Study on Desertification And Methods

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Abstract- *One of the most recent problems in world now a day is Grassland Desertification. In this study we are study on the methods by which you can find out the desertification on different period of time. In this study we are taking Yanchi County in China as a study area. The process of desertification in increasing day by day so we can use many methods to find out this desertification, so it can be prevented in future.*

Keywords- Landsat TM, TM+, Spectral Mixture, desertification, Decision-Tree Method

I. INTRODUCTION

Land degradation and desertification is one of the major problems facing by the China, effected factor Climate change and Human Factor. China took some serious action on this effect and it ban grazing and made grazing ban region. Grazing is a direct factor which indicates land degradation and desertification. In this study we use Spectral Mixture Analysis (SMA). It is recently most recommended and used and suitable method land desertification study. Therefore, by this method we intended to improve the monitoring capability to analyse the desertification map of Yanchi County in Ningxia.
Desertification: Desertification is a process in which the land of the area is converted from fertile soil to dry. In this process the soil of the area decreases the mineral and lack to fertile capability. Due to this problem the area is converting from forest to desert. It is a very slow process but it affects the plants and trees very fast.

Desertification is a major factor created by climate change and human induced processes. Atmosphere temperature is increasing day by day due to pollution and population. Water resources are decreasing regularly and the land become drier. Grazing is also a major problem by which desertification increases.

As we all know that china is one of the biggest countries in the world and has the biggest population too. We study a single area Yanchi County of Ningxia for the purpose of desertification bases on Landsat Image and Spectral Mixture Analysis. As we know China is Country which takes hard decision for the improvement of the country. To reduce desertification China ban grazing at some places.

Landsat TM: Thermal Mapper (TM) is a advance tool for scanning the image based on the sensor technique by which it provide high resolution of image and give a sharp spectral separation. It provide more accurate geometric fidelity and give better resolution the MSS sensor. It will give data which is sensed in 7 spectral bands at a time. The 6^{th} band sense thermal radiation or heat radiation so that, from 6^{th} band Landsat only acquire night scenes. TM sense 30m x 30m field of Earth at a time from 1-5 band and from 6^{th} and 7^{th} band it will sense 120m x 120m field.

TABLE 1- Band number and resolution of Landsat TM

Band Number	µm	Resolution
1	0.45-0.52	30 m
2	0.52-0.60	30 m
3	0.63-0.69	30 m
4	0.76-0.90	30 m
5	1.55-1.75	30 m
6	10.41-12.5	120 m
7	2.08-2.35	30 m

As we all know that 30% part of the Earth has surface and remaining part has water. In the 30% part 40% use as an agriculture land and on 60% human lives. As the temperature of Earth is increasing day by day, the agriculture land converting into deserts. We can take decision before any unusual situation happen by using Landsat TM. In this thesis Landsat will play a opener batsman for image sensing and help to find desertification for our study area Yanchi.

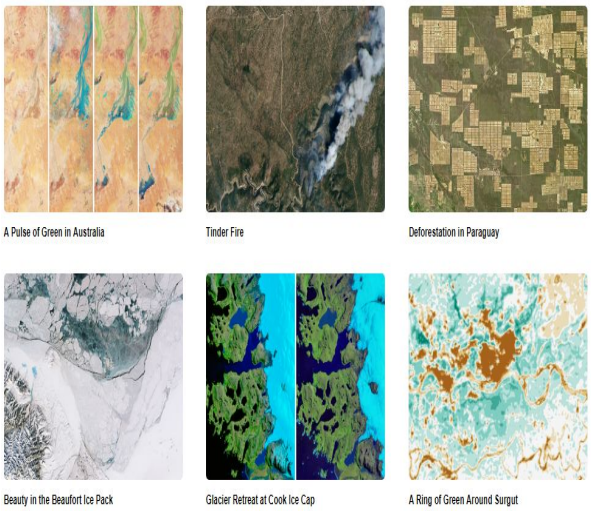

Fig 1.1- Image sensing by Landsat TM

II. SPECTRAL MIXTURE

Spectral Mixture is one of the best techniques by which we compare 2 images of same study are so that it can compare on the basis of pixels and it will calculate the image is of same area or not. It compare images on the basis of same pixels and will also tell the difference in images of same area but taken at different date and time.

This method help us to find, how fast the desertification happening in the study area and will also tell us this current desertification situation and the past desertification situation on the basis of image.

This method has two types

a) Pure Pixel – Pure pixel means it contains only single feature in the image.
b) Mixed Pixel – It means that it contains multiple features in an image. It is very difficult process to find the correct pixel and situation.

Difficulties in SMA (Spectral Mixture Analysis)

a) It will depend on pixels and each pixel give information about only a part of proportion
b) Brightness is effect on the pixel quality.
c) Any reflection cover the spectral area then pixel will differ.
d) Pixels have some measurable endmembers.

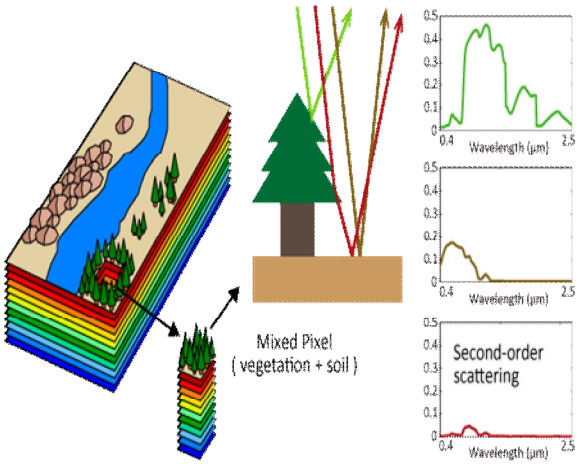

Fig 1.2- Spectral Mixture Analysis

Decision- Tree Method

Decision tree method is a graphical representation on each and every single decision outcome. With the help of this method we use to create graph of each discussion or decision. It can be drawn by program, hand or dedicated software. There are some decision tree software available and those are used in solve complex challenges in data mining.

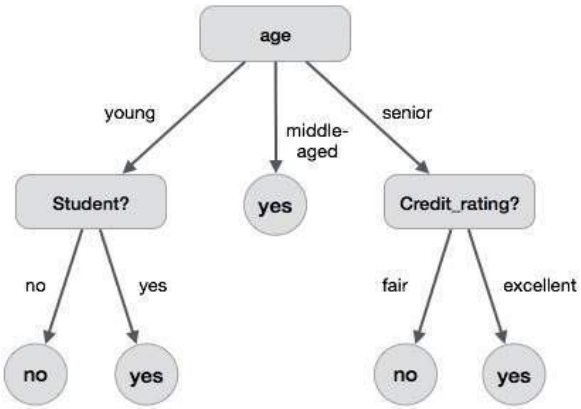

Fig 1.3- Decision -Tree method

III. SIMULATION & RESULT

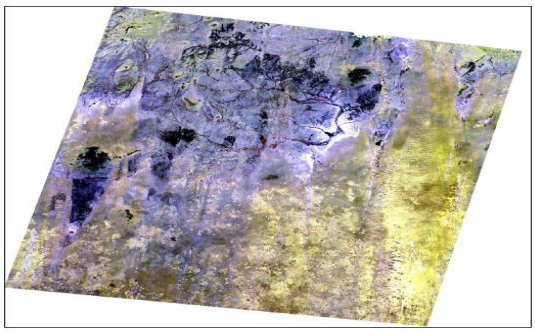

Fig 1.4- Landsat TM

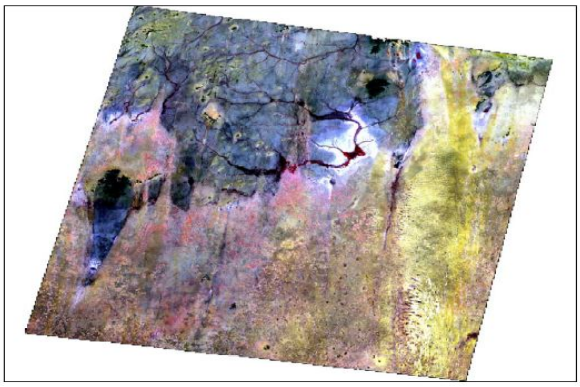

Fig1.5- Landsat TM+

IV. CONCLUSION

For dynamics of desertification in the study area, were analysed.

Monitoring desertification processes in the study area and its results can be generalized Statistical analysis of SMA results shows high significant regard to wind erosion maps the

desertified areas and proves the areas coupled with reduction in desertified areas from 2003 to 2011 compared to SMA results.

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