agMOOCs
GIS in Sustainable Agriculture
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Welcome to agMOOC lectures.
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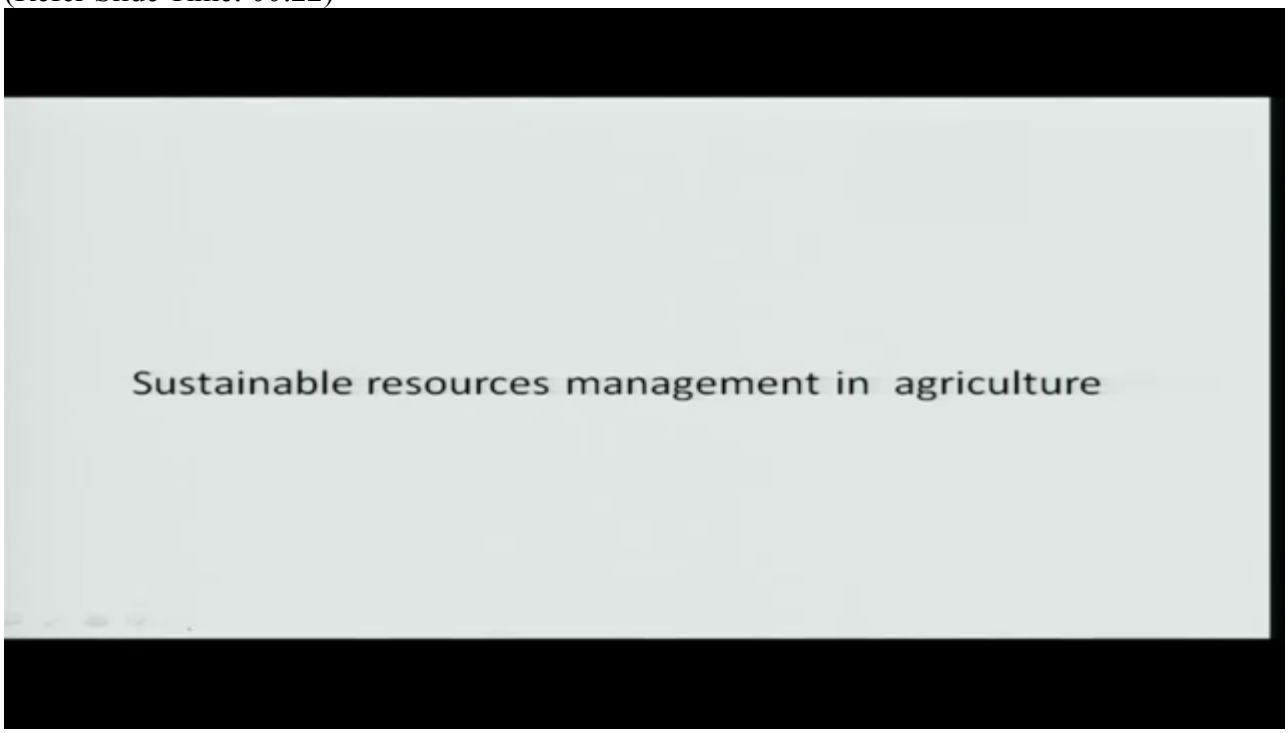

And in this lecture what we are will be doing is we will be talking about the sustainable resources management in agriculture and then what we are talking about in the way we have seen in the agriculture practices and the agriculture is a oldest profession or oldest activity which we have started. People started growing crops and then the water requirements are met meant from river, lakes and then convey it through the -- canals have been taken place. Okay. So that is one aspect.

The second aspect is as we started growing more and more areas are brought into agriculture. In that case that because of our excess use in growing the crop we have started using pesticides. We have started using some chemicals, fertilizers and things like that. And then the third is whether there is a time requirement between one crop area, one crop season to another crop season to third crop season, so that there is a recuperation of aeration takes place in the soil which has been not done.

And another thing is there are crops 15 months, 12 months crop like a cash crops because of the cash crop it is like you have invested more money in the crop and you have to get back that. If it doesn't happen then there are problems related to the social problems have started it. So now what has happened was now there is going to be another dimension to the agriculture is coming under the threat is about the climate change. And we are not talking -- we are not aware what type of change which we can handle it and how to prepare ourselves is our main issue.

In that case then what are the information content, whether it is documented, not documented, everything in the same so that we can compare and learn and then do a different way of practices. So what that was not available in the previous years. So now we have started documenting it in a digitally through this geographical information system or a geospatial information system where every the land portion is covered with the lat/lon and things like that whereas whatever the activities which you try to do it that is it all documented. Whether it has given as a good flip to grow and at some places what has gone wrong. It gives some sort of an evidence, some sort of a data for us to analyze what has gone wrong and what has gone right and what all the impacts after five years or ten years. These are all the things which we have learnt now.

Now what we are looking for is this agriculture need to be a sustainable one. That means that there should be a steady growth and steady output of crop lead is required to meet our populations in the near future. And at the same time, our resources like natural resources like a water and storage, all the facilities, those facilities are in a deteriorated conditions. Now how much we can spend and how much we can expect, how much we will be able to share our resources with other people, non-agriculture people is the question now. In that way what we are trying to do is we are trying to integrate all the parameters, all the spatial, temporal and local in the different levels, different levels in the sense either in the regional level, local level or in the farm level all this documentation is needed, that documentations can be created using the GIS applications. That is what we have talked about in the entire seven weeks period.

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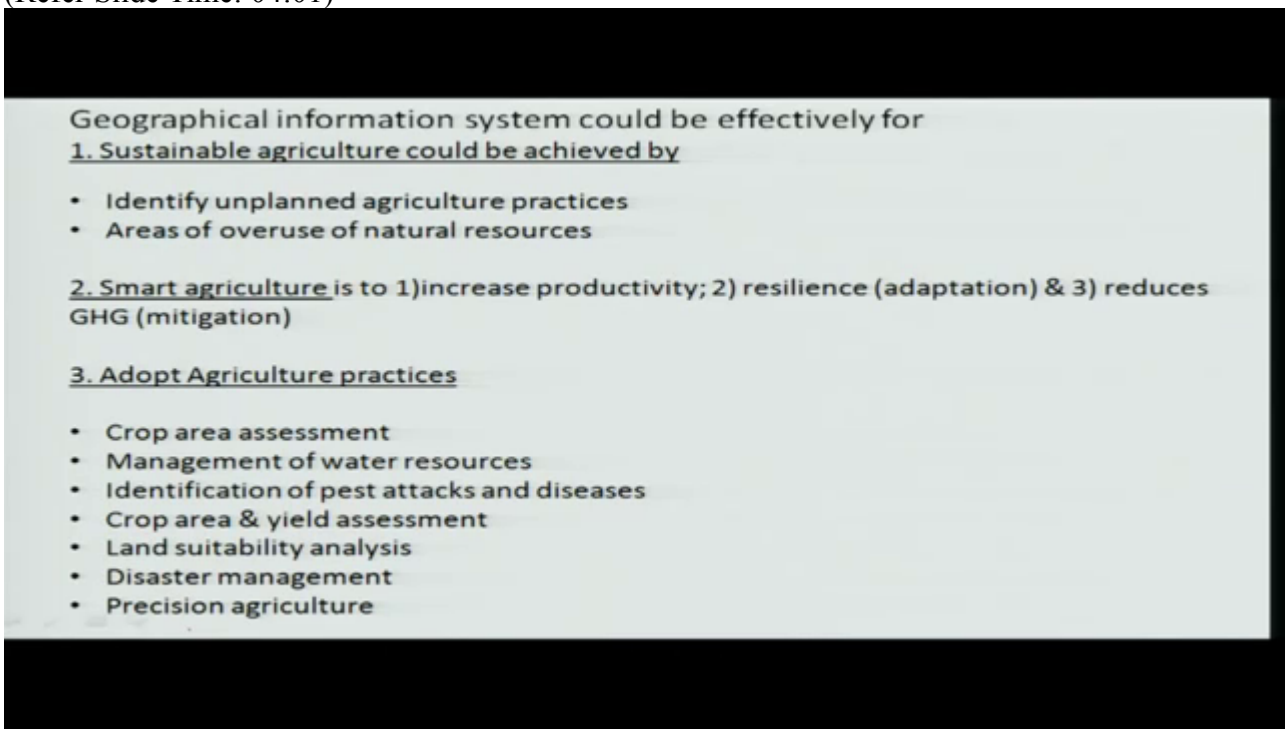

Now for what are the different requirements for the sustainable agriculture in the forthcoming thing is, you can sustainable achieved by identifying a unplanned agriculture practices in a particular area and overuse of natural resources. That means the over use and unplanned activities they may damage the system as well as the – it may drain out our natural. Okay. So

this needs to be identified, needs to be monitored and needs to be synchronized with the rest of the activities. That is what this sustainable agriculture may lead us to do that.

Another thing is this we are talking about the smart agriculture. Smart agriculture is -- smart is something like that use little input get the maximum output, that is what increased productivity is needed and I need to adopt things wherever is possible. So that -- what is reduction of GHG, that means greenhouse gas emissions so that then the global warming could be minimized or maybe control from the contributions of burning of fields from the agriculture sector.

Now the third aspect which we can do by this way is our crop area assessment is always done on a ground basis, but which takes time but now we have remote sensing satellites and other monitoring devices which will give you a good crop area, crop conditions and crop yield predictions. So there another resources which we can use, adopt in the agriculture practices, management of water resources depending upon the availability or unavailability and minimizing the water losses and then minimum losses, maximum production per drop of water.

Third thing is about identification of the pests and attacks and how it is, where it started and the how it is spread and how to kill the other way round, crop area assessment. Then major thing is when you want to go for the agriculture area expansion, land suitability is one among them. The land suitability analysis is based on the aerial extent, quality of the soil and suitability for the particular crop. The disaster management is related to drought or flooding or that kind of category. Whereas when it comes down to the precision agriculture where the crop yield predictions are very accurate, at the same time the monitoring cost or the measurement cost become little expensive and whether it is manageable or not that has to be seen on a larger period.
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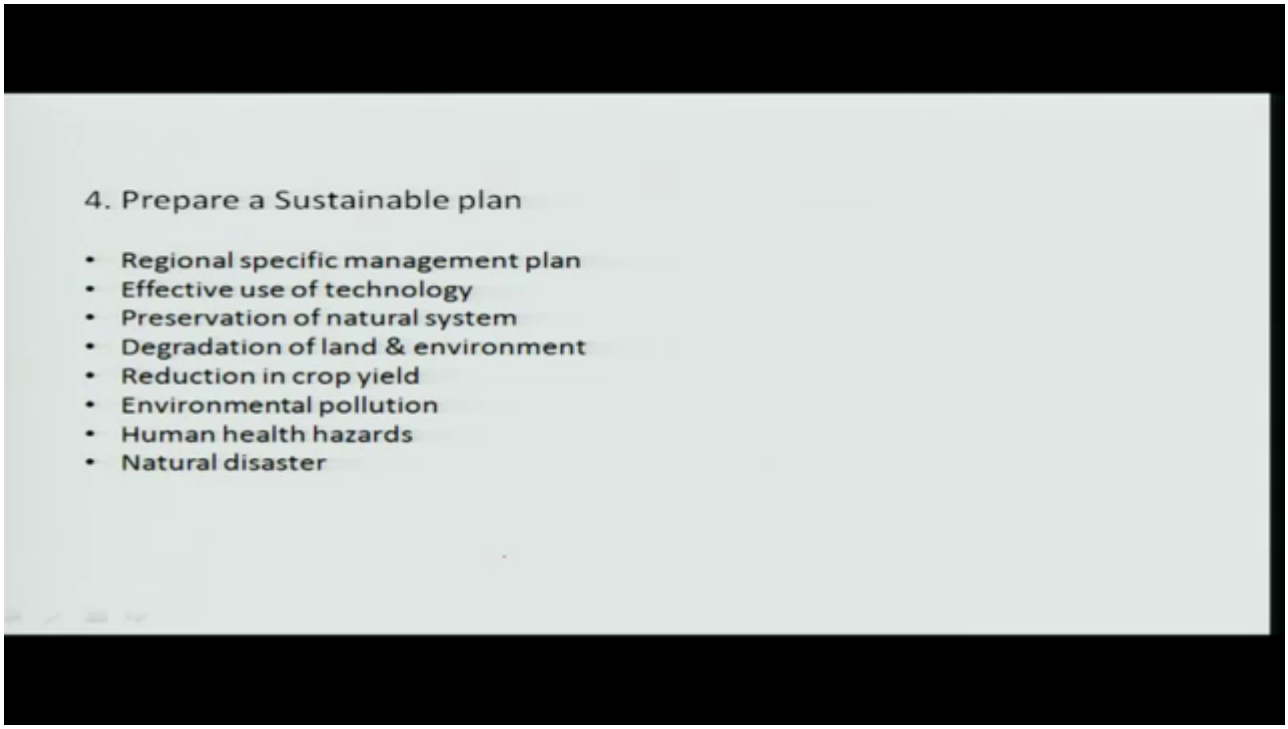

So, what is needed at this part of the time is there is a regional specific management plan that means identify this area needs to be done only with this type of crops and we are expecting it instead of variations within the region. The technology could be effectively used in assessing, giving or a farmer related information accurately. The identity of the system or identity of the region needs to be preserved.

Now there are degradation of land like what we said about in the soil salinity at the water logging and which leads to the environmental degradation which will prevent us to reuse the area for after a long time. Then another one is about the crop yield. See crop yield estimation is one thing and each are the areas which are having a lesser crop yield irrespective of the best efforts and finding a solution and doing a search on that is of prime importance when then growing more crops.

Environmental pollution; when there is a rain then there is a take a pesticides and fertilizers or carried away from larger distance and if it gets stored in a particular pond and then pond develop certain environmental degradation. So these are all the things which is happening because of the agriculture-related activity. Our groundwater gets nitrate and other issues -- other elements which gets (inaudible 00:08:38) and which makes the groundwater not drinkable in the near areas.

Health hazards as well as natural hazard, these are all the hazard which we have followed it and which we can identify and contain this hazard to a lesser extent by using the -- these natural hazards and the health hazards can be minimized by making it awareness and which induces, grow and then it damages. So these are all some of the areas which we have a suitable again sustainable agriculture management. And in this thing this – in this information system it can be in a different scales as we said is about the farm scale or it is a plot scale up to the regional scale and that means that scales which we talked about this one is to 1000

scale, as well as one is to 50,000 scale, so that resources especially the water resources which is available in the area can be accurately assessed and the demands can be met un-interrupt out the water supply can be given into the farm sector so that they will be able to grow and then give a sufficient crop yield to the country and making the food security important for this thing.

So this is what this course sums up with -- there are different water is taken as a primary one which is likely to be affected because of the climate change. How this temporal variations --another important factor in the sustainable -- preparing a sustainable plan is that we may have to have all these parameters in hand and we have to address these issues in the integrated manner not only in growth period sustaining it and then including the crop yield increase.

Now this is the way where in our game the near future is about measuring it, monitoring it and developing a different kind of adopting it different technologies in making the crop yield with a target of the crop yield, so that we will be able to provide enough security to the food for the forthcoming generation. Thank you.