these whether there is any thermal attack on any of these food grains all of these need to be checked at regular intervals.

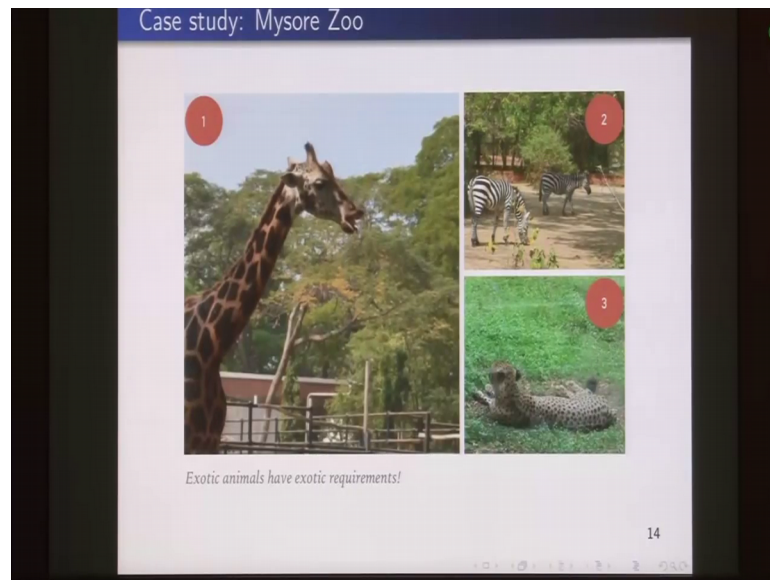
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Now, once you have ensured that your feed is a quality feed makes you need to ensure that your feed is given to the animals in time. So, here animals must not be over fed or underfed. If your animals is overfed it would become obese that it will also lead to other diseases such as diseases of the joints. If the animal is underfed it might starve, when it is starving then it might not be showing it is lacking behavior it might also not breed.

So, the feeding has to be done in time log manner and it has to be done with a lot of precaution because you are dealing with animals such as tigers which are ferocious animals. So, here we observe that this person is running the gate that has this inclusion on one side and the feeding chamber on the other side. So, when this gate is open the tiger would come from the inclusion it into the feeding chamber, but then there is also called quite a lot of protection. So, that the tiger is not able to mall the zoo keeper.

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Now, for our indigenous species it is easier, but when we are keeping any exotic species such as giraffes, zebra or cheetah. Now, these are exotic animals these are animals of African origin and this animals are found in Africa. Now, the situations in Africa are quite different from the situations in India. So, for instance a giraffe might be a particular feed which is feed which is not available in India.

So, when you are keeping such an animal's you also need to keep in mind that you need to provide habitats that are suitable for these species. So, for instant they the grass that is used here might be different from the grass that you use for our Indian animals. And similarly the feed that is provided to these animals is very carefully regulated.

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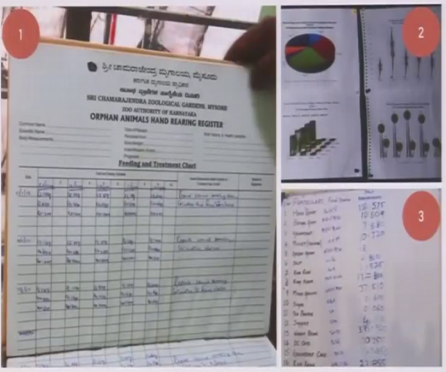
Now, these days zoos also need to take care of the landscaping because what happens is that if you have an aviary. So, an aviary is a place where birds were kept and you are having these wire machines. So, that the birds are not able to fly out, but then there could be a number of insects that may get inside now a number of birds are insectivorous birds.

So, if I get if an insect gets inside a cage the bird is going to feed on it now if an because you have these wire machines insects are inhabitive going to get inside the facility. So, in that case we need to ensure that these insects are healthy and these insects are not going in a any diseases. So, for that purpose landscaping is important.

So, that we consider the direction of winds that is coming to this area and in that direction we grow a number of plants to a very long distance. So, that we ensure that there is no garbage dump on which are these insects would have sat on and they brought their diseases. So, we would have a number of planning tress a number of plants with flowers so, that you have a good amount of a insects and a good amount of healthy insects so, landscaping also becomes important.

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Case study: Mysore Zoo




What cannot be measured cannot be managed! Need for proper documentation.

16

Next is documentation, so, any of these Ex-situ facilities have to rely a lot on documentation and this documentation is not just things like the feeding entreatment charts of animals. But also quite a number of information has these days to be converted in to visual information to be given to other people.

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Case study: Mysore Zoo



Capacity and infrastructure building for the beasts.

17

Next, we need to have proper veterinary care facilities for the animals. So, will it get this picture of the royal heritage these cage and immobilization module, but then you need to

have facilities where you can handle your animal. So, for instance if you have a tiger or a lion you need to handle that animal, you need to provide it with certain medicine.

So, it require a space cage we also require an operating theatre if there is any injury to the animal which needs to be operated upon, we also need to have any extra facility. So, you can observe that all of these animals are also given the state of the art facilities. So, this is another reason why when whenever we are thinking about an Ex-situ conservation facility the cost typically escalate.

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Case study: Mysore Zoo

1


List of In-Reach Programme 2015

No	Date of Visit	Name of the Institution	Field Visitation No
01	18-11-2015	ADG and Senior Range Officer Mysore of South Division	Department Office
02	19-11-2015	14 Members, Vittal Mallya College of Engineering, Bangalore, Mysore	Department Office
03	20-11-2015	15 Officers as a part of National workshop on conservation of the diversity in Mysore Wildlife - Wildlife Development Department, Project Director, Bangalore	Department Office
04	24-11-2015	50 + 2 Teachers, Govt High School, Kalyanagowd, Mysore	Field Visit
05	08-12-2015	50+ Teachers, Government (Kannada) Higher primary school	Field Visit
06	12-12-2015	135 Members, Range Forest Officer Mysore's Mysore Ganga, Mysore	Department Office
07	15-12-2015	50+ Teachers, Govt High School, Kalyanagowd, K. S. S. S. Mysore	Field Visit
08	26-12-2015	100+ Members, Mysore Wildlife Department	Field Visit
09	08-01-2016	100+ Members, Mysore Wildlife Department	Field Visit
10	08-01-2016	100+ Members, Mysore Wildlife Department	Field Visit
11	27-11-16	100+ Members, Mysore Wildlife Department	Field Visit
12			
13			
14			

2



3



Research and in-reach activities are essential for management.

18

Next, we would require facilities for research and in reach. Now, in reach means that you would have quite a number of peoples say you would have politicians that are visiting this zoo. And you need to facilitate their visit because ultimately those are the people who are going to create loss for the country and also loss for the zoos.

So, if those people who are in a decision making role if they do not understand what actually is required in a zoo they might not be able to form this loss properly. So, similarly a people such as judiciary, so, judiciary needs to come into zoos to understand how as we have being run and what are the pros and cons of different strategies.

So, for instance if there is consignment of turtles life turtles that is captured somewhere by people in the customs and those turtles need to be rescued. Those cannot simply say

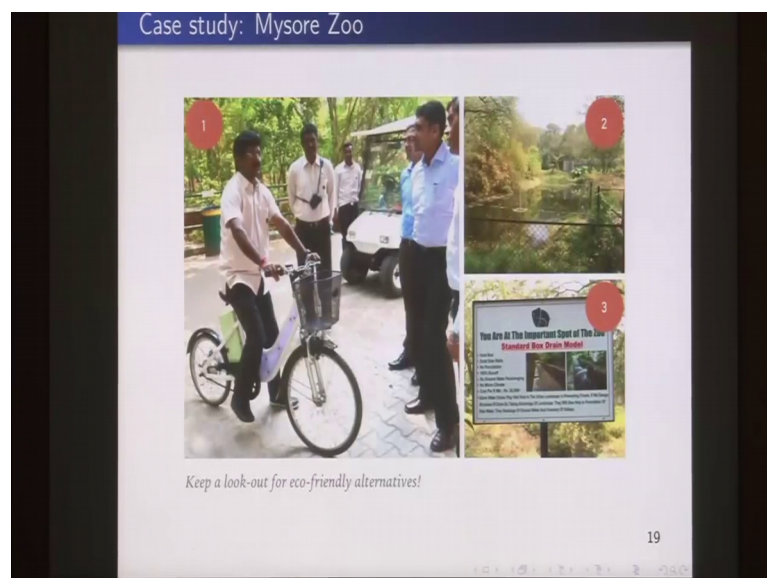
that all these turtles need to be kept in ends so and so zoo because, that zoo might not have the facility of keeping those turtles.

So, if you require these facilities time and again then it is necessary to create this facilities in the zoo. So, which is why people in this decision making roles need to be call to these zoos and need to visit these facilities to understand things properly.

Similarly, when we talk about people such as veterinarians or the officers of the Indian forest service. So, when they are going to manage all these facilities they need to have an introduction to these facility, how these facilities are being run today. So, these are the sorts of in reach programs that are regularly conducted in most of the zoos. Then quite a lot of research also goes on because, in the case of these ex situ facilities you are having a chance of very close encounters with the animal.

So, you can observe these animals at a very great detail, what are their natural behaviors; if you are giving them some feed what sorts of feed do they eat, if there is any change in their feeding habits is that indicative of any disease. Now, all these things can be looked at very intricately and so, this is also facilitated in a number of zoos.

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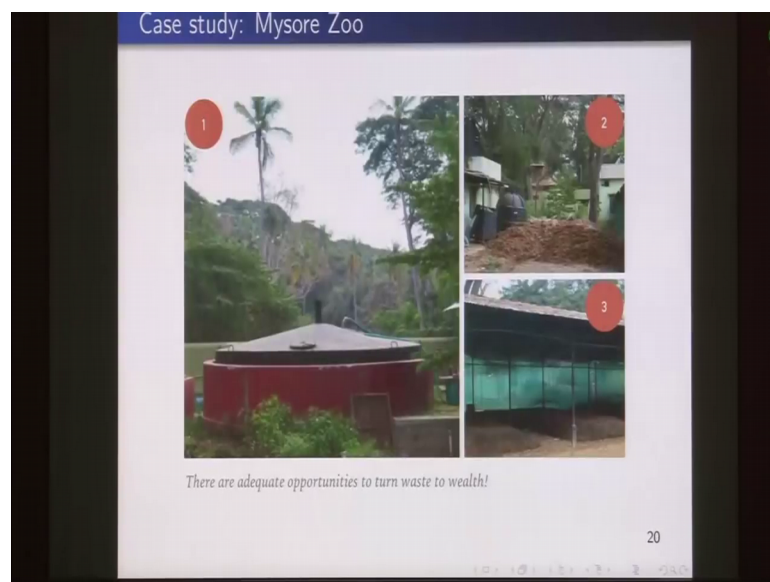


Then the next thing is that because these are facilities that have quite a good amount of finding and also because they are primarily for the cause of conservation. So, we can also develop some more ecofriendly activities. So, for instance in case your zoo has a very

large area and people have been using say buses to move inside the zoos. So, can we have some more ecofriendly alternatives such as this bicycle that runs on a battery so, in which case you will have less amount of emissions that are coming out. And remember that zoos are primarily a place for which at which you are displace the animals.

Now, when people want to go and visit these animals they will move on some vehicles so, can we go for some more eco-friendly alternatives. Similarly, can we when we talk about drainage of these areas? Can we have those drains that do not pollute the ground water? Because, most of these animals might also be using some (Refer Time: 18:14) that may result in zoo in zoo losses.

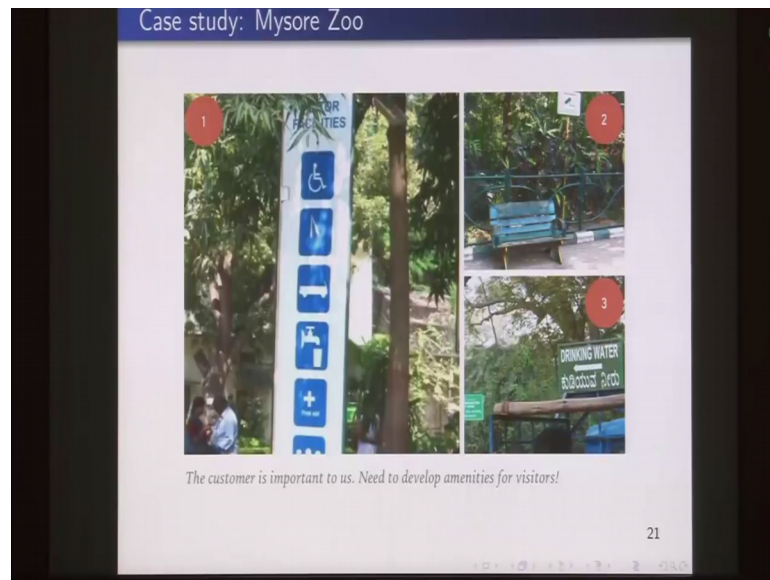
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So, things like these also need to be taken care off. Then when we consider a zoo there would be quite a large number of animals these animals would be giving out quite a large amount of dung. Now, what do we do with all these all this wastes? Can we convert it in to bio gas? Can we convert in to some manures?

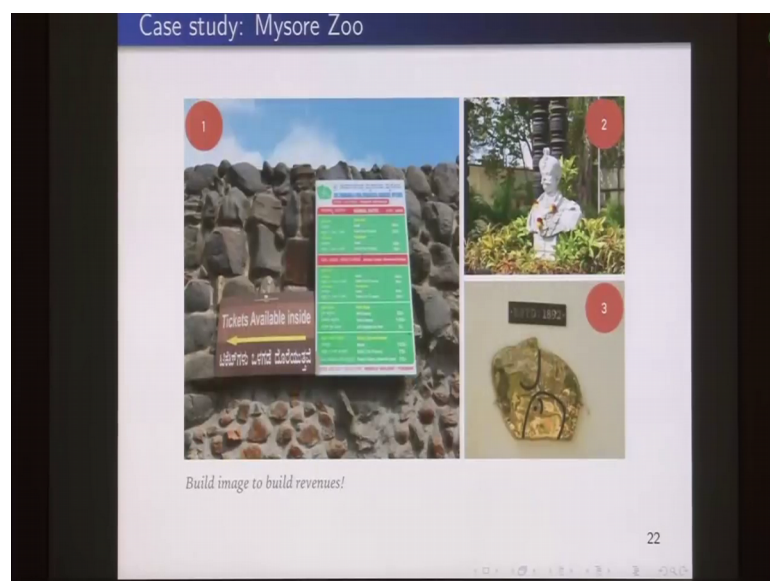
So, that is also something that needs to be done in a zoo at all times. Because, these are not activities that are incidental to the functioning of zoo, but these are activities that are core when we are considering or when we are wanting to keep any animal in the facility.

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Then when people are coming in to the zoo you will also need to do a lot of tourism management, a lot of people management so, they needs to be an amenities for people. So, for people with special requirements you might require wheel case for instance, for old people you might require some vehicles, then you need to have facilities for what do you need to have public conveniences, you need to have first aid facilities and so on. When people are moving inside the zoos you need to have places for them to sit, you need to have drinking water facilities, you need to have e trees and other stuffs.

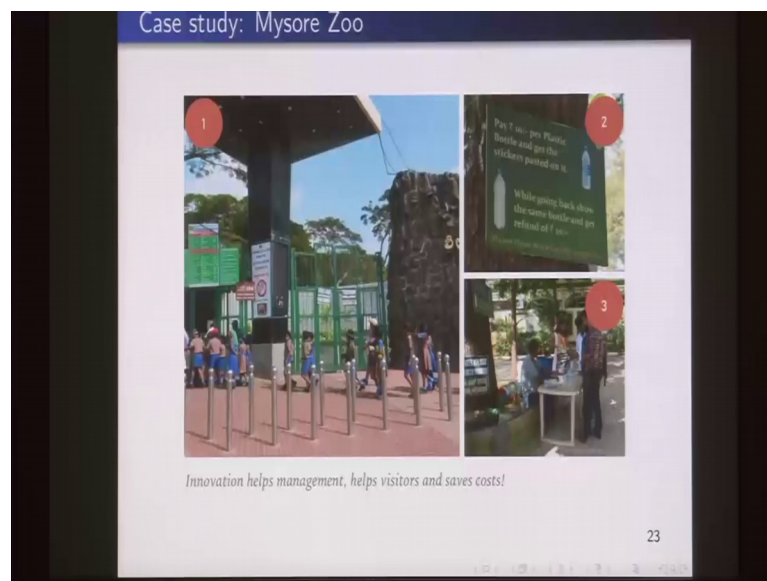
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Next you need to have any image for the zoo. So, for instance when people are getting into this area and if this area looks a very ramp shack area people might not come in to the zoo. Now, people coming to our zoos is important not just for the purpose of revenue, but also because this is one prime area in which we can bring people into the full of conservation. So, for instance later on if there is a debate whether we should have more amount of development or more amount of conservation.

And if people just do not know what sorts of animals live in our jungles, if people just go out know what conservation mean and if people just do not know that that this amount of development is going to lead to the extension of these species. If they are not emotionally attached to these species then it will become very difficult for the conservation to conserve these animals because, after all in a democracy we require public support. Now, if we have to want more and more people especially school kids for instance to come into our facilities we need to ensure that the facilities are also top class.

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Now, in that case we also need to have a lot of movement management. So, when school kids are getting into these areas you need to ensure that they are not exposed to a lot of heat, they are not exposed to a lot of sun the ticketing facilities take the minimum amount of time. And at the same time people are also given an exposure of the do's and do not's in a very intuitive way. So, for instance this is a board that is kept there in the zoo and there is a person who sits here.

Now, what this board says is that if you are coming in to this zoo and you if you have a plastic bottle. Now, people would normally come with plastic bottles because zoos was a large area and when by walking people will might get thirsty even though we have drinking water facility. But, then if you are if there is a person who has come inside with a bottle what should he or should she do with the bottle? Should he or she throw it out?

If they are throwing it out where should they throw it? Because, remember we are talking about an ex-situ conservation facility. If people just throw things here and there then there might be say monkeys around who take it and then put it in to an enclosure so, that may also result in an emergency situation.

So, what this person is doing here is that if you come inside with a plastic bottle, he would just put in a sticker on this bottle and he would charge you 10 rupees for that. And then when you are going out of the zoo you need to come to this area again. If you show him this bottle with the sticker he will get your 10 rupees back. Now, this is a very intuitive way to ensure that people do not leave their plastic bottles inside the zoo because there is a financial environment here.

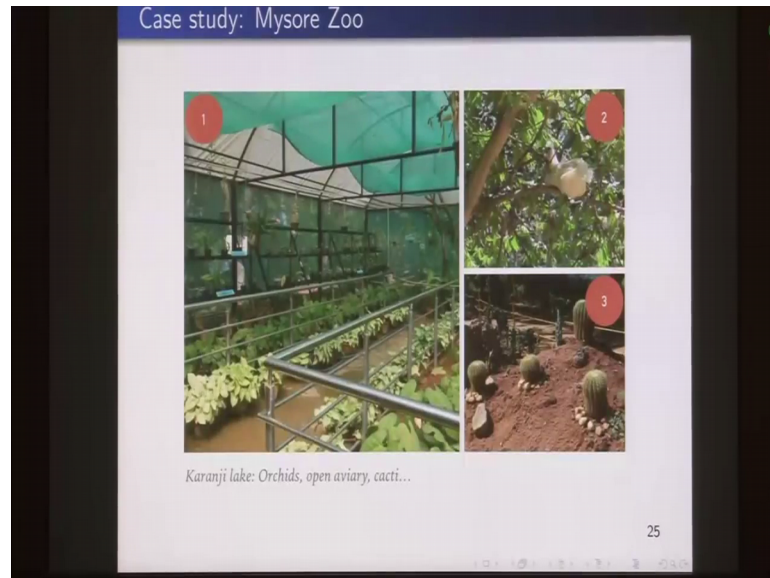
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Now, not only our animals displayed, but zoos also have areas where they have these morning walk and evening walk facilities in which they are showing all these palm trees. Then at the this in turn they have areas in which you can observe the butterflies in which

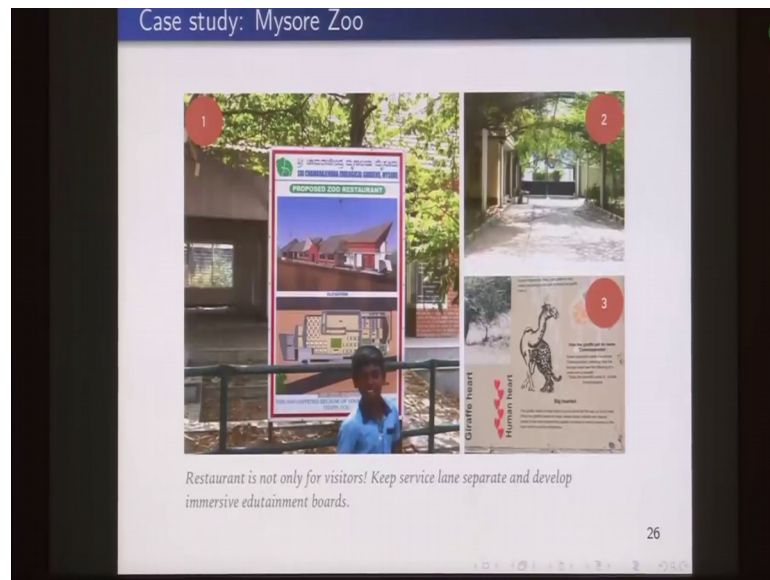
you can observe these plants such as the bryophytes or the hydrophytes. So, such kinds of plants are also displayed not just the animals.

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We also have facilities in which you have you can observe different kinds of orchids that grow in your country or you can have an this open aviary in which you can get inside. So, your are covered with that net, but when you go inside you can directly have a look at these birds or you can have a look at different kinds of cacti. Now, why is this important? Because, we have we just do not want to display our animals, but we are, but we want people to appreciate though various kinds of bio diversity that exists in our country and why all these need to be conserved?

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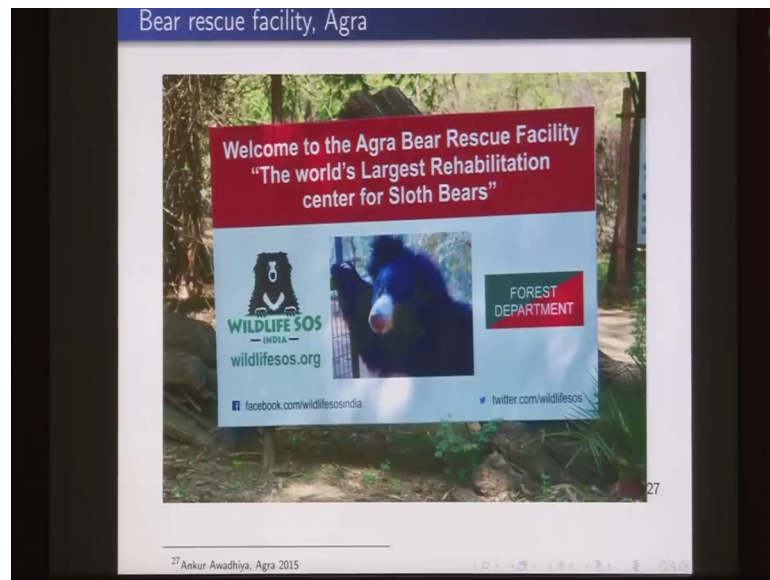


Then even things such as e-trees need to be planned in a very proper triangle because in the case of restaurants if for instance, if people are allowed to bring in their own food and if they drop this food some way walking on the park trees. So, there could be some animals that would pick this up and may be bring it out to there to the enclosures. So, restaurants also become an integral part of the zoos.

Similarly, you need to keep service lanes separate so, that while the animals are being provided with their rations or by animals have been transported, the movement of a of people does not get hindered,. Then at all times our aim is to put people into the conservation food so, immersive display boards are important.

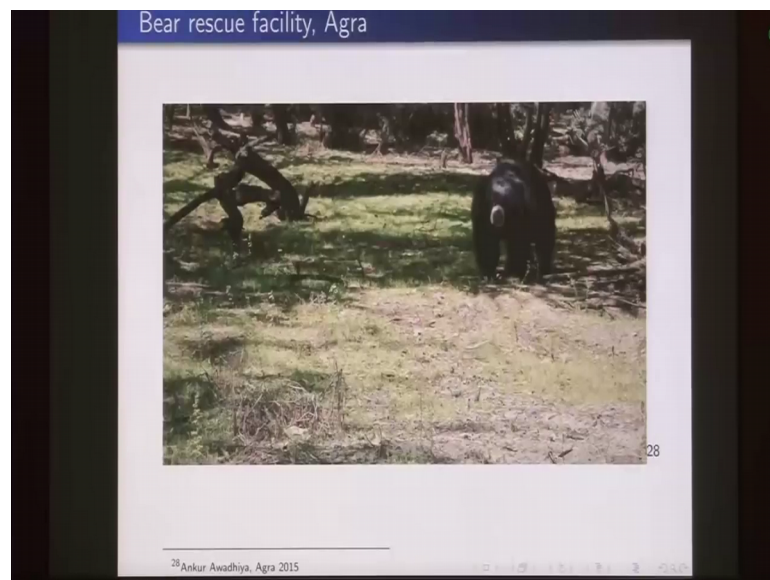
So, for instance if you have a look at the giraffe then the question would be how high is this giraffe? What is the size of it is heart? Or for instance when you look at it is scientific name it is called a giraffe camelopards. Now, why is it called camelopards? So, if you give information such that this giraffe looks like a camel and it is skin looks like a leopard so, it is camel plus leopard so, it is camelopards. So, things like that engage people and especially the school kids so, that they are more attuned to the cause of conservation.

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Now, rescue facilities they also come under the definition of zoos. So, we have rescue facilities for the rescue of sloth bears.

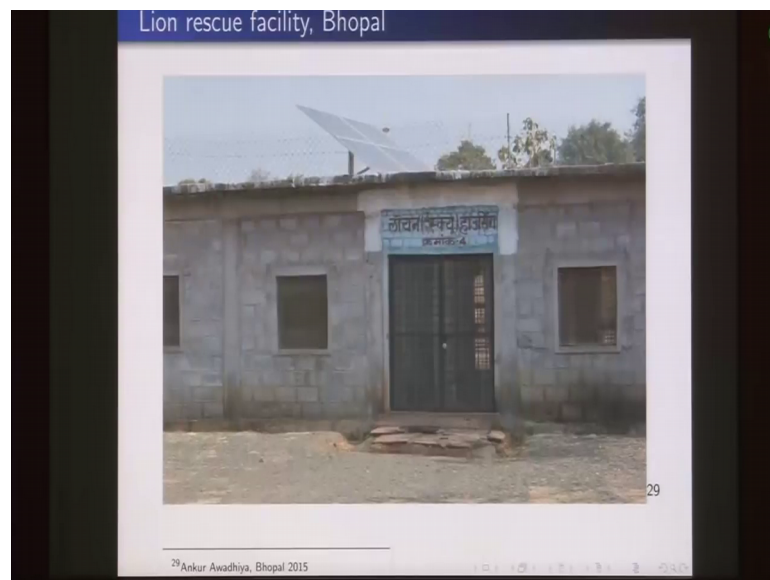
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Now, these bears were earlier used by bear dancers that go by the name of colonnades. Now, when this profession was out a lot and all these bears had to be rescued. So, most of these bears cannot just be released into the wild why? Because, when these bears were put into this trait of bear dancing. So, their claws were removed, their teeth's were removed, their noses were pierced and there was rope that bent inside. A number of

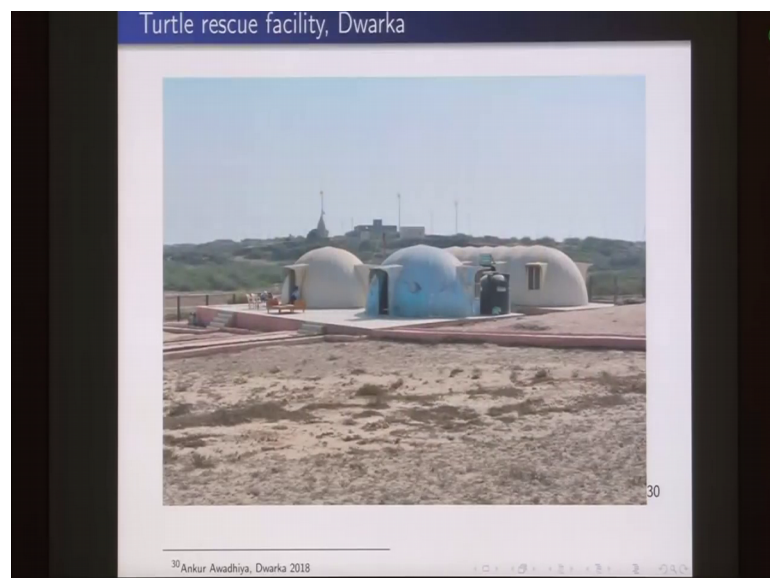
these birds have had large amount or large number of diseases such as tuberculosis, quite a number of these birds are blind or what do we do with this these bears? We cannot the just sleep them out in the forest. Because they cannot survive there so, we need to create another facility for them.

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Similarly, the facility for lions, now these were the lions that were rescued from different circuses. Again these lions have had quite a number of diseases including tuberculosis and you cannot release them out in the wild.

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Now, the things such as turtle rescue facility. So, this is one facility that is close to Dwarka and what the department is doing here.

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Is that in the case of beaches where turtles lay their eggs. So, there could be dogs that come there and eat up all the eggs and these days the population of the Peria dogs is the increasing. So, the department people go to the beaches, collect those eggs then bring them out into this enclosure that is surrounded by the nets.

And then these eggs are left to hatch, once they have hatched then they are taken in into these facilities in which we have large sized tanks. And in those tanks we rear these turtles to an age where they become self sufficient and then we release them out in the wild. These sorts of exceeding facilities also come in the definition of zoos as per the wildlife protection act.

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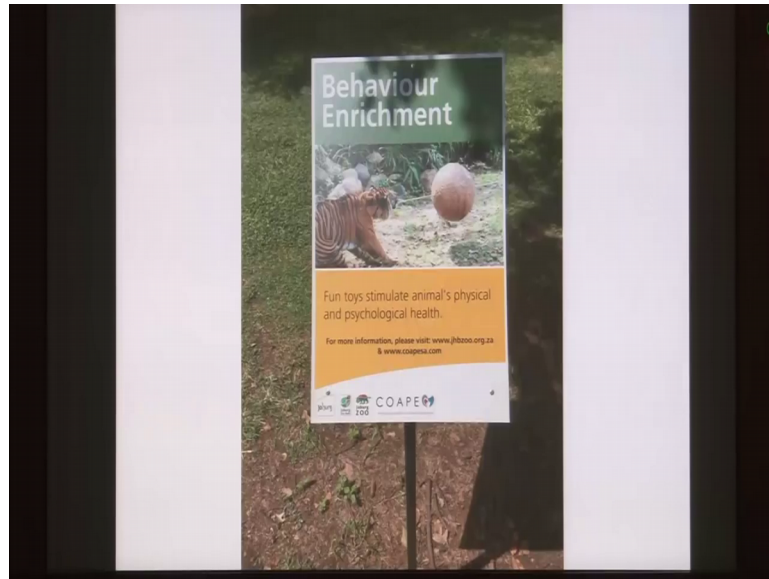


Now, one of the things so, these were the good things about the zoos, but then in number of zoos there are problems still which need to be tackled. So, let us have a look at this tiger, now what is this tiger doing? This tiger is in a very small sized enclosure. You have concrete floors everywhere and this tiger is just facing from right to left and left to right. Now, why is this tiger having this behavior? Now, the first thing is that this tiger is hardly anything else to do. If you look at this enclosure there is hardly any behavioral enrichment.

So, for instance if you are kept in a room and you do not have anything to do what would you do you do not have a book to read, you do not have a movie to watch, you do not have a toy to play with. So, this is the situation of this tiger. So, this tiger is feeling bored and this tiger is displaying the behavior that goes by the name of stereotypes. Now, stereotypes are behaviors that an animal depicts when this animal is under stress and when the animal is feeling extremely bored.

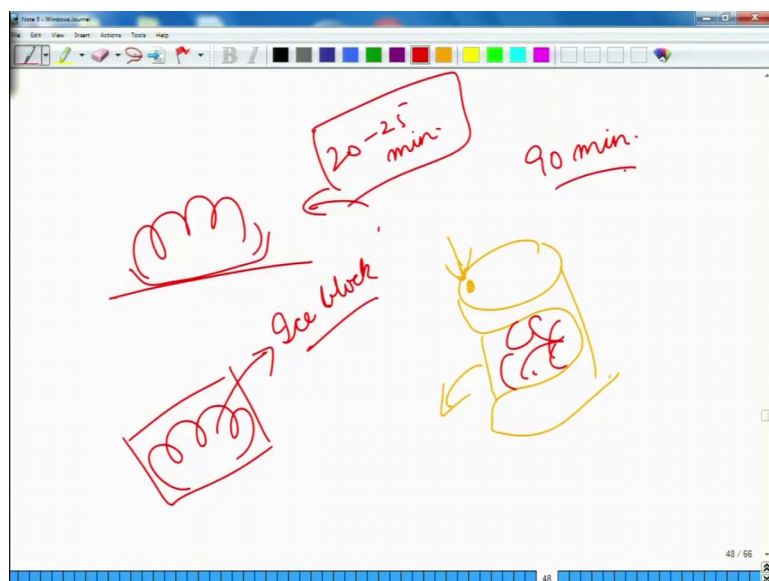
So, in this case this behavior would go on again and again and then later on if you are rearing these animals and later on if you try to release them out into the wild situations if you are trying to re introduce any of these animals they would show these stereotypic behaviors even in the wild. So, this would reduce the their fitness and the wild situations. So, these are things that need to be taken care off. In these days in the zoos we are given more and more taken to these things.

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So, what do we do to counted these behaviors such as stereotypes? We go for behavioral enrichment. Now, this is an image from the Jahanas bug zoo and what do these people do? So, here you have another tiger and this tiger is pulling against this block this fear of might. Now, why is this tiger doing this? Because, you are giving something for this tiger to do, this tiger also has 24 hours in a day and it can only feed for a number of hours not more. So, this tiger needs something to do. So, what are the points of behavioral enrichments that you can get to an animal?

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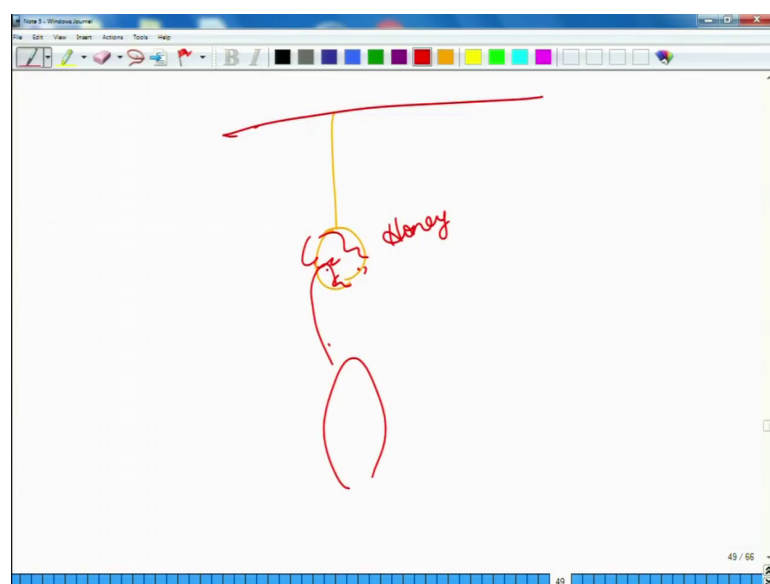


So, for instance in certain situations the animal was given food on a platter. So, here the animal has a feed, the animal comes here eats the feed and say it takes 20 to 25 minutes. And after eating this food it has got nothing else to do. So, how can you enrich this behavior? You can take say for instance a log of wood and in this log you create some holes. So, here you have a big hole and then you put your meat in side and then you cover this area. And may be you have say a small projection here which if praised with open this end.

So, now if you give your tiger meat in this format, the tiger would and this whole area has been scented with the meat smell. So, now, you are your tiger will go on playing with this log because, it knows that there is food somewhere inside, but it does not know how to get to that food. And then while playing if it traces this button, it will get this food out.

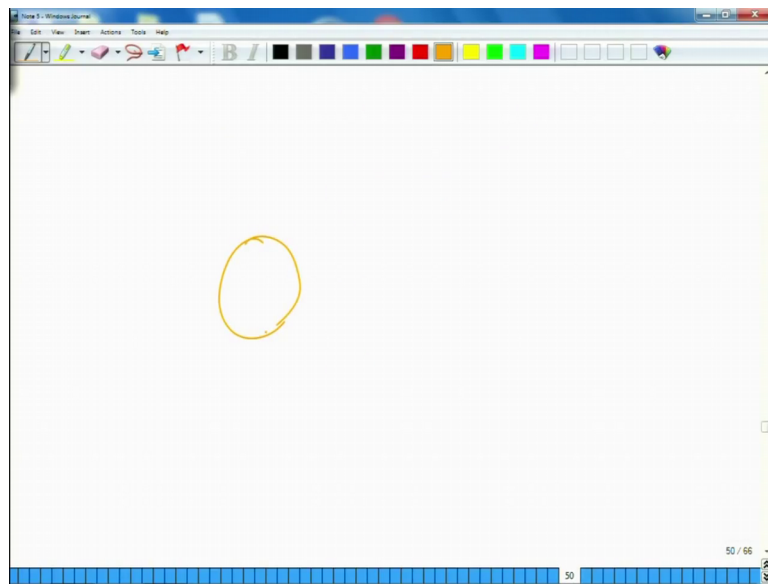
Another way in which an animal is given the behavioral enrichment is that when we have all of this meat it is say frozen. And so, you it becomes an ice block and then you have this ice block if you give it to the animal it would start licking on this ice. This is specially done in the in the extreme summer seasons. So, in this case the animal would be licking on this ice block. It would not get to the meat right away, but then eventually it will get to the meat. So, in case of taking 20 to 25 minutes it will take say 90 minutes or for instance in the case of bears.

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So, in the case of bears you can for instance hang a ball and this ball is made in with honey and this ball is kept at a height. So, if you have this bear here this bear would try to get to this ball, but if this one is right above it is height. So, it will only get a few chances of licking at the honey, but it will have to play with this ball again and again or for instance in the case of Finland zoo we observe that there was a tiger and this tiger was given a football.

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Now, what would a tiger do with a football? A football is a large sized ball. So, this tiger will not be able to gulp it and it will not choke on it. So, what does this tiger do? This tiger plays with this football for some time and then later on when one of it is nail pierces this football this football all the air comes out and this tiger feels very happy just like a small kid that is playing with the balloon.

So, things like these are known as behavioral enrichments. And similarly, in this picture what we are observing is that probably there is some food inside and this tiger is pulling on this sphere. So, that this thing should open and it should get it is feed. So, these kinds of things are known as behavioral enrichments. We typically go for those behavioral enrichments that are close to the nature. So, for instance things such as bamboo shoots should be used or things such as box will be used in some instances we also go for artificial behavioral enrichments in the form of tire tubes or in the form of football. But,

then when an animal gets these things to play with this animal remain excited, it does not feel bored and it does not show the stereotypes.

So, things like these are also becoming extremely important when we are talking about our ex-situ conservation facilities such as zoos. So, in this lecture we had a look at what zoos are, these are places where people can come and have a look at animals, but that is not all. These also includes circuses, these also include the rescue centers.

Then when coming to our additional zoos, display of animals is not the only thing that is needs to do. It needs to ensure that feed is coming in a proper manner, the feed is propped as cleaned at in the, this feed does not bring in any diseases, the feed is cooked properly, this feed is given to the animals at right times. The animals get all veterinary care that is required for them the we you have a facility for x rays, you have a facility for operating theatres we have you have facilities for (Refer time: 32:43) cages.

So, that you can take blood samples, you can give the animals some medicines. Then you need also need to ensure that all the people that are coming inside because these people are guests in the zoos because, one of their primary function is the display of animals. So, when people are coming you need to ensure tourism management. These peoples should be happy, these people should be contained. Then when these people are coming inside you need to ensure that their movement is proper. They are kept separate from the animals they are not able to poke their fingers inside one of the cages so, that the animal is able to bite it at their fingers.

Emergency situations need to be dealt with, the animals need to be kept in a manner that they are not able to come out. So, for instance in a number of situation we will have large size boats. So, boats will be large size drains that are filled with water so, the animal is not able to jump outside, but at the same time we also need to ensure that the animal is kept at a higher elevated position.

So, that this animal does not feel psychologically threatened, this animal should not feel bored. So, you will get give it behavioral enrichment. So, there are n number of activities that are going on just in a small facilities such as a zoo. So, the next time you go to your local zoo or a municipal zoo or a national zoo do keep in mind that you not just observe these animals, but you also observe what is going on in the background. So, that is all for today.

Thank you for your attention [FL].