agMOOCs

GIS in Ag-Essentials and Applications

Modified Agriculture Practice - Climate Smart Agriculture

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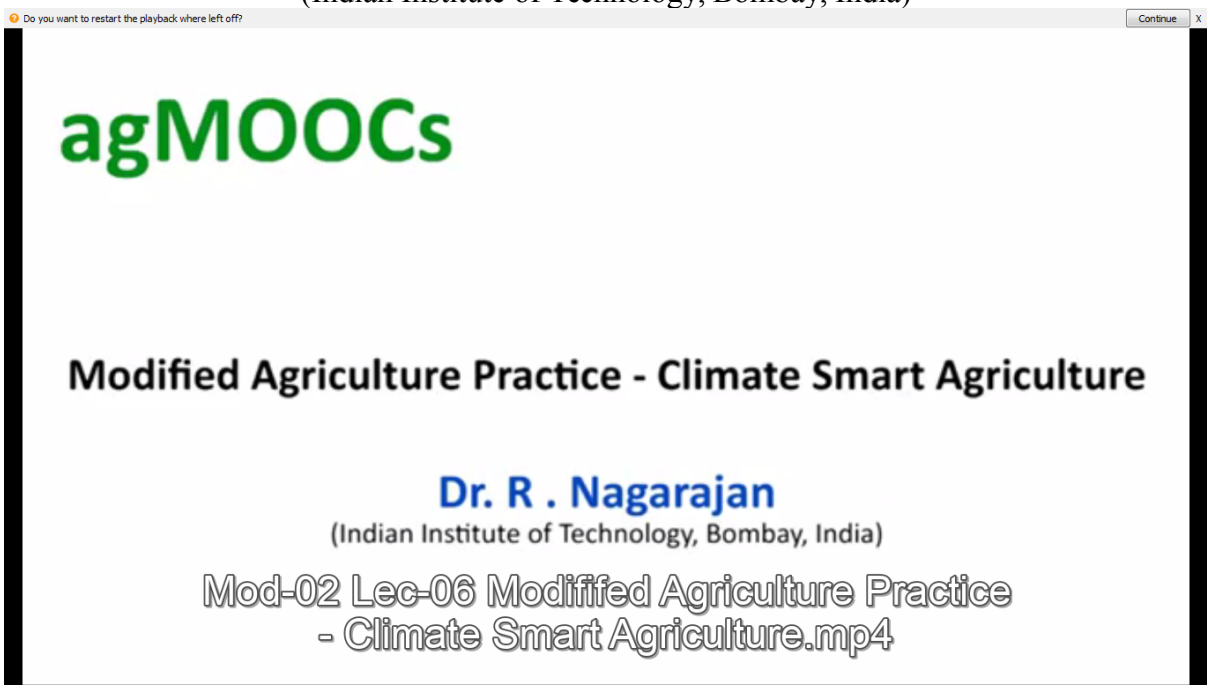

Welcome. Then we will be continuing with our course, and now we'll be going back. We have seen what are all the different agriculture practices which have been -- which people were following it for the past two so many years, and what are all the impacts. And if you have to do, what all the concerns about from the micro level that is from the farmer's level -- plant level, farmer level, village level and area level. Then what are all the new practices with the making use of the advanced technology in the term for precision agriculture purpose and what are all the issues which are related to the precision agriculture activities.

Now we will be just going back going another aspect, which we can try it out on a large scale activities for crop production, as well as towards food security.

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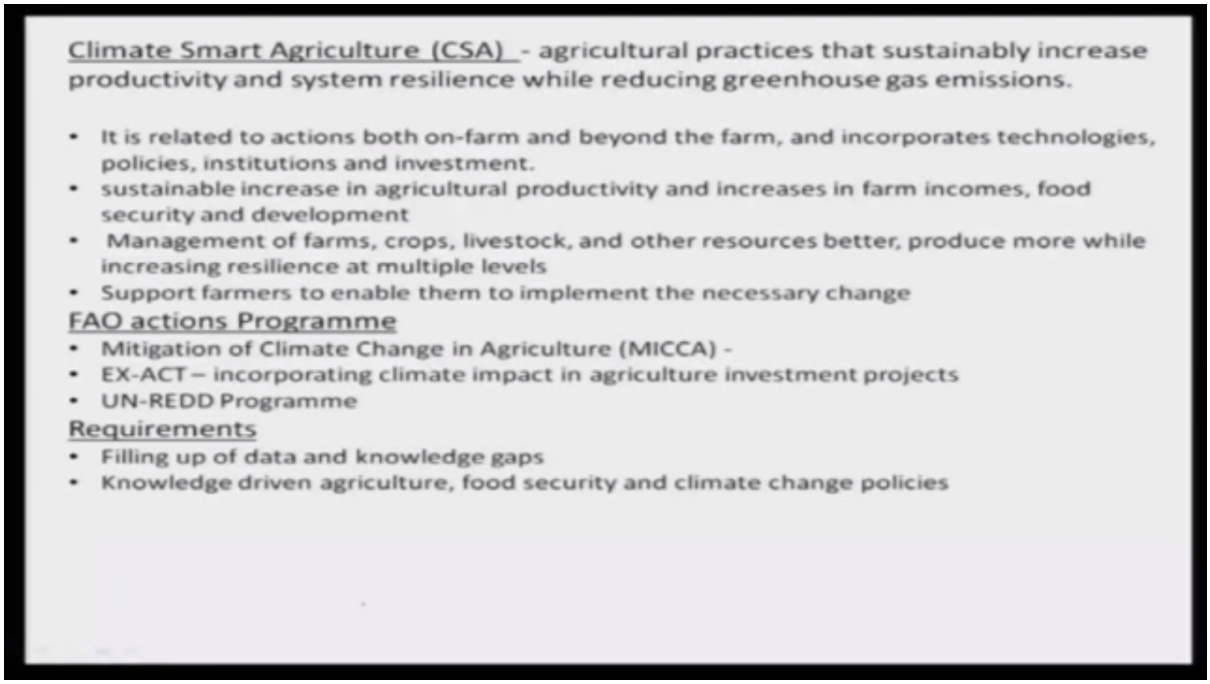

This is what we call it as a climate start -- Climate Smart Agriculture. What does it mean by Climate Smart Agriculture is same -- follow the same agriculture practices that can sustainably increase the productivity and by reducing and by complying to the climate related impacts like reduce water, then reduce the greenhouse emissions, which causes the climate change and also usage of fertilizers. That means you get the agriculture practices need to get adopted to the forthcoming climate change impacts. That is what is Climate Smart Agriculture means.

So what does it -- what are all the different constituents of that particular climate smart agriculture? That is the actions on the farm level as well as beyond the farm levels. Then incorporate technologies. Now what -- and also policies, institutional and investment availability or non availability. Now what happen is the farms, yes, fine. How the farms will be affected by nature? How the farm producers will be able to sell it out in the market? What are all the different institutional and investment methods which are available for growing these crops?

So all these practices, all these things, they have to be put integrated and look at it agriculture as a holistic approach rather than piecemeal approach, I am a farmer, I can do only this much, and I am a person which is a groundwater or pesticide supplier, I can do this much. So instead of leaving away all the things, our goal need to be a food security for the future purposes and minimizing the damages, crop damages and getting high field, high crop field conditions. That is what is the goal of this climate smart agriculture.

Now if we do the sustainable agriculture, what happens is one thing is for the other human race, the agricultural productivity increases. The food security is assured. For the farmers, his income goes on increasing whereas towards the food security managers, there is a some type of positive note and they can relax a bit for that particular area.

Now another aspect of that management includes managing the farms, managing the crops, managing the livestocks and other resources better or with knowingly what type of after learning this type of courses, agMOOC courses, which tells about different ways how to

manage your resources, produce more, and increase the resilience and also at a multilevel, multilevel in the sense farm level, village level, then regional levels.

Now see I am interested -- these are all the things which is ideally need to be done. But at the same time, farmers, they may not be able to implement necessary changes. For that what is needed is some amount of institutional and investment as well as policies need to be slightly modified or totally modified wherever it is needed. So this is the another kind of agriculture, another way of or another concept of food security in the -- with reference to climate change in the future.

Now what are all the different programs this has been in the consumption stage or to some extent it has been happening?

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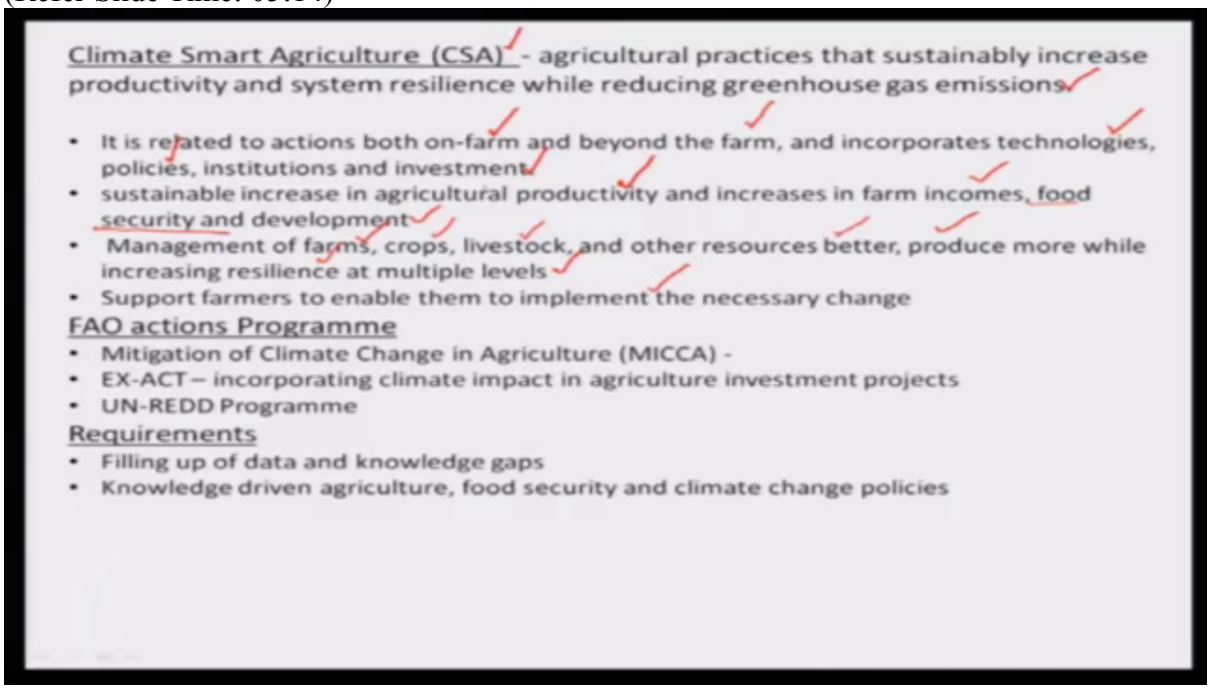

So there are FAO action programs are there. Mitigation of climate change in agriculture incorporating all those areas. Then there are EX-ACT, that is agriculture investment projects. There is a small policy changes investment methodology changes, as well as there is a UN-REDD programs, which focus on the climate smart agriculture, what are all the problems, how do we come out in terms of technology, in terms of policies, in terms of institutional investments.

Now what is needed for us as a farmer, what I am supposed to do that? So you may have to identify what are all the gaps? What are the filling up of data which is missing? What type of knowledge which is missing with me, like maybe in understanding the policies and executing it at your level? That is what I mean by that knowledge gaps. Then it is the agriculture is driven by knowledge, not only your knowledge, and the knowledge, and the experience, which is gained by other people so that climate change policies also can be incorporated in this type of activities. That is what the climate smart agriculture, which has been proposed.

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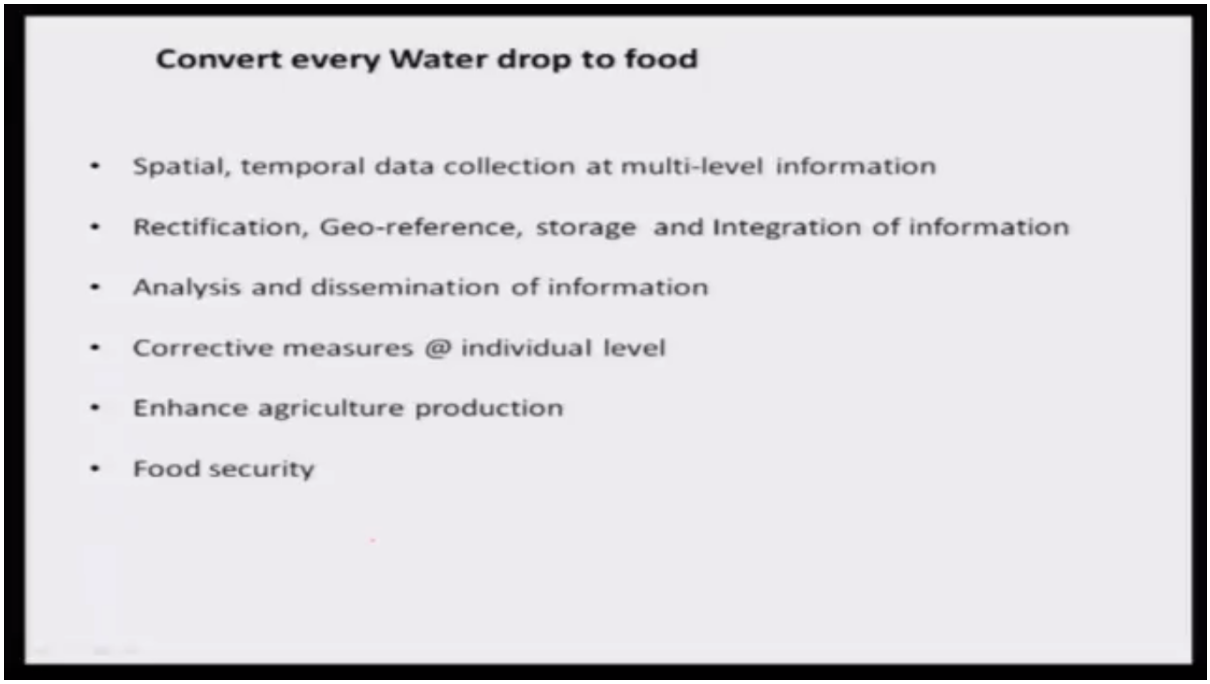

The main aim of the entire thing in the previous areas convert every drop of water to food. That means the wastages of water needs to be curtailed. Every drop you added, there should be a growth related to growth. Otherwise, some of the flooding irrigation types, there is the return flow from the agriculture areas is estimated to be about 20 to 30% of the quantity of water which you give it to them. That we wanted to use it for other people.

So what is -- how do we do it or how do you go about it is the multi-level information should be there. Multi-level in the sense you have the plot, agriculture plot, villages, then area, then region, then the country of that kind of category with a different spatial accuracies maybe 1 meter, 10 meters, 100 meters of that type of data collection. Temporal is nothing but how frequently you try to do that. Daily? Weekly? Monthly? Or a seasonal wise? So that should be done on in different geographical locations so that the water can be saved.

Now what do we do with this type of multi-level information is the observations are carried out by different people with different information, and they are not to be uniform. They may not be in a same scale. Depending upon their convenience and the problems which they come out, they have a different type of scale factor. So those scale factors need to be rectified. There should be a common scale of merging all the datasets by geo-referencing. Then it should be stored in a computer system so that the input, storage, modifications, vigil or output are using it in a different decision making information they could be make use of by way of integration of information. This helps us in analyzing the data, not only today's data, this year's data, or even the data which is collected 10 years back, they may be able to integrate it and analyze. That information can be disseminated to all the people either in the form of an advisory or in the form of a (inaudible 09:20).

So it is not only a regional or area wise. It will be at an individual level also. Individual level means see we have all -- we have our own mannerisms. We have our own ways of producing the results. So some of them, many of them give -- many of them are or some of them are at least minimum one of them can be corrected or maybe changed or something else need be done depending upon the availability of that things.

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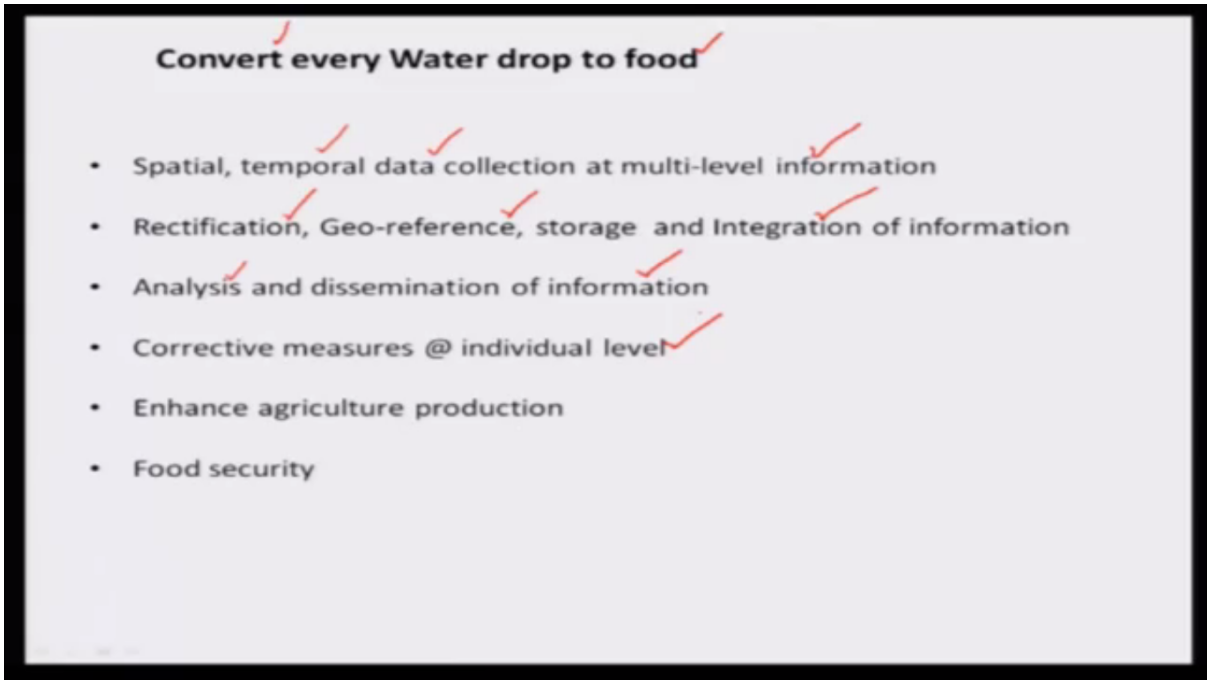

What do you do when you compare, integrate and then start adopting to the new technology, new methods of working? What will happen is your goal is agriculture production is likely to be increased. When you increase the agriculture production, the food security of the country, food security of the area, food security of the individual families, food security for the family in terms of food availability for them as well as money availability for their own activities, they will all will get improved. The wastages will be reduced. Redundancy will be removed from the system.

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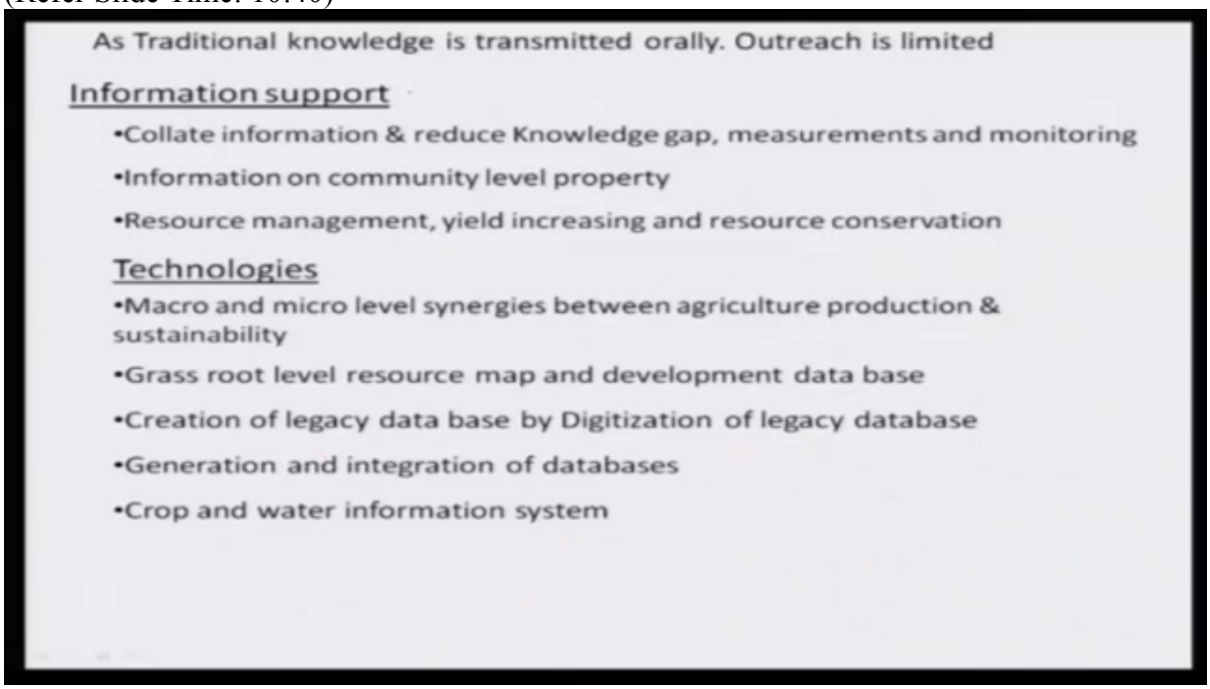

So what is needed information support is what we need to do is collate information. Collate information is nowadays after the digital world, previously getting an information is very, very difficult. We are not sure where that information is available. now the first job is identify the information requirement for the agriculture related activities. Collate them. Collate in the

sense you collect it from a different sources. Then so that that knowledge gap I do not know and I do not know where it is available, I do not know how to apply, this type of knowledge gap will be reduced in terms of -- and many of them what happen is the oral methods is no longer going to help us in proceeding further. It should be measured. It should be monitored and it should be analyzed.

So another thing is on the community many of our descents in agriculture is the community level property related issues. The reason is the property information is not widely seen by others or it is not widely standardized by people. So it is there in their own way and there is no standardization and as if you have written down in a piece of paper some 20, 30 years back, the condition of the paper will be in a different mode. The maintenance of that type of record maintaining is one among the major issues in the community level property related issues.

Then is about the resources management. This is the natural resources, human resources. Human resources what happened is natural resources, they are there, and they have reduced or they have not increased of that kind of category whereas the human resources is might be measured by the knowledge base in the agriculture practices. That need to be updated at a regular interval to increase the yield as well as in conservation of the resources.

Now conservation is one thing which is very good if it is practiced at the immediately. Now what all the different technologies are available for us to do this type of job? Now macro level as well as the micro level synergies, they need to be understood. There should be a pyramid. All the villages and village practices at the bottom, decision-making should be at the top of the pyramid. So that type of synergy has to come from for the agriculture production. It is not only crop, crop development, crop related factors, but also other peripheral factors or important factors like water, fertilizer, pesticides, machinery, human -- trained human -- human resources, all those things comes into pictures.

Now, in this case, what is happening is the grass root level resources, especially in the terms of human resources, that needs to be improved. Their skills need to be improved. So that is a skill development is needed. The developed is -- skill development is one thing. Everybody knows okay, I get trained up. So as a man, as a person who wants to manage or who wants to do a climate smart agriculture, he needs to know how many trained people are there and where they are there, how they are employed, can we use it for some other areas also so that same practices can be replicated elsewhere. For that purpose there is a need for a development of skilled developed people database.

Now see this is another digitization of a legacy database is related to the land parcels which are there in the villages which is coming up in the land records are not -- not maintained, not -- they are not able to maintain it properly because of so many problems. So that has to be come out. So it should not come in the way of development.

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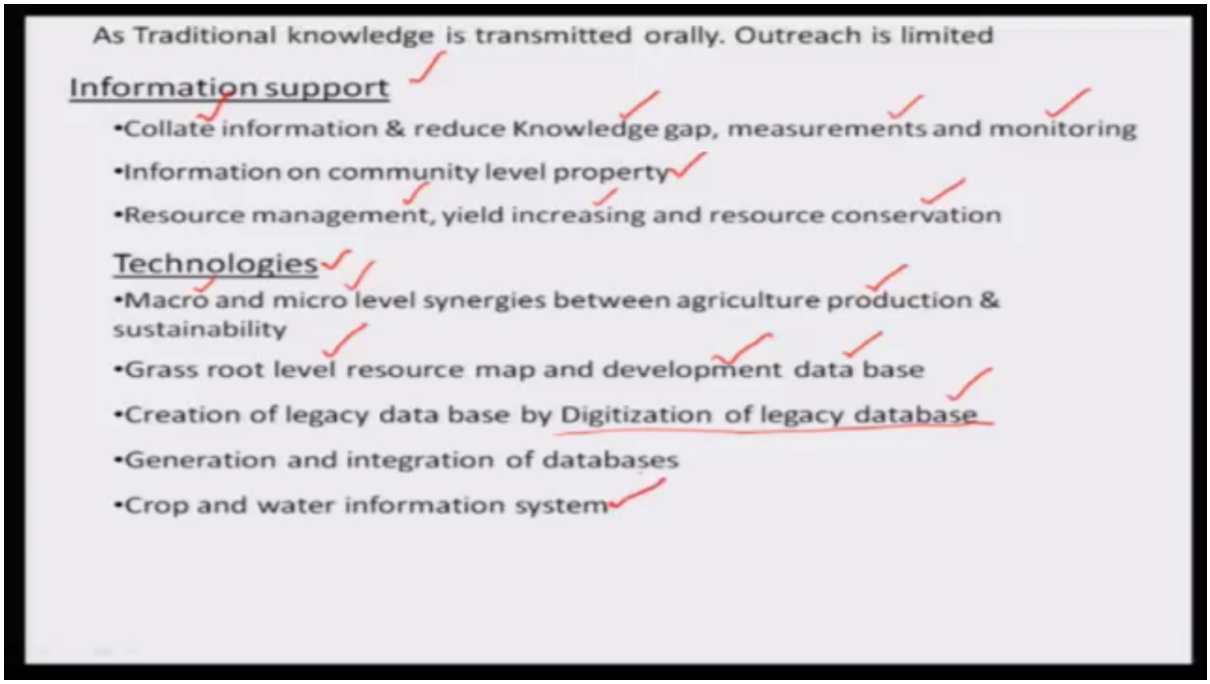

Then the last and the least is the crop water information system, which needs to be updated at every time so that it will be available to all the people so that it will be able to get a better information driven activities.

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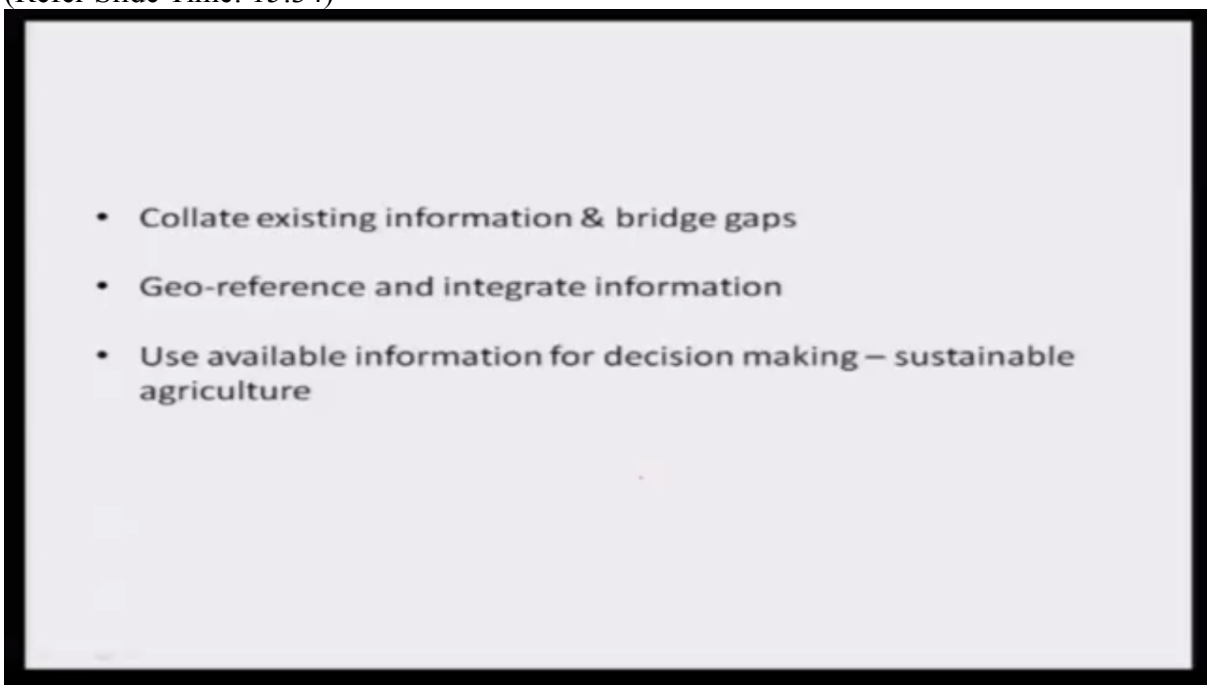

Now, so this is the need for the hour. How do we need it? What we were all talking about is we were talking about the collation of information, and bridging the gap between one para -- one activity to another activity. Then geo-referencing it. Nowadays geo-referencing is the only way of addressing a particular information because what we have seen the physical identification are a reference numbers in terms of stones which separated one field from the other. They are all removed or they are all taken away. So identification of this type of information is very difficult. So we may have to go back to the geo-referencing that is

nothing but lat lon identification, which you get it on even at your mobile and integrate those information.

Now the decision-making, what is a decision making in this agriculture practice is to grow for a -- first major decision is to go for a cultivation of that particular area or a field to go or not to go. If we go, then what are all the issues? Whether sufficient amount of water, good seeds, fertilizers if it is available, that is the major issue. In case water becomes the major issue, then do I have a alternative source? Alternative source in the sense do I have a supplementary irrigation source wherein I can do that. When you don't have a supplemental irrigation source, then your dependability or success rate is slightly on a lesser side. So that is how the sustainable agriculture could be done.

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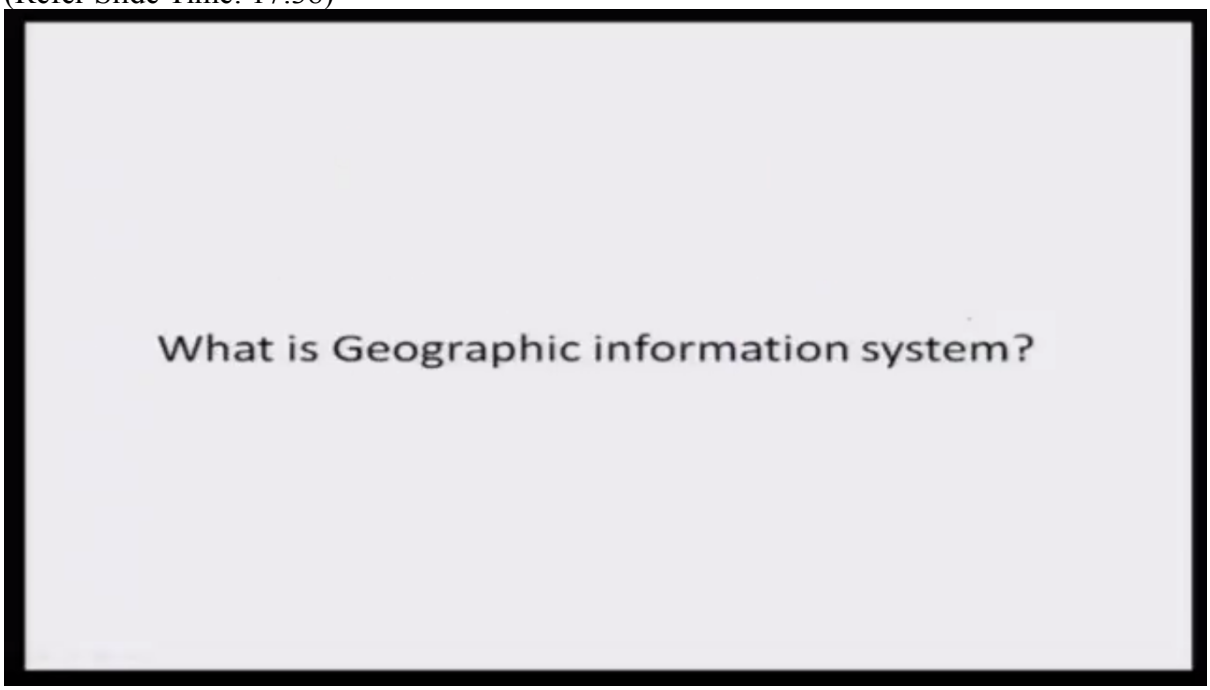

This is what in the first lecture which we would like to sum up is these are all the requirements -- requirements can be done. Then we were talking about what is the geographical information. Geographical information. What is it? So we will be able to talk about geographic information is nothing but geography. Geography is related to the lat lon of that particular portion of the Earth's surface. Information is the attributable which is described that and the entire computer system which manages that is what the system is, so which we will be able to see it in the next class. Okay. Next lecture. Thank you.