agMOOCs

Development of selected weather window for issuing agro advisory – case study from Tamil Nadu

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Dear students. I welcome to this today's class. In the last class we had a discussion on role of climate managers. Since their role is to disseminate the developed agro advisory to the farmers at the village level. That is for mass communication. In the last weeks we have learned the weather forecast and how to prepare the agro advisories. That type of exercise is being done through human intervention. People, scientist who work at weather forecasting center, the develop forecast through computer and communicate to the regional meteorological center. Then it comes to the agromet field units, those people are examining their forecast and they prefer the agro advisory based on the crop weather interaction, information received from the district officials, indigenous knowledge, thump rules and they communicate to the farmers through SMS. This is to be happened. The present stage also like that.

But today we take you to something a wonderful way of a future activity. This has been tried, a prototype has been tried in Tamil Nadu how to prepare agro advisory along with preparation of the forecast for five days and sent to the farmers on direct mode, no human intervention is required. These will be discussed in today's class. Before that we have to do some exercise. That exercise means we have to learn something on selected weather window, this is highly useful for the preparation of agro advisory on computer mode.

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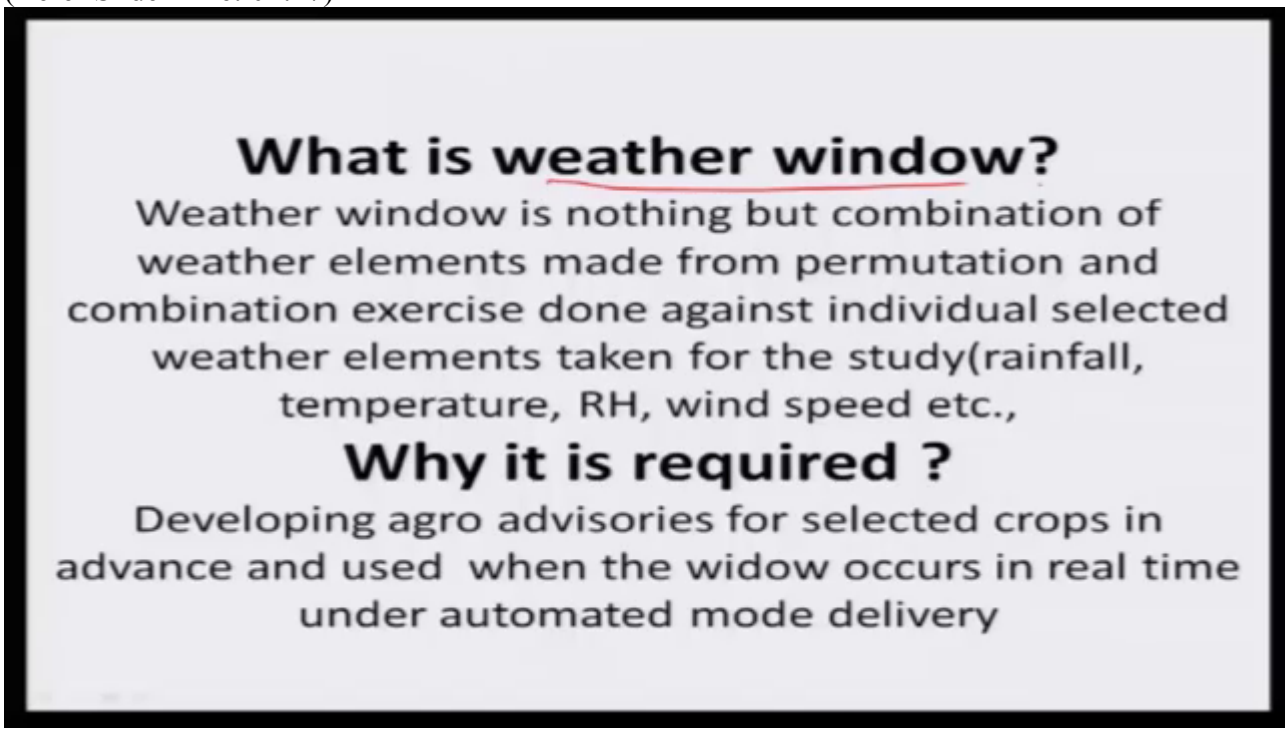

Now you may ask what is weather window? The weather window is it defined here is nothing but combination of weather elements with threshold level. If you take rainfall 0 or 15 millimetre or 40 millimetres some threshold level from permutation and combination exercise done against individual selected weather elements that we'll be seeing. For example, we like to select weather elements for developing or generating weather windows that weather

elements must have higher impact on crop production or must have a higher risk with the crop production, for example, rainfall. If rain is there, there is no problem. If rain does not occur there is a problem. Likewise in the maximum temperature, minimum temperature, cloud cover, mean relative humidity and also wind speed or consider for selecting the weather window. But in Tamil Nadu case study something different that we'll be discussing at later.

Now, why it is required? Why this weather window is required? So developing agro advisories in advance for selected crops, normally in the case of the human intervention earlier classes after the receptor for your forecast you prepare agro advisories. Here when weather window is prepared already and also you will be preparing agro advisory in advance and you put it in computer. So these weather windows provide an opportunity to prepare our agro advisory in advance so that people can adopt in most way, in most adoption is highly possible through this way.

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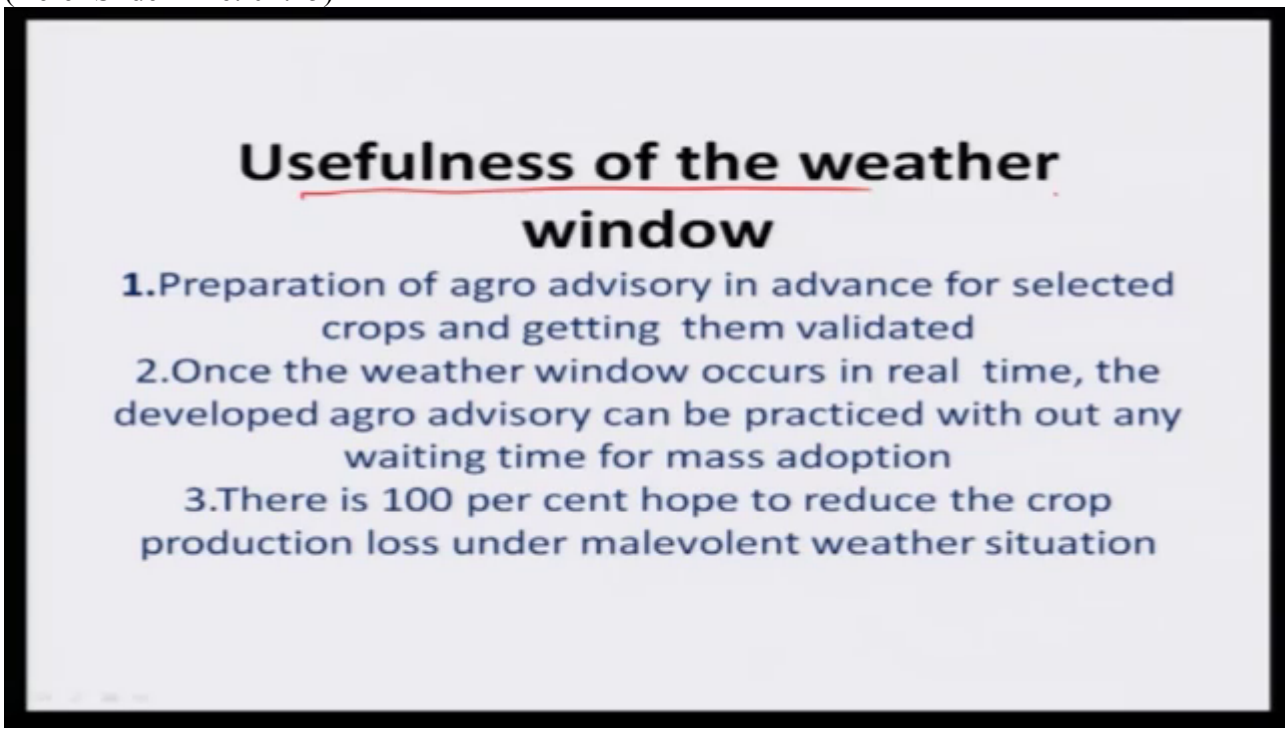

Now coming to the usefulness of the weather window, so preparation of agro advisory in advance as I told earlier, once the weather window occurs in reality you have already stock of agro advisory that will be picked up by the computer and communicate to the farmers with no time loss, immediately. But in the case of our man-made agro advisories minimum it takes a two to three hours to prepare the agro advisory. Everything is prepared. This is like a cooked meal you can eat very well, need not wait for cooking.

So waiting time is not available. There is 100% hope to reduce the crop production risk under this malevolent weather situation. Malevolent means it's a bad weather situation. So, how it was developed of Tamil Nadu? This is very very important. See, we have to prepare a set off weather elements under single weather window system.

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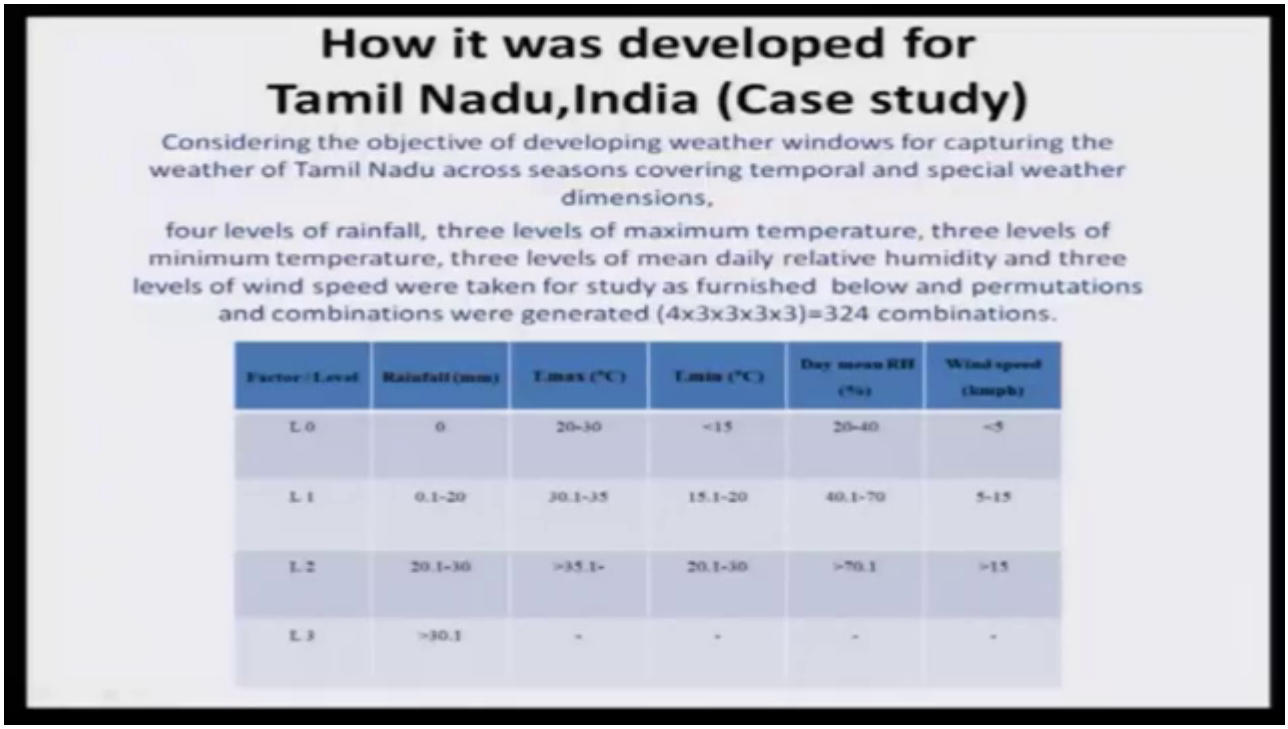

Now in the case of the Tamil Nadu Agricultural University, we have taken rainfall as one among the weather elements to be considered the important on developing crop production risk, maximum temperature, minimum temperature, mean RH, that is morning RH and evening RH will be added divided by two mean RH and wind speed. This or this selected weather elements considering their importance in Tamil Nadu crop production.

Then next step is I have selected one, two, three, four levels of rainfall. This is the amount of rainfall that is being received in the Tamil Nadu across the seasons or across the whole of the year. So one level is zero millimetre, this is a dry level. Then 0.1 to 20 mm, then 20.1 to 30 mm and greater than 30.1 mm. likewise there is a three levels of maximum temperature selected. Three levels of minimum temperature selected and three levels of mean RH is selected then wind speed also three levels.

If you multiply these four rainfall, three temperature, three minimum temperature, three RH, three your wind speed, you get 324 combination; permutation and combination. That I have given. So this permutation combination we get by involving all those selected weather elements we get 324.

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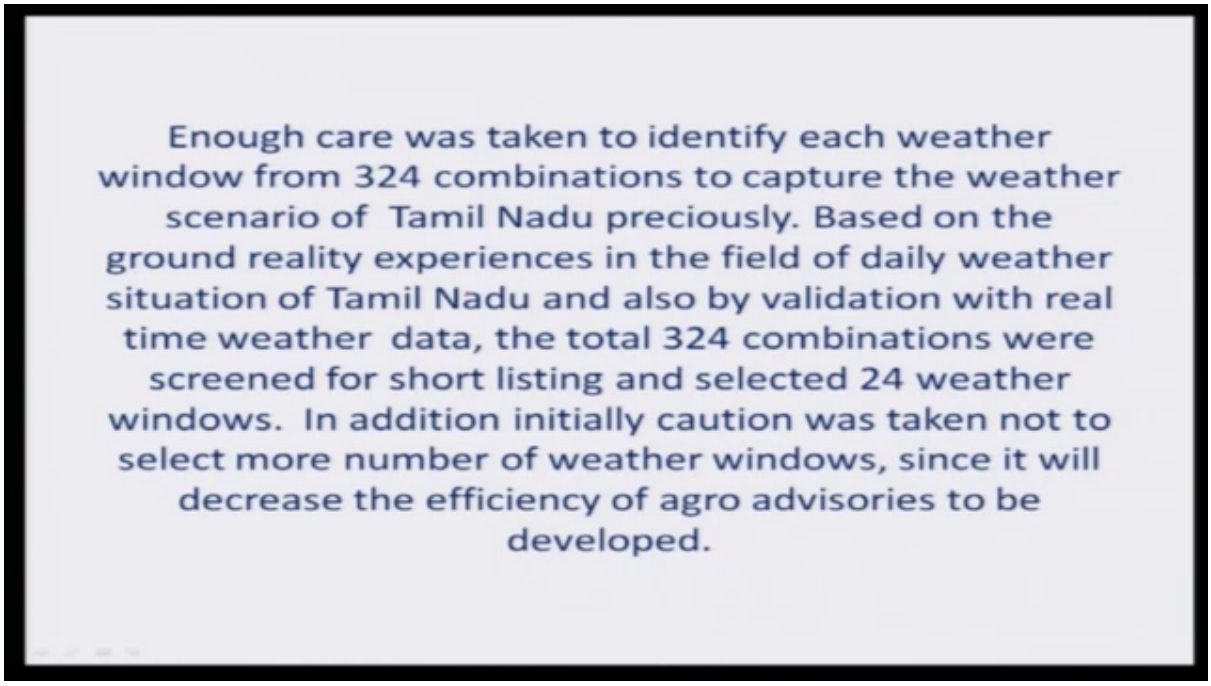

So after arriving these 324 weather windows if you select all means same, it may not be useful, it is very hard to use it on practical purposes. That's why what we did we selected and collected weather data from the Tamil Nadu Agricultural University of Meteorological Observatory and we validated. See, we have selected different weather elements for different over years and it was validated with the 324 weather windows now developed. We could see only 24 weather windows were found valid with a real-time data of the past years.

Then again we had exercise with the weather data from some other center and this was verified again. Then we felt that it is deficit to accommodate all the weather scenario so for Tamil Nadu. Then some re-exercise was done. We have selected another 30 from 324 combination already made and put it as 54, that is given in the next slide.

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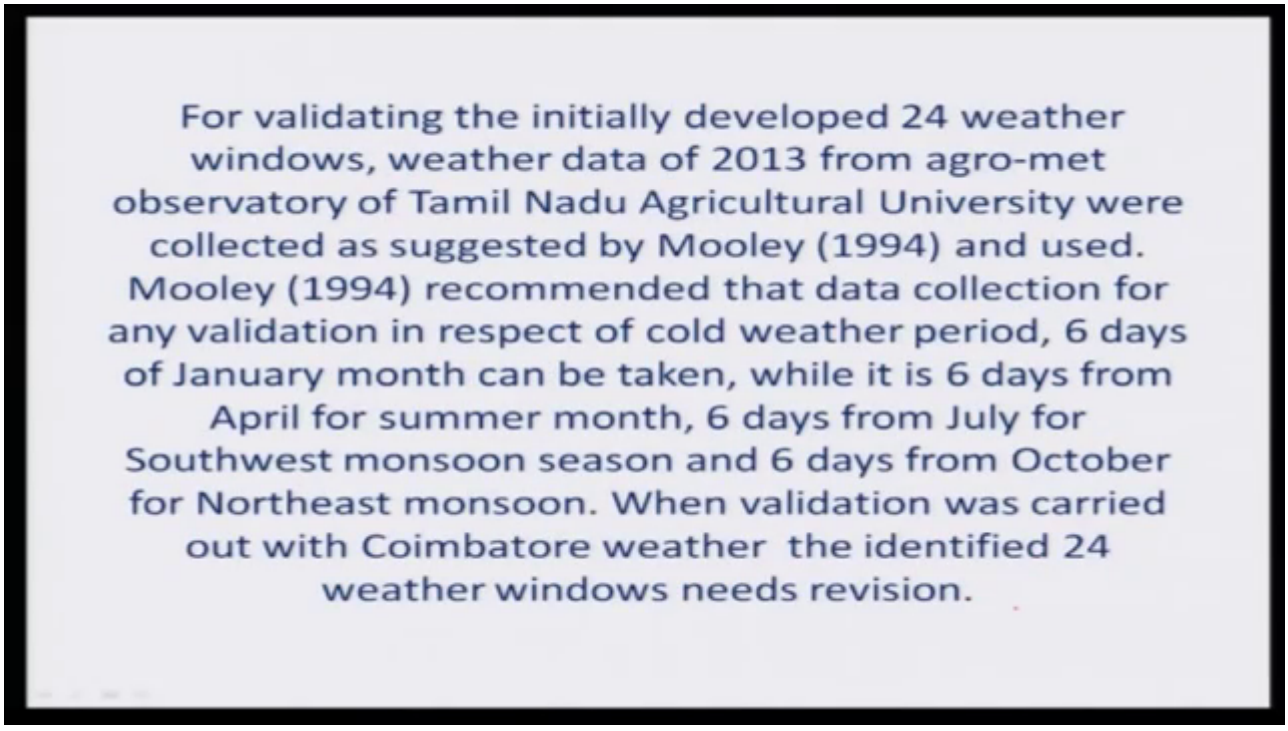

So the 54 weather window is now selected where validate with the block level data. In Tamil Nadu they have established automatic weather station in 385 blocks. So from each block, selected block we collected the weather data as per the recommendations given by Mooley 1994. That is these states were selected from January for cold weather period, April for your summer months, July for your southwest monsoon season and October for northeast monsoon season. So these six days weather data were validated with our 54 weather window and we found that our selected 54 weather windows were really good to accommodate all seasonal influence that occur in Tamil Nadu. Then we stop with that.

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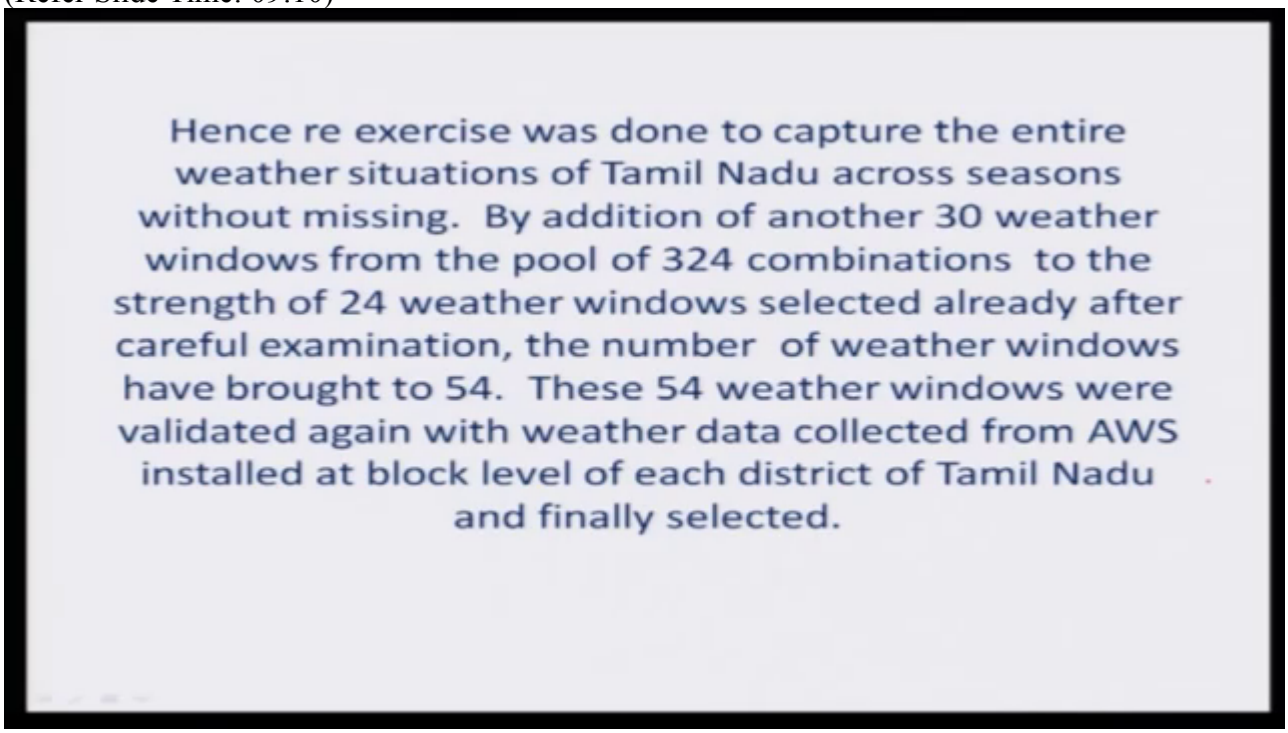

Then I like to show the 54 weather windows for your observations;

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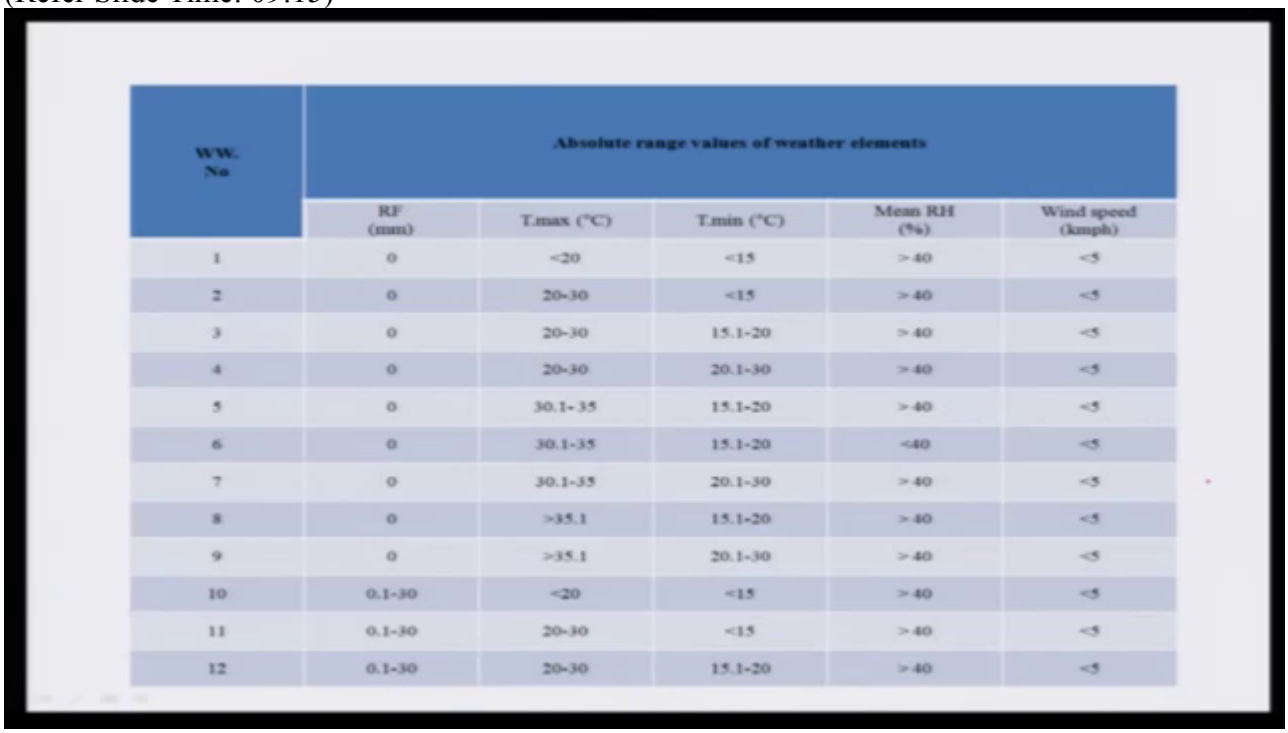

WW. No	Absolute range values of weather elements				
	RF (mm)	T.max (°C)	T.min (°C)	Mean RH (%)	Wind speed (kmph)
1	0	<20	<15	>40	<5
2	0	20-30	<15	>40	<5
3	0	20-30	15.1-20	>40	<5
4	0	20-30	20.1-30	>40	<5
5	0	30.1-35	15.1-20	>40	<5
6	0	30.1-35	15.1-20	<40	<5
7	0	30.1-35	20.1-30	>40	<5
8	0	>35.1	15.1-20	>40	<5
9	0	>35.1	20.1-30	>40	<5
10	0.1-30	<20	<15	>40	<5
11	0.1-30	20-30	<15	>40	<5
12	0.1-30	20-30	15.1-20	>40	<5

Weather window 1, rainfall zero, maximum temperature lesser than 20, minimum lesser than 20, mean RH greater than 40, wind speed is lesser than 5, like that we developed about 54 weather windows. Series weather windows would be able to accommodate all weather situation across seasons of Tamil Nadu. So this is a package, weather window package we have developed. This package will be feed into computer or your server specially meant to accommodate weather windows and this was done as a first step. So with this I complete this class. And we will continue the remaining in the next class.