Needs and Weather Forecast
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Welcome to the agMOOCs course on GIS. It's essential and applications in agriculture. In the previous weeks what we have seen is what all the traditional methods which we use in the knowledge of computation or in the knowledge of how we present in the agriculture for our day-to-day activities. The next week we saw about what is the geographical information system and what it needed; why it is needed for the agriculture practices then we were talking about the different village information systems. Then how the village wise 7/12 are the farmland information is available and how it is handled and how best it could be handled in the geographical information system for an easy retrieval then easy update as well as for the transport of information.

Okay, now in the agriculture what we need is; we are interested in water. Water is the main source of water is the rainfall; the rainfall it comes from the clouds. So there is a need to understand whether the clouds whatever you see over your head in the horizon; whether it has got a potential to rain or not to rain so that my supplement irrigation from the wells from the any other sources can be made use of it. For that purpose only this week's course is designed for the weather cloud reading; how do we read the clouds and how do we, how do we estimate our asses ourselves whether there is going to be a supplement irrigation or not and also how the rainfall analysis is used in the irrigation schedule in the rain fed conditions in a larger way.

Now let us go to the; now the first one which we need to understand is what are all the needs and what are all the existing forecasts which people are able to give and we are all talking about forecast, forecasts and so many things how the forecasts are. Now why the forecast is more important for the agriculture people. So that the crop yield is assured. Now when you look at the deviation of rainfall and the impact on the yield which we say there are five groups during a crop growth activities; one is the pre-serving activities then the second one is the seedling activities, third one is the vegetation activities, fourth one is the reproductive stage and the fifth one is the maturity of the crops and as the crop. Once you have decided to go for a cropping and these stages how to be fruitful at the end of the day.

So that your crop field is assured now when you look at the amount of water which is required by the seeds by the plants, it varies it is from 40 to 60 millimeter the pre-serving stage to it is 50 to 70 centimeters in the seedling stage. As the plant grows the water requirement is twice that amount what it was there in the pre-seedling conditions as well as the reproductive is nothing but flowering and the fruit filling activities that is where it is around 180 to 200 millimeters. In the matured activities the amount of water is required is very less so this is theamount of water which is needed by the crops so that your crop yield will be fruitful crop yield will be on a higher studies or higher ways. Suppose if there is going to be a change in our deficit of water availability in these five different stages then the crop yield is not going to be the same as what you are expecting that is why for this purpose what we normally do is the rain fed-agriculture areas we try to analyze the range which are the

areas which are the periods wherein i should have enough supplementary irrigation from the wells, from the groundwater or from any other sources.

For this purpose this lecture is oriented. Now there are different varieties of weather forecast which has come up in a big way. If you look at it you have it what do they give; they talk about rain whether it is going to rain or not if the rain is there what type of rain whether it is going to be a drizzle or it is going to be a downpour. If it is going to be a drizzle forecast then it is ok for the crops; if it is going to be a downpour at times the crop may get perished off and also then the big this rain is based on the cloud pattern which is available on the horizon whether this cloud whether it is a cloudy or whether it is overcast or whether it is a clear suppose if it is going to be a war cast the rainfall is going to be assured one whether if it is going to be a clear sky then there is no cloud available in the horizon then the rainfall probability is very less so we are going to talk about this aspect how do we identify the different type of clouds and how to identify what is the probability on your own experience weather will it rain are not to rain in the area of your interest now another one is we do get temperature information from the different type of forecast which is available so this is also an important factor in terms of evapotranspiration and water requirements.

So this is also which we will not be able to talk over here but definitely this is one among the features which we are interested then partly cloudy what do you understand by partly cloudy is the symbol which it shows is there will be a sunshine and there will be a cloud pattern. So when you see this type of situation what type of cloud it is whether the probability of rain you yourself will be able to ascertain by the once you're through with this activity why we are interested in this type of thing is because India is a monsoon rainfall-dependent country and we need to understand how much is the monsoon rainfall is available for the crop growth and how much is the supplementary irrigation which is needed for that so when you look at it some of the areas which areas which are here drier areas and we have assured rainfall of 200 millimeters as well as the medium and other rainfall areas are given over here.

So, if any part of the country if you are here so what happened is there is the rainfall is not much then you may have to go for different kind of water requirement. Now this picture it will show you about what is the rainfall; the rainfall monsoon rainfall there are different kinds of rainfalls which we are witch we are getting it in general one thing is a conventional rain. This conventional rain is nothing but in hot areas in Rajasthan and Gujarat there is a; because of the high temperature the air gets heated up and then cools down and then it gives the rainfall in the localized area that is one type of rainfall which is there; another type of rainfall is the cyclonic rainfall. The cyclonic rainfall happens when there is a pressure difference in the ocean areas and all then there will be a lot of cloud formation in the ocean and it moves on to the land portion and that gives the rainfall that type of rainfall is the cyclonic rainfall are a frontal rainfall but here it is year-wise based but it is not consistent and that is why this rainfall is little tricky for agriculture activities the another rainfall is about the orographic rainfall which happens only along the hilly areas and which help because of the orographic conditions this rainfall take place the.

The most predominant one which in India is the monsoon rainfall; what is the monsoon rainfall? Monsoon rainfall is nothing but it is a group of clouds and which forms over this ocean and then it moves towards the land mass that is the Indian land mass and it rains that is what this is the seasonal wind which brings in the rainfall.

So that is why we do get rainfall from June to August or September at a regular interval maybe consistently this is happening nowadays there is some amount of disturbances in this type of monsoon rainfall. So we may have to understand this monsoon pattern very well before we go for any agriculture production planning purposes. Now another one is what do you see here is what is the Southwest advance of southwest monsoon? It is nothing but when this monsoon has reached the Indian and surround area and how it started moving towards the Indian subcontinent. So there is always a delay from one year to another year. So that means if you are planning calendar-wise, the sewing is either prepone or it can be postponed also. If prepone and postponement because of this advancement of monsoon; there could be certain implication on the crop. So we need to understand if you are any part of the country you need to understand what is the normal date of monsoon rainfall comes on to that site and how it is distributed over the entire area that needs to be understood for that purpose these two pictures are given it to how it varies between one year to another year. Now that is nationwide monsoon advancement as well as monsoon a retreat that is what we call.

Suppose in a particular rain gauge area then there will be a variations between the same day also that this is this varies. So this is this will tell you about what is the first monsoon rainfall date in a different places in Maharashtra, Akkalkot, Barshe, Souljapoor, Sholapoor and other places. When you look at it from 99 onwards this data is available for all the things it has started from 12$^{th}$ 17$^{th}$ June. In someplace it is 12$^{th}$ June. Some places it is in 21$^{st}$ May itself so this type of first rainfall if it varies between place to place then assessment of water is going to be difficult and the assessment of the crop planning is going to be a trouble for us. So, when you look at it here in one place it is 4$^{th}$ June in the another place it is 31$^{st}$ May itself so this type of variation between adjoining areas this is likely to give some sort of a giddiness for us when the farmers have to start the seeding activities.

Now this is about the rainfall, rainfall practices which is there but what are the different kinds of weather forecast which is given by the Indian meteorological edge Department and other agencies are one thing is a short range forecast that is for 24 to 48 hours. This is for an area this is for the region, not for the particular village, not for a particular plot that which we need tounderstand. Then second thing is information content what they get is, what we need to do is the cloudiness probability of a rainfall and intensity and the range of high and low temperatures are given over there whereas in the medium range forecast it is for three to ten days for a planning of agriculture operations right? What is the then the long range forecast is for 11 days to a seasonal forecast which normally they try to give it up. Now and how it is; there is that we there are variations between the forecast and the actuals in a region as well as in smaller village level also in that is why we need to have, we need to study the cloud pattern over the village or over the horizon from your place is more important.

Now then for the operation uses there are different methods which they do is there is a power regression methods which are being used these are all the probability models also they try to use it up and it's in the model accuracy varies from place to place which you may have to keep it in mind. So given a condition, formation of a cloud is more important. What is a cloud day? Will it be a cloud day for tomorrow; so how do you assess; if it is there in the adjoining areas then only you will be able to get a cloud in your place then second thing is what is the probability of a rainfall whether to go for a pumping or not pumping is another activity then second one is about what type of clouds we are going to get it tomorrow whether the clouds are likely to have a rainfall or low rainfall is another information which is needed; the third thing for an agriculture is. Is it going to; in this rain if it falls; is it going to be sufficient. So that thus the root zone of the crops is going to be saturated or not and if it is not there whether to start my pumps as for the supplement irrigation or not these are all the questions which comes out from the farmers. So we will just see about the clouds and cloud probabilities in our next lecture. Thank you.